INFORMATION HANDOUT

For Contract No. 04-235624
At 04-SCl,SM-101-52.0/52.6,0.0/0.6

Identified by
Project ID 0400000678

PERMITS

U.S. Army Corp Permit, dated May 31, 2013

California Fish and Wildlife Permit, dated May 20, 2013

California Regional Water Quality Control Board Permit dated June 20, 2013

U.S. National Marine Fisheries Biological Opinion dated March 29, 2011

Cal-OSHA Tunnel Classification, dated May 9, 2013

WATER QUALITY

Water Quality Information Handout

MATERIALS INFORMATION

Final Foundation Report for San Francisquito Creek Bridge Replacement, Bridge No. 35-0348 dated April 2, 2013

Structures Final Hydraulic Report for San Francisquito Creek, Bridge No. 35-0348 dated November 7, 2014

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

REPLY TO
ATTENTION OF

MAY 31 2013

Regulatory Division

SUBJECT: File Number 2011-00088S

Mr. Jeffery Jensen
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Dear Mr. Jensen:

This correspondence is in reference to your submittal of July 7, 2011, concerning Department of the Army (DA) authorization to replace the San Francisquito Creek Bridge located at where U.S. 101 crosses San Francisquito Creek between the cities of Palo Alto and East Palo Alto, in San Mateo and Santa Clara Counties, California (37.45276, -122.12731).

Work within U.S. Army Corps of Engineers' (Corps) jurisdiction will include replacement of the bridge over San Francisquito Creek, widening the bridge to facilitate auxiliary lanes, and widening the creek channel to increase flow capacity to 100-year flood projections. Work will require replacement of the existing bridge and frontage roads with a new bridge that is 12 feet wider and 42 feet longer than the original bridge. To accommodate increased bridge length two existing pier walls will be replaced with three pier walls. Work will also include installation of cofferdams and a temporary water diversion pipe, demolition and removal of the existing bridge, excavation for abutments and installation of pier piles, installation of falsework and construction of bridge deck and pier walls, and installation of pile walls and modification of creek banks. Work will require the permanent placement of fill within 0.02 acre (261 linear feet) and will temporarily affect 0.93 acre (664 linear feet) of San Francisquito Creek. Work will also require the temporary placement of fill within 0.02 acre of wetlands associated with San Francisquito Creek. Widening of the stream channel is expected to result in an approximate 0.36 acre increase in waters of the U.S. All work shall be completed in accordance with the plans and drawings titled "*USACE File #2011-00088S, San Francisquito Creek Bridge Replacement, February 27, 2013, Figure 1 to 6*" (enclosure 1).

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

States; in former diked baylands currently below mean high water; outside the limits of mean high water but affecting the navigable capacity of tidal waters; or below the plane of ordinary high water in non-tidal waters designated as navigable waters of the United States. Navigable waters of the United States generally include all waters subject to the ebb and flow of the tide; and/or all waters presently used, or have been used in the past, or may be susceptible for future use to transport interstate or foreign commerce. A Preliminary JD has been completed for your site. Preliminary JDs are written indications that there may be waters of the U.S. on a parcel or indications of the approximate location(s) of waters of the U.S. on a parcel. Preliminary JDs are advisory in nature and may not be appealed.

Based on a review of the information in your submittal, and the current condition of the site, as verified during a field investigation on date January 7, 2013, the project qualifies for authorization under Department of the Army Nationwide Permit (NWP) 14 for Linear Transportation Projects, 77 Fed. Reg. 10,184, February 21, 2012, pursuant to Section 404 of the CWA of 1972, as amended (33 U.S.C. § 1344 *et seq.*) and Section 10 of the Rivers and Harbors Act (RHA) of 1899, as amended (33 U.S.C. § 403 *et seq.*). The project must be in compliance with the terms of the NWP, the general conditions of the Nationwide Permit Program, and the San Francisco District regional conditions cited in enclosure 2. You must also be in compliance with any special conditions specified in this letter for the NWP authorization to remain valid. Non-compliance with any term or condition could result in the revocation of the NWP authorization for your project, thereby requiring you to obtain an Individual Permit from the Corps. This NWP authorization does not obviate the need to obtain other State or local approvals required by law.

This verification will remain valid until March 18, 2017, unless the NWP authorization is modified, suspended, or revoked. Activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon a NWP will remain authorized provided the activity is completed within 12 months of the date of a NWP's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 C.F.R. § 330.4(e) and 33 C.F.R. §§ 330.5 (c) or (d). This verification will remain valid if, during the time period between now and March 18, 2017, the activity complies with any subsequent modification of the NWP authorization. The Chief of Engineers will periodically review NWPs and their conditions and will decide to either modify, reissue, or revoke the permits. If a NWP is not modified or reissued within five years of its effective date, it automatically expires and becomes null and void. It is incumbent upon you to remain informed of any changes to the NWPs. Changes to the NWPs would be announced by Public Notice posted on our website (http://www.spn.usace.army.mil/regulatory/index.html). Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance, enclosure 3, verifying that you have complied with the terms and conditions of the permit.

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

This Corps permit does not authorize you to take an endangered species, in particular the federally listed as threatened Central California Coast steelhead (*Oncorhynchus mykiss*) and the North American green sturgeon (*Acipencer medirostris*) or designated critical habitat for these species. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The enclosed National Marine Fisheries Service Biological Opinion (Service File Number 2010/06575, dated March 29, 2011), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological Opinion. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached Biological Opinion, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the Biological Opinion, where an "incidental take" of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The National Marine Fisheries Service is the appropriate authority to determine compliance with the terms and conditions of its Biological Opinion, and with the Endangered Species Act. The permittee must comply with all conditions of this Biological Opinion. If you are unable to comply with the terms and conditions, you must immediately notify Caltrans, the appropriate NMFS office, and the U.S. Army Corps of Engineers Regulatory office, so that Caltrans acting as the lead Federal agency for this project may consult as appropriate, prior to initiating the work, in accordance with Federal law.

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

1. To remain exempt from the prohibitions of Section 9 of the Endangered Species Act, the non-discretionary Terms and Conditions for incidental take of federally-listed Central California Coast steelhead (*Oncorhynchus mykiss*) and the North American green sturgeon (*Acipencer medirostris*) shall be fully implemented as stipulated in the Biological Opinion (pages 1- 42) dated March 29, 2011 (enclosure 4). Project authorization under the NWP is conditional upon compliance with the mandatory terms and conditions associated with incidental take. Failure to comply with the terms and conditions for incidental take, where a take of a federally-listed species occurs, would constitute an unauthorized take and non-compliance with the NWP authorization for your project. The NMFS is, however, the authoritative federal agency for determining compliance with the incidental take statement and for initiating appropriate enforcement actions or penalties under the Endangered Species Act.

2. Caltrans initiated consultation with the National Marine Fisheries Service (NMFS) to address project related impacts to Essential Fish Habitat. The conservation recommendations outlined in pages 1-5, in enclosure 5, shall be fully implemented as stipulated.

3. While temporary creek diversions are in place, appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable.

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

5. Temporary fills must be removed at the end of each construction season in their entirety. The area affected by temporary fills must be return to pre-construction elevations post-construction.

6. Within 1-year of initiation of temporary impact to a jurisdictional feature, you shall re-contour the temporarily impacted area and replant, any areas affected by temporary fills, above the Ordinary High Water Mark, with appropriate soil-stabilizing native species. If future de-watering would adversely affect these planting supplemental irrigation shall be provided.

7. In the event that you are unable to implement the plan described in special condition 6 within 1-year of initiation of temporary impact to a jurisdictional feature, you must purchase credits at a Corps approved mitigation bank to compensate for the temporary impact at a 3:1 ratio. If no approved bank or in-lieu fee is available, you shall propose an alternative mitigation plan to be reviewed and approved by the Corps.

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

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

Sincerely,

Jane M. Hicks
Chief, Regulatory Division

Enclosures

Copies Furnished (w/o encls):
CA RWQCB, Santa Rosa, CA
U.S. EPA, San Francisco, CA
CA SWRCB, Sacramento, CA
NMFS, Santa Rosa, Ca
CDFW, Yountville, Ca

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

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

May 20, 2013

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

Subject: Final Lake or Streambed Alteration Agreement
Notification No. 1600-2011-0270-3
Interstate 101, San Francisquito Creek Bridge Replacement

Dear Mr. Jensen:

Enclosed is the final Streambed Alteration Agreement ("Agreement") for the Interstate 101 San Francisquito Creek Bridge Replacement Project ("Project"). Before the Department may issue an Agreement, it must comply with the California Environmental Quality Act ("CEQA"). In this case, the Department, acting as a responsible agency, filed a notice of determination ("NOD") on May 20, 2013, based on information contained in the Negative Declaration, the lead agency prepared for the Project.

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

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

Sincerely,

Scott Wilson
Acting Regional Manager
Bay Delta Region

cc: Gregory Pera
California Department of Transportation

Lieutenant Joe
Lieutenant Nores
Warden Rodriguez
Melissa Escaron

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

STREAMBED ALTERATION AGREEMENT
NOTIFICATION NO. 1600-2011-0270-R3
San Francisquito Creek

CALIFORNIA DEPARTMENT OF TRANSPORTATION
SAN FRANCISQUITO CREEK BRIDGE REPLACEMENT PROJECT

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

RECITALS

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

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

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

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

PROJECT LOCATION

The project is located where Interstate 101 crosses the San Francisquito Creek, on the border of San Mateo and Santa Clara Counties, in the State of California;

PROJECT DESCRIPTION

Caltrans proposes to demolish the existing San Francisquito Creek Bridge and the two frontage road bridges and replace them with a new bridge (Project). The Project proposes to replace the existing 83-foot long by 232-foot wide San Francisquito Creek Bridge and two associated two-lane frontage roads. The new bridge structure will have 12 feet in additional width and 42 feet in additional length to accommodate the standard lane requirements of Route 101 and the anticipated flow capacity of San Francisquito Creek. The proposed bridge will be 125 feet long and 244 feet wide and will carry five lanes of traffic on Route 101 in each direction. San Francisquito Creek is a tidally influenced creek that discharges water into the southern end of the San Francisco Bay. There has been a lengthy history of flooding along the banks of the creek due to limited capacity. Sediment deposition along the channel has clogged the waterway directly underneath and adjacent to the bridge. During extreme storm events, water has overtopped the bridge. The San Francisquito Creek Joint Powers Authority (SFCJPA) has proposed improvements to the creek to improve flow capacity upstream and downstream from Route 101. Caltrans, in cooperation with the SFCJPA effort, proposes to improve the hydraulic capacity of the bridge structure to accommodate a 100-year creek flow event combined with a high-tide event. It is proposed that the creek be widened and the new bridge lengthened to the southeast towards Palo Alto and Santa Clara County. The increased bridge length will require the construction of three pier walls to replace the two existing pier walls. The frontage road bridges will sit on the same pier walls as the new San Francisquito Creek Bridge. One of the four bridge cells will remain closed off with soldier piles walls on both sides until the downstream and upstream channels are widened to match the wider dimensions of the new bridge. These improvements will be completed by the SFCJPA under a separate project. The downstream SFCJPA project may be constructed concurrently or prior to the proposed Project. Once the SFCJPA flood protection projects are completed, all of the soldier pile walls will be removed, and the fourth cell will become fully operational.

A temporary soldier pile wall 25 feet long will be constructed downstream of the San Francisquito Creek Bridge adjacent to the Yeaman's Auto Body Shop parcel. The wall will be constructed on what is currently the south bank of the creek. The creek bank will then be excavated to the face of the retaining wall which ties into the third pier wall south of the new bridge. Riprap will be placed and removed post construction by the SFCJPA when the creek expansion project opens the fourth cell of the San Francisquito Creek Bridge.

Two cofferdams will be constructed upstream and downstream of the work area. The cofferdams will be constructed with sheet metal or another appropriate material and will be approximately 6 feet high. The creek will be diverted through a 30-inch diameter corrugated steel pipe that spans 460 feet between the two cofferdams. During flow events the pipe will allow flow downstream through the construction site.

An excavator will be used to excavate soil for abutments, site preparation for pile installation, and to widen the channel. Timber pads will be laid down in the dewatered work area to support construction equipment. Approximately 200 pipe piles will be permanently installed. The piles will be approximately 80-90 feet long and 16 inches in diameter. The piles will be installed by pre-drilling 40 feet though the sand layer and then the piles will be driven into the mud layer. A pile driver will be used to drive 6 to 8 piles per day. Pile driving is estimated to take 30 work days and will occur 8 hours per day during the dry season. Falsework will be constructed and the pile cap, pier walls and bridge deck will be poured using a concrete pump truck and cement mixer. The existing bridge will be removed using mounted hydraulic jack hammer, excavator and dump trucks

The creek will be accessed via the south bank upstream and downstream of the bridge. All temporary items in the creek, including falsework, cofferdams, and the water diversion pipe will be removed at the end of each construction season. The contours of the creek will be restored, access ramps backfilled, and erosion control measures implemented to prevent erosion.

Project Schedule
The Bridge construction is expected to begin June 1' 2014, and be completed by October 15, 2016.

PROJECT IMPACTS

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

- Riparian habitat
- Central California Coastal Steelhead habitat
- North American green sturgeon habitat
- Aquatic invertebrates
- Bird nesting
- Western pond turtles and habitat
- Emergent wetland
- Bat Roosting

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

- Tree removal
- Temporary loss of natural bed and bank
- Temporary loss of riparian habitat
- Temporary degradation of salmonid and sturgeon habitat
- Water quality degradation
- Short-term release of contaminants
- Disruption of bat roosting

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures
Permittee shall meet each administrative requirement described below.

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

1.2 Providing Agreement to Persons at Project Site. This Agreement and any extensions or amendments shall be onsite at all times during Project activities.

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

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

2. Avoidance and Minimization Measures
To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below. These conditions apply to CDFW 1602 jurisdiction:

2.1 To minimize adverse impacts to fish and wildlife all work within the bed, bank, channel, and associated riparian habitat shall be confined to the period of June 1 to October 15. Revegetation work is not confined to this time period.

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

2.3 Prior to work commencing at the bridge site, the bridge shall be surveyed for bats by a Qualified Biologist. If bats are found bats shall not be disturbed without specific notice to and consultation with the CDFW. CDFW reserves the right provide additional provisions to this Agreement designed to protect bats.

2.4 Within 48 hours prior to construction, a Qualified Biologist shall conduct a wildlife survey, at the appropriate time of day, focusing on presence of Western pond turtle (*Clemmys marmorata*). If any Western pond turtles are found, a Qualified Biologist shall relocate the animal upstream of the project site in appropriate habitat.

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

2.6 The site shall be dewatered as necessary to provide an adequately dry work area. Corrugated metal pipes shall not be used the for water diversion. Pumps and siphons shall have double screens and mesh measuring 3/32 inches.

2.7 The Resident Engineer, or a designated representative, and a Qualified Biologist shall be onsite during dewatering and aquatic species relocation activities. All live steelhead and green sturgeon shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, and aerated water that is protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish shall not be removed from this water except when released. If necessary, a Qualified Biologist shall have at least two containers and segregate young-of-year salmonids from older salmonids and other potential aquatic predators in order to avoid predation effects. Captured steelhead and green sturgeon shall be relocated as soon as possible and will be give highest priority over other non-listed fish species. Water from the local collection site shall be used in live wells or other holding facilities during loading and transport. At no time shall chlorinated tap water be used. Water temperatures within any live well or other holding facility shall be kept at or below water temperature at the collection site. No non-native animals captured shall be returned to the stream or released alive. Both juvenile steelhead and green sturgeon shall be released downstream of the project area. Only a

Qualified Biologist with appropriate state and/or federal handling permits are permitted to handle state and/or federally listed species.

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

2.9 The perimeter of the work site shall be adequately fenced using high visibility Environmentally Sensitive Area (ESA) fencing to prevent damage to adjacent riparian habitat. No construction activities, within the riparian zone, will be allowed within the habitat protected by the ESA fencing (this does not preclude activities from occurring on the bridge or deck work above the ESA area).

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

2.11 Permittee shall salvage, stockpile, replace, and contour all wetland soils to the maximum extent practicable.

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

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

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

2.15 Permittee shall exclude concrete from receiving waters until concrete is fully cured. If groundwater comes into contact with uncured concrete, it shall be prevented from flowing towards receiving waters.

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

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

2.18 Permittee shall plan appropriately to ensure all work within DFG jurisdiction be completed by October 15 of each year.

3. Compensatory Measures

3.1 Oak tree removal shall be mitigated at a 5:1 removal to replacement ratio at the Pacheco Creek Mitigation Area in Santa Clara County. Replacement trees shall consist of 5-gallon saplings and shall be native species adapted to the lighting, soil and hydrological conditions at the replanting site. To ensure 80% survivorship at the end of 5 years, monitoring shall be conducted annually for a period of five years. If during the annual monitoring the plantings are not projected to meet 80% survivorship, Permittee is responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practices necessary to achieve 80% survivorship.

CONTACT INFORMATION

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

To Permittee:

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

To DFG:

Department of Fish and Game
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
Attn: Lake and Streambed Alteration Program – Melissa Escaron
Notification #1600-2011-0270-R3
mescaron@dfg.ca.gov

LIABILITY

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

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

SUSPENSION AND REVOCATION

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

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

ENFORCEMENT

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

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

OTHER LEGAL OBLIGATIONS

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

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

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

AMENDMENT

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

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

TRANSFER AND ASSIGNMENT

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

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

EXTENSIONS

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

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

EFFECTIVE DATE

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

TERM

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

AUTHORITY

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

AUTHORIZATION

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

CONCURRENCE

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

FOR CALIFORNIA DEPARTMENT OF TRANSPORTATION

Jeffrey G. Jensen — Date: 5/14/2013
Office Chief Biological Sciences and Permits

FOR DEPARTMENT OF FISH AND GAME

Scott Wilson — Date: May/20/2013
Acting Regional Manger

Prepared by: Melissa Escaron
Staff Environmental Scientist

Date Sent: October 29, 2012
February 8, 2013

May 3, 2013
May 13, 2013

FOR DEPARTMENT USE ONLY				
Date Received	*Amount Received*	*Amount Due*	*Date Complete*	*Notification No.*
7/29/11	$4482.75	$		1600-2011-0270-3

CAL TRANS
DEPT OF TRANS
STATE OF CA #082-939446

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

~~DELEON~~ Escalon
Lt. Flores
WN-Rodriguez

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

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

1. APPLICANT PROPOSING PROJECT

Fish & Game
JUL 29 2011
Yountville

Name	Mr. Ron Moriguchi		
Business/Agency	CALIFORNIA DEPARTMENT OF TRANSPORTATION, DISTRICT 4		
Street Address	111 GRAND AVENUE		
City, State, Zip	OAKLAND, CA 94612 P.O. Box 23660, Oakland, CA 94623		
Telephone	(510) 286-5073	Fax	(510) 286-4897
Email	Ron_Moriguchi@dot.ca.gov		

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

Name	Mr. John Yeakel		
Street Address	111 GRAND AVENUE		
City, State, Zip	OAKLAND, CA 94612		
Telephone	(510) 286-5681	Fax	
Email	John_Yeakel@dot.ca.gov		

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

Name			
Street Address			
City, State, Zip			
Telephone		Fax	
Email			

4. PROJECT NAME AND AGREEMENT TERM

A. Project Name	San Francisquito Creek Bridge Replacement at U.S. 101, (EA 04-235610, Br. # 35-0013)
B. Agreement Term Requested	☑ Regular (*5 years or less*) ☐ Long-term (*greater than 5 years*)

C. Project Term		D. Seasonal Work Period		E. Number of Work Days
Beginning (*year*)	Ending (*year*)	Start Date (*month/day*)	End Date (*month/day*)	
2013	2016	06/01	10/15	1,040.00

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

5. AGREEMENT TYPE

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

6. FEES

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

	A. Project	B. Project Cost	C. Project Fee
1	San Francisquito Creek Bridge Replacement at US Route 101	$9,320,000.00	$4,482.75
2			
3			
4			
5			
		D. Base Fee *(if applicable)*	
		E. TOTAL FEE ENCLOSED	$4,482.75

7. PRIOR NOTIFICATION OR ORDER

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

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

Applicant: ______ Notification Number: ______ Date: 7/25/11

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

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

☐ *Continued on additional page(s)*

8. PROJECT LOCATION

A. Address or description of project location.

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

The San Francisquito Bridge is located on U.S. 101 on the border between Santa Clara and San Mateo counties. San Francisquito Creek forms the border between the two counties and the city limits of Palo Alto to the south, and East Palo Alto and Menlo Park to the north. The project is located on U.S. 101 between the exits of University Ave. and Embarcadero Rd. To reach the project site by car take the Embarcadero Rd. exit, then turn east on Embarcadero Rd. and an immediate left onto East Bayshore Rd. which is a frontage road next to the U.S. 101. The San Francisquito Creek bridge is about 1/2 mile north of the E. Bayshore Rd./Embarcadero Rd. interchange. The bridge is approximately one mile away from the mouth of San Francisquito Creek and San Francisco Bay. The project site elevation is from 0 to 20 ft above sea level. Figure 1 (attached) shows the location of the project.

☐ *Continued on additional page(s)*

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

F. USGS 7.5 Minute Quad Map Name	G. Township	H. Range	I. Section	J. ¼ Section
Palo Alto and Mountain View	5S	3W	NA	NA

☐ *Continued on additional page(s)*

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

L. Assessor's Parcel Number(s)

NA

☐ *Continued on additional page(s)*

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

Latitude/Longitude	*Latitude:* 37.452793		*Longitude:* -122.127853	
	☐ Degrees/Minutes/Seconds	☑ Decimal Degrees	☐ Decimal Minutes	
UTM	*Easting:*	*Northing:*	☐ Zone 10 ☐ Zone 11	
Datum used for Latitude/Longitude or UTM	☐ NAD 27	☑ NAD 83 or WGS 84		

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

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

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

10. PROJECT DESCRIPTION

A. Describe the project in detail. Photographs of the project location and immediate surrounding area should be included.
- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
- Specify the type and volume of materials that will be used.
- If water will be diverted or drafted, specify the purpose or use.

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

The proposed project involves demolishing the existing San Francisquito Creek Bridge and the associated frontage road bridges and replacing them with a new bridge that is 14 feet wider and 43 feet longer than the original bridges. The bridge will be constructed to satisfy the lane requirements of the 101 Auxiliary Lanes Project and the flow capacity of the creek. The proposed bridge will be lengthened by 43 feet to allow for an increase in creek flow based on 100-year flood projections and also to facilitate projects proposed by the San Francisquito Creek Joint Powers Authority (SFJPA) that will widen the creek channel to increase the flow capacity of San Francisquito Creek and reduce flooding. The added length to the bridge will require the construction of three pier walls to replace the two existing pier walls. In addition, the freeway profile on each side of the bridge will be modified to conform to the new bridge deck, and the soundwall location on the bridge will be shifted to conform to the wider roadway. One of the four bridge cells will remain closed until the SFJPA downstream improvement project is completed.

☑ *Continued on additional page(s)*

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

Backhoes, excavators, bucket loaders, dump trucks, concrete mixers, concrete pump truck, pavers, drill rig, crane, compactors, hydraulic jackhammers, pile drivers, access ramps and temporary falsework

☐ *Continued on additional page(s)*

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

11. PROJECT IMPACTS

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

The project will have permanent and temporary impacts to San Francisquito Creek, a channelized tidally influenced perennial stream. The proposed project will permanently impact 0.024 acre of the waters of San Francisquito Creek and 0.011 acre of estuarine wetlands along the banks of the creek. Temporary impacts include approximately 0.933 acre of the waters of San Francisquito Creek and 0.011 acre of estuarine wetlands. The length, acreage and type of fill are in the attachment.

☑ *Continued on additional page(s)*

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

Vegetation Type	Temporary Impact	Permanent Impact
See attached table in supplement	Linear feet: ______ Total area: ______	Linear feet: ______ Total area: ______
	Linear feet: ______ Total area: ______	Linear feet: ______ Total area: ______

Tree Species	Number of Trees to be Removed	Trunk Diameter (range)
Tree of Heaven (Ailanthus altissima)	2	5-13 inches
Coast Live Oak (Quercus agrifolia)	1	approximately 40 inches
Lombardi Poplar	2	5-8 inches

☐ *Continued on additional page(s)*

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

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

Project site provides potential habitat for Central California Coast steelhead, and green sturgeon.

☑ *Continued on additional page(s)*

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

Natural Environment Study, Biological Assessment (Attachment 3), Biological Opinion (Attachment 4)

☐ *Continued on additional page(s)*

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

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

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

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

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

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

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

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

Construction and bridge replacement activities are planned to occur from June 1 and October 15 when creek flows are minimal, to comply with regulatory requirements, minimize potential discharge of sediment into the creek and to avoid any work in the creek when steelhead are likely to be migrating through the project area. Caltrans will employ best management practices (BMPs) to prevent sediment and other pollutants entering the creek. Where working areas encroach on the creek or instream wetlands, RWQCB-approved physical barriers adequate to prevent the flow or discharge of sediment into these systems shall be constructed and maintained between working areas and the creek or wetlands. No discharge of sediment into streams shall occur during construction of barriers.

☑ *Continued on additional page(s)*

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

The construction footprint has been minimized to the greatest extent feasible in order to accomplish the work. The construction schedule has been adjusted in order to complete instream project work within two dry season construction periods, if possible. Avoidance and Minimization measures are described in the attached supplemental document.

☑ *Continued on additional page(s)*

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

Compensatory mitigation may be necessary to offset permanent and temporary wetland losses. Compensation for impacts to jurisdictional waters of the U.S. may be provided through a combination of the following measures:
- Purchase of wetland creation credits from a mitigation bank approved by the USACE.
- Purchase of wetland preservation or enhancement credits from a USACE-approved mitigation bank.
- Off-site creation, restoration or enhancement of wetlands.
- On-site creation, restoration or enhancement of wetlands.
- As approved through negotiations with the USACE during the environmental permitting process.

(More information provided in supplement)

☑ *Continued on additional page(s)*

13. PERMITS

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

A. Clean Water Act Section 404 USACE Permit ☑ Applied ☐ Issued

B. RWQCB 401 Permit (Clean Water Certification) ☑ Applied ☐ Issued

C. ____________ ☐ Applied ☐ Issued

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

☐ *Continued on additional page(s)*

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

14. ENVIRONMENTAL REVIEW

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

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

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

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

B. State Clearinghouse Number (*if applicable*)	2011042065
C. Has a CEQA lead agency been determined?	☑ Yes (*Complete boxes D, E, and F*) ☐ No (*Skip to box 14.G*)
D. CEQA Lead Agency	Caltrans District 4
E. Contact Person	Tom Rosevear
F. Telephone Number	(510) 286-5360

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

This project is one component of the larger plan of constructing an auxiliary lane in each direction of U.S. 101 between Marsh Road in Menlo Park and Embarcadero Road in Palo Alto, CA.

☐ *Continued on additional page(s)*

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

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

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

15. SITE INSPECTION

Check one box only.

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

☑ I request the Department to first contact (*insert name*) Katie Thoreson (Associate Biologist, Caltrans) at (*insert telephone number*) (510) 286-6375 to schedule a date and time to enter the property where the project described in this notification will take place. I understand that this may delay the Department's determination as to whether a Lake or Streambed Alteration Agreement is required and/or the Department's issuance of a draft agreement pursuant to this notification.

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

16. DIGITAL FORMAT

Is any of the information included as part of the notification available in digital format (i.e., CD, DVD, etc.)?

☑ Yes (Please enclose the information via digital media with the completed notification form)

☐ No

17. SIGNATURE

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

Signature of Applicant or Applicant's Authorized Representative

7/25/11
Date

RON MORIGUCHI
Print Name

June 12, 2013
CIWQS Place No. 793406

Sent via electronic mail--no hard copy to follow

California Department of Transportation
Attn: Ron Moriguchi
Ron_Moriguchi@dot.ca.gov
111 Grand Ave.
Oakland, CA 94612-3717

Subject: Water Quality Certification for the U.S. 101 San Francisquito Creek Bridge Replacement Project, Cities of Palo Alto and East Palo Alto, Santa Clara and San Mateo County

Department Project No.: EA 04-23562

Dear Mr. Moriguchi:

We have reviewed and hereby issue water quality certification (Certification) to the California Department of Transportation (Department) for the U.S. 101 San Francisquito Creek Bridge Replacement Project (Project). The Department is seeking a Nationwide Permit 14 for Linear Transportation Projects from the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act (33 U.S.C. § 1344). As such, the Department has applied to the San Francisco Bay Regional Water Quality Control Board (Water Board) for a Clean Water Act Section 401 water quality certification that the Project will not violate State water quality standards.

Project: The following project description was derived from application materials received by the Water Board on February 19, 2013 and supplemental information provided by the Department via email on May 17, May 31, June 5, and June 6, 2013.

The Department proposes removal and replacement of the bridge that carries U.S. 101, East Bayshore Road, and West Bayshore Road over San Francisquito Creek (Creek). The existing bridge is structurally deteriorated and lacks hydraulic capacity, which contributes to flooding along the Creek. The replacement bridge will be wider than the existing bridge to provide standard lane and shoulder widths on U.S. 101, and longer than the existing bridge to accommodate a 100-year Creek flow event combined with a 100-year high tide event. The Project is planned in conjunction with projects by the San Francisquito Creek Joint Powers Authority (SFCJPA) to increase hydraulic capacity in the Creek downstream and upstream of U.S. 101. The Project is expected to take three years to complete and will be staged to minimize traffic impacts.

Project elements include:

- Temporary diversion of the Creek each year between June 1 and October 15. Creek diversion will be accomplished by constructing sheet pile cofferdams and a installing a 30” diversion pipe to allow water to pass through the work area.

- Installation of access ramps to allow equipment to access the Creek for construction of cofferdams and bridge demolition and construction.

- Demolition and removal of the existing bridge which consists of two pier walls and three spans.

- Installation of approximately 200 - 16 inch diameter pier piles.

- Installation of falsework and construction of a new bridge composed of three pier walls and four spans. Creek flow through the fourth span will be blocked on both sides by soldier pile walls until the downstream channel widening project by the SFCJPA is completed.

- Placement of rock slope protection along the channel bed at the base of the soldier pile wall. Rock slope protection will be removed as part of the SFCJPA project.

- Dewatering of stormwater and groundwater from the project site.

Impacts: Project implementation would permanently impact approximately 0.05 acre (286 linear feet) of San Francisquito Creek, and two coast live oak trees. Permanent impact to the Creek would result from construction of three concrete bents to support the bridge deck and additional shading caused by a larger bridge footprint. Permanent impact to oak trees would result from roadway and bridge abutment construction which would compromise the root structure of the trees.

Project implementation would temporarily impact approximately 0.02 acre of estuarine wetland, 0.93 acres (527 linear feet) of San Francisquito Creek and 0.092 acre of riparian vegetation. Temporary impacts will result from demolition and construction of the bridge and temporary diversion of the Creek.

See Attachment for impact locations and maps.

Roadway Pollutant Impacts: Project implementation would result in approximately 0.26 acres of new and 0.44 acres of reworked impervious area. Stormwater runoff from impervious areas may contain hydrocarbons, metals, volatile organic compounds, trash, and sediment at levels that may significantly impact waters of the State if left untreated.

Hydromodification Impacts: Added impervious areas may result in alterations to existing hydrologic regimes, resulting in erosion and/or changes of sediment transport in receiving waters (hydromodification). Because added impervious area for the project will result in a minimal increase in stormwater runoff, and the project area discharges to San Francisquito Creek, which is tidally influenced, hydromodification mitigation is not required for this Project.

Avoidance and Minimization: The Department has avoided and minimized impacts to San Francisquito Creek, wetlands, and riparian vegetation by: utilizing a closed bypass pipe to temporarily divert the Creek at the suggestion of the National Marine Fisheries Service; utilizing a timber mat and plywood (or equivalent) system to protect the Creek from demolition debris; using sediment and erosion control best management practices; and performing construction and demolition activities in the Creek between June 1 and October 15 when flows are minimal.

Mitigation: To mitigate for permanent impacts to riparian vegetation, the Department shall plant 10 oak trees at the Pacheco Creek Mitigation Area in Santa Clara County (see Certification Condition no. 2).

To mitigate for temporary impacts to San Francisquito Creek and estuarine wetlands, the Department shall remove all non-native materials used for bridge construction and temporary creek bypass, that are not part of the permanent bridge structure at the end of each construction season. The Creek shall be restored to original elevations and contours, except in the areas where it will be widened to increase hydraulic capacity. Widening of the Creek shall result in approximately 0.34 acres in increased Creek area within the project limits.

Roadway Pollutant Mitigation: As mitigation for increased pollutant loads associated with approximately 0.70 acre of added and reworked impervious area for this Project, the Department shall construct two biofiltration swales to treat stormwater runoff (see Certification Condition no. 1). The biofiltration swales shall be located in the northbound and southbound entrance loops from Embarcadero Road to U.S. 101 (see Attachment for location map and details). Bioswale 1, located in the southbound loop, shall be sized to treat approximately 0.498 acre of impervious area. Bioswale 2, located in the northbound loop, shall be sized to treat approximately 0.222 acre of impervious area.

CEQA Compliance: The Department evaluated the Project pursuant to the requirements of the California Environmental Quality Act (CEQA) in a Negative Declaration. The Department filed a Notice of Determination on March 19, 2012 that the Project would not have a significant effect on the environment (SCH No. 2011042065).

California Wetlands Portal: It has been determined through regional, state, and national studies that tracking of mitigation/restoration projects must be improved to better assess the performance of these projects. In addition, to effectively carry out the State's No Net Loss Policy for wetlands, the State needs to closely track wetland losses, gains, and mitigation/restoration project success. Therefore, we require the Department use the California Wetlands Standard Form to provide Project information related to impacts and mitigation/restoration measures (see Condition nos. 3 and 4 of this Certification). An electronic copy of the form and instructions may be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml

Project information concerning impacts and mitigation/restoration will be made available at the web link: http://www.californiawetlands.net

Certification: I hereby issue an order certifying that any discharge from the referenced Project will comply with the applicable provisions of sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, and with other applicable requirements of State law. This discharge is also regulated under State Water Resources Control Board Order No. 2003 - 0017 – DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification" which requires compliance with all conditions of this Certification. The following conditions are associated with this Certification:

1. As mitigation for increased pollutant loads associated with impervious surface added and reworked with the Project, the Department shall provide treatment of stormwater runoff from no less than 0.70 acre of impervious area using biofiltration swales. The biofiltration swales shall be installed concurrently with this Project and be consistent with the plans in the Attachment of this Certification. Any revisions to the biofiltration swale design details shall be subject to the acceptance of Water Board staff.

2. To compensate for the removal of two coast live oak trees, the Department shall:

    a. Plant no less than 10 oak trees at Pacheco Creek Mitigation Area in Santa Clara County, CA;

b. Only deem oak tree plantings successful after ten growing seasons, whereupon eighty percent of the planted oaks shall exhibit average or improved health and vigor from the previous two growing seasons;

c. Provide additional planting, maintenance and monitoring until the success criteria is satisfied if the above success criteria is not met;

d. Submit monitoring reports to the Water Board by January 1 for years 1, 2, 3, 5, 7, and 10. All monitoring reports shall include photo-documentation utilizing consistent photo vantage points. At the end of year 10, a comprehensive final report shall be prepared that includes summaries of the monitoring data, representative photos, and maps.

3. The Department is required to use the California Wetlands Standard Form to provide project information describing impacts and mitigation/restoration measures within 14 days from the date of this Certification. An electronic copy of the form can be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. The completed California Wetlands form shall be submitted electronically to habitatdata@waterboards.ca.gov or shall be submitted as a hard copy to both: 1) The Water Board, 1515 Clay St., Suite 1400, Oakland, CA 94612, to the attention of California Wetlands Portal; and 2) San Francisco Estuary Institute, 4911 Central Ave., Richmond, CA 94804, to the attention of California Wetlands Portal;

4. Mitigation and monitoring reports shall be submitted to the Water Board by January 1 of each year. Modification of this deadline is subject to the acceptance of Water Board staff. The reports may be submitted by upload to the California Wetlands Portal website at http://www.californiawetlands.net/tracker/ba/list. Select San Francisquito Bridge Replacement Project from the Bay Area Project List and then use the “Files & Links” web-link on the mitigation site project page to upload the report. The Department shall immediately notify appropriate Water Board staff once the monitoring report has been uploaded. If the Department cannot, or chooses not to submit the report using the California Wetlands Portal, the report may be submitted directly to Water Board staff electronically, via e-mail;

5. All temporarily disturbed areas above the ordinary high water mark shall be re-vegetated using only native plant species. The Department shall not cause, through operation of heavy machinery, or any other construction activity, compaction of marshes or open waters in areas of temporary impact. Any compaction of marshes or open waters in areas of temporary impact shall require mitigation;

6. The Resident Engineer (or appropriately authorized agent) shall hold onsite water quality permit compliance meetings (similar to tailgate safety meetings) to discuss permit compliance, including instructions on violation avoidance and violation reporting procedures. The meetings shall be held at least every other week, before forecasted storm events, and when a new contractor or subcontractor arrives to begin

work at the site. The contractors, subcontractors and their employees, as well as any inspectors or monitors assigned to the Project, shall be present at the meetings. The Department shall maintain dated sign-in sheets for attendees at these meetings, and shall make them available to the Water Board on request;

7. Concrete shall be excluded from surface water for a period of 30 days after it is poured/sprayed. During that time the concrete shall be kept moist and runoff from the concrete shall not be allowed to enter State waters. Commercial sealants may be applied to the concrete surface in instances where 30 days of water exclusion is infeasible. If sealant is used, water shall be excluded from the site until the sealant is cured. If groundwater comes into contact with fresh concrete, it shall be prevented from flowing towards surface water;

8. The Project shall be constructed in conformance with the Project Description described in this Certification and certification application materials. Any change in the Project that could impact State waters may require compensatory mitigation and shall first be reported to and found acceptable by the Water Board Executive Officer;

9. If, at any time, an unauthorized discharge to surface water (including wetlands, rivers or streams) occurs, or any other water quality problem arises, the associated Project activities shall immediately cease until adequate BMPs are implemented. The Water Board shall be notified promptly within 24 hours after the unauthorized discharge or water quality problem arises;

10. The Department shall adhere to the conditions imposed by Nationwide Permit 14 for Linear Transportation Projects issued to the Department by the U.S. Army Corps of Engineers, the Streambed Alteration Agreement issued to the Department by the California Department of Fish and Wildlife, and the Biological Opinion issued by the National Marine Fisheries Service;

11. All activities and best management practices (BMPs) shall be implemented according to the submitted application materials and the findings and conditions of this Certification. BMPs for erosion, sediment, turbidity and pollutant control shall be implemented and in place at commencement of, during, and after any ground clearing activities, construction activities, or any other Project activities that could result in erosion, sediment, or other pollutant discharges to waters of the State. The BMPs shall be implemented in accordance with the Caltrans Construction Site Best Management Practice Manual (CCSBMPM) and all contractors and subcontractors shall comply with the CCSBMPM. BMPs for erosion and sediment control shall be utilized throughout all phases of construction, regardless of date, wherever sediment-laden runoff threatens to enter waters of the State. The Department shall stage erosion and sediment control materials at the work site. All BMPs shall be installed properly and in accordance with the manufacturer's specifications. If the Project

Resident Engineer elects to install alternative BMPs for use on the project, the Department shall submit a proposal to Water Board staff for review and concurrence;

12. The Department shall not use or allow the use of erosion control products that contain synthetic materials within waters of the State at any time. The Department shall request approval from Water Board staff if an exception from this requirement is needed at a specific location. In upland and riparian areas, the Department shall prioritize the use of wildlife-friendly biodegradable (not photo-degradable) erosion control products. The Department shall not use or allow the use of erosion control products that contain synthetic netting for permanent erosion control (i.e. erosion control materials to be left in place for two years or after the completion date of the Project).

    If the Department finds that erosion control netting or products have entrapped or harmed wildlife, personnel shall remove the netting or product and replace it with wildlife-friendly biodegradable products;

13. Fueling, lubrication, maintenance, storage and staging of vehicles and equipment shall be prohibited within waters of the State. Fueling of individual equipment types within waters of the State may be authorized if the Department first prepares a fueling plan that:
    a. Identifies the specific piece of machinery that may require fueling within waters of the State;
    b. Provides justification for the need to refuel within State waters. The justification shall describe why fueling outside of jurisdictional waters is infeasible; and
    c. Includes a narrative of specific BMPs that shall be employed to prevent and capture fuel releases.

    Fueling of equipment within waters of the State shall be prohibited until the above mentioned plan has been approved by Water Board staff. The fueling plan may be submitted individually, included in the project Storm Water Pollution Prevention Plan (SWPPP), or submitted as a SWPPP amendment.

14. Fueling, lubrication, maintenance, storage and staging of vehicles and equipment shall not result in a discharge or a threatened discharge to any waters of the State. At no time shall the Department use any vehicle or equipment which leaks any substance that may impact water quality;

15. Except as expressly allowed in this Certification, the Department is prohibited from discharging waste to waters of the State. No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or concrete washings, welding slag, oil or petroleum products, or other organic or earthen material from any construction or

associated activity of whatever nature, other than that authorized by this Certification, shall be allowed to enter into waters of the State. Except for temporary stockpiling of waste generated during demolition operations ("temporary" in this instance means generated and removed during the same working day), waste materials shall not be placed where the materials may be washed by rainfall into waters of the State;

16. The Department shall provide analysis and verification that placement of non-hazardous waste or inert materials (which may include discarded product or recycled materials) will not result in degradation of water quality, human health, or the environment. All Project-generated waste shall be handled, transported, and disposed in strict compliance with all applicable State and Federal laws and regulations. When construction is complete, any excess material or debris shall be removed from the work area and disposed of properly and in accordance with the State and Federal laws and regulations, the Department is liable and responsible for the proper disposal of waste generated by their Project;

17. All imported fill material shall be clean and free of pollutants. All fill material shall be imported from a source that has the appropriate environmental clearances and permits. The reuse of low-level contaminated solids as fill onsite shall be performed in accordance with all State and Federal policies and established guidelines; a plan for such re-use must first be submitted to Water Board staff for review and concurrence;

18. Work in flowing or standing surface waters is prohibited;

19. Caltrans shall submit, subject to the acceptance of Water Board staff, a dewatering and/or diversion plan that appropriately describes the dewatered or diverted areas and how those areas will be handled during construction. The diversion/dewatering plans shall be submitted no later than 30 days prior to conducting the proposed activity. Diversion/dewatering activities shall be prohibited until Water Board staff has accepted the dewatering/diversion plan for that specific water. Information submitted shall include the area or work to be diverted or dewatered and method of the proposed activity. All diversion or dewatering activities shall be designed to minimize the impact to waters of the State, avoid fish entrainment, and maintain natural flows upstream and downstream. All dewatering or diversion structures shall be installed in a manner that does not cause sedimentation, siltation or erosion upstream or downstream. All dewatering or diversion structures shall be removed immediately upon completion of Project activities;

20. This Certification does not allow for the take, or incidental take, of any special status species. The Department shall use the appropriate protocols, as approved by the California Department of Fish and Wildlife and the USFWS, to ensure that Project activities do not impact the Beneficial Use of the Preservation of Rare and Endangered Species, as described in the San Francisco Bay Regional Water Quality Control Plan;

21. The Department shall maintain a copy of this Certification at the Project site to be available at all times to Project personnel. It is the responsibility of the Department to assure that all personnel (employees, contractors, and subcontractors) are adequately informed and trained regarding the conditions of this Certification;

22. The Water Board may add to or modify the conditions of this Certification, as appropriate, to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act;

23. This Certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section 13330 of the California Water Code and Title 23 of the California Code of Regulations, Section 3867;

24. This Certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license, unless the pertinent certification application was filed pursuant to California Code of Regulations Title 23, Subsection 3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought; and

25. This Certification is conditioned upon total payment of the full fee required in State regulations (23 CCR Section 3833). The Water Board has received the full fee for this Certification.

We anticipate your cooperation in implementing these conditions. However, please be advised that any violation of water quality certification conditions is a violation of State law and subject to administrative civil liability pursuant to California Water Code, Section 13350. Failure to respond, inadequate response, late response, or failure to meet any condition of this Certification may subject you to civil liability imposed by the Water Board to a maximum of $5,000 per day per violation or $10 for each gallon of waste discharged in violation of this Certification.

This Certification includes requirements for information and reports. Any requirement for a report made as a condition to this action is a formal requirement pursuant to CWC section 13267, and failure or refusal to provide, or falsification of such required report is subject to civil liability as described in California Water Code, Section 13268.

If you have any question, please contact Derek Beauduy at (510) 622-2348, or via e-mail to DBeauduy@waterboards.ca.gov.

Sincerely,

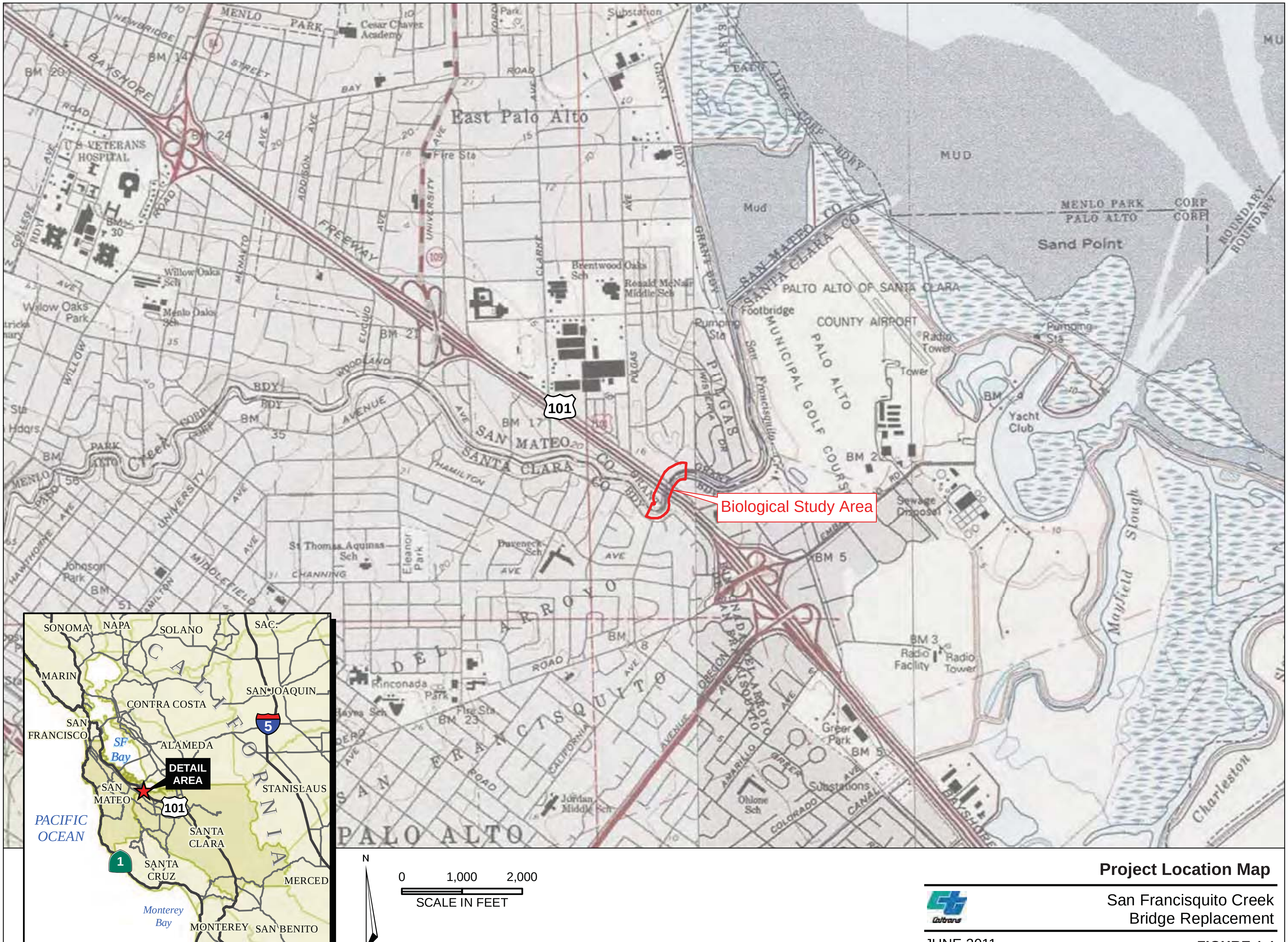
Bruce H. Wolfe
Executive Officer

Attachment

cc (via e-mail):
Mr. Bill Orme SWRCB-DWQ
Mr. Cameron Johnson, USACE
Ms. Jane Hicks, Regulatory Branch, USACE
Ms. Melissa Escaron, CDFW
Ms. Paula Gill, USACE
Mr. Ryan Olah, USFWS
Mr. Dale Bowyer, Water Board
Mr. Cyrus Vafai, Caltrans
Mr. Hardeep Takhar, Caltrans
Mr. Jason Brush, USEPA
Mr. Wilfung Martono, Caltrans

Attachment

Project Maps, Plans, and Details



N

0 1,000 2,000
SCALE IN FEET

Project Location Map

San Francisquito Creek
Bridge Replacement

JUNE 2011

FIGURE 1-1

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

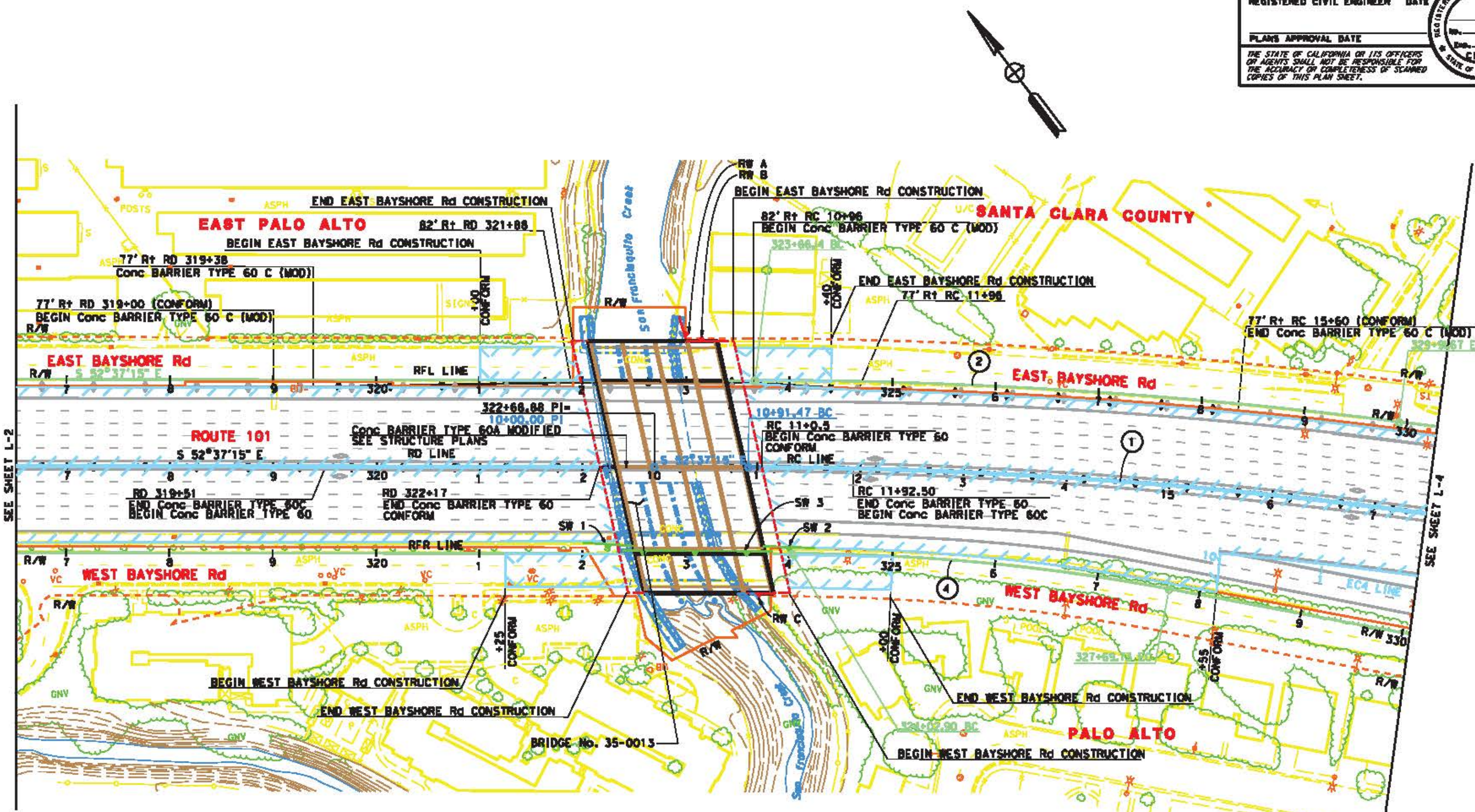
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA



CURVE DATA

No. ◉	R	Δ	T	L	N	E
1	4984'	13°41'45"	598.53'	1191.36'	1987432.90	6086213.90
2	5000'	7°10'05"	313.17'	625.53'	1987483.42	6086259.78
3	260'	42°38'42"	101.49'	193.52'	1990715.85	6090474.13
4	2000'	10°30'32"	183.93'	366.83'	1989711.54	6088008.28
5	500'	42°43'40"	195.59'	372.87'	1990269.33	6089526.04

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

SAN FRANCISQUITO CREEK BRIDGE REPLACEMENT LAYOUT

SCALE: 1" = 50'

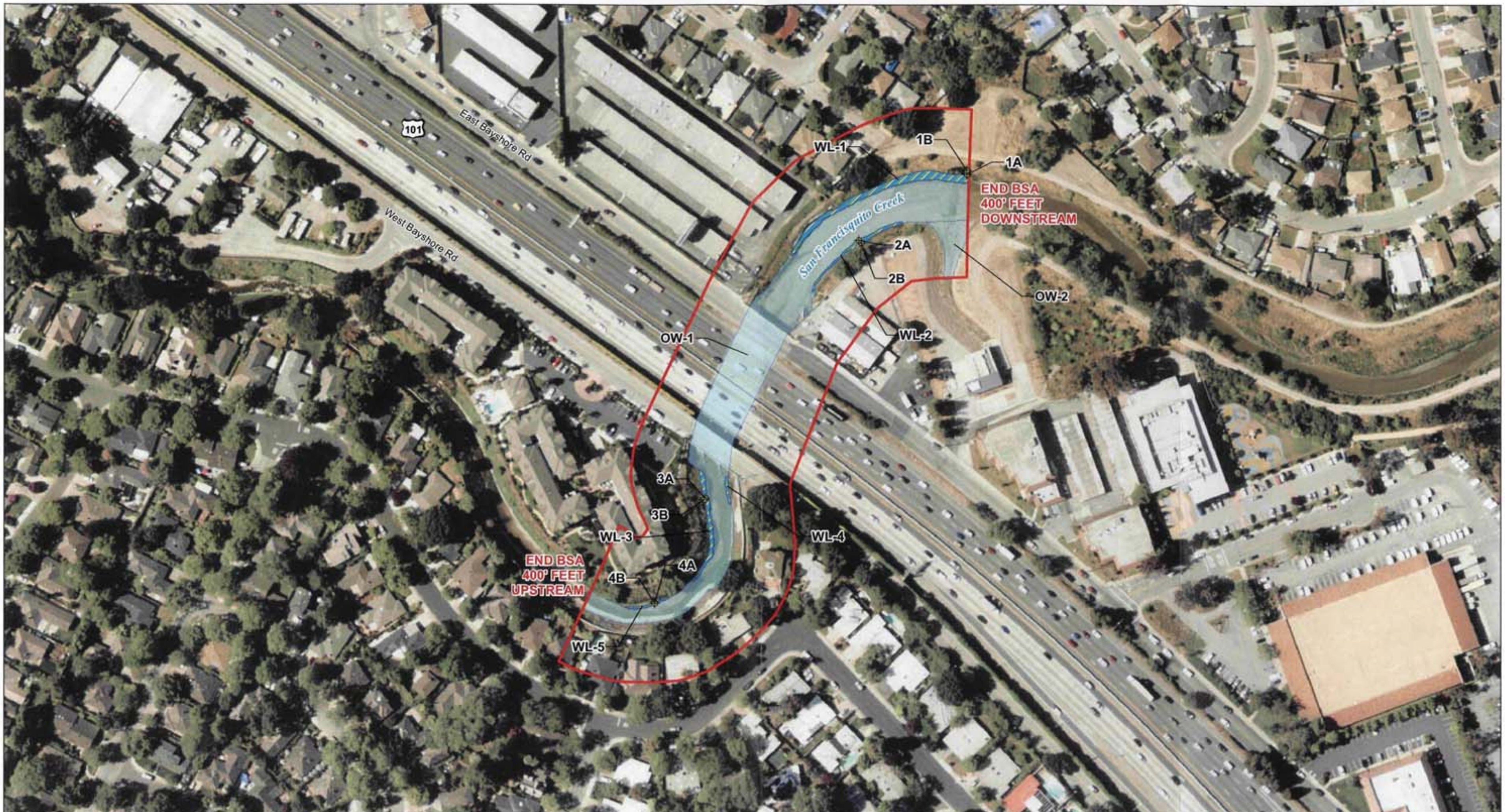
L-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

LAST REVISION 00-00-00 | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME

BORDER LAST REVISED 7/2/2010 | USERNAME => $USER | DGN FILE => $REQUEST | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE | 00000000001



Imagery source: DigitalGlobe ImageConnect Service, 4/1/2009

- Wetland Sampling Point
- Wetland
- Other Waters of the U.S.
- Biological Study Area

N

0 100 200

Feet

U.S. Army Corps of Engineers
San Francisco District, Regulatory Division
Preliminary Jurisdictional Determination

California Department of Transportation, District 4
San Francisquito Creek Bridge Replacement Project, Hwy 101
File no.: SPN-2011-00088 S Date: Mar. 23, 2011

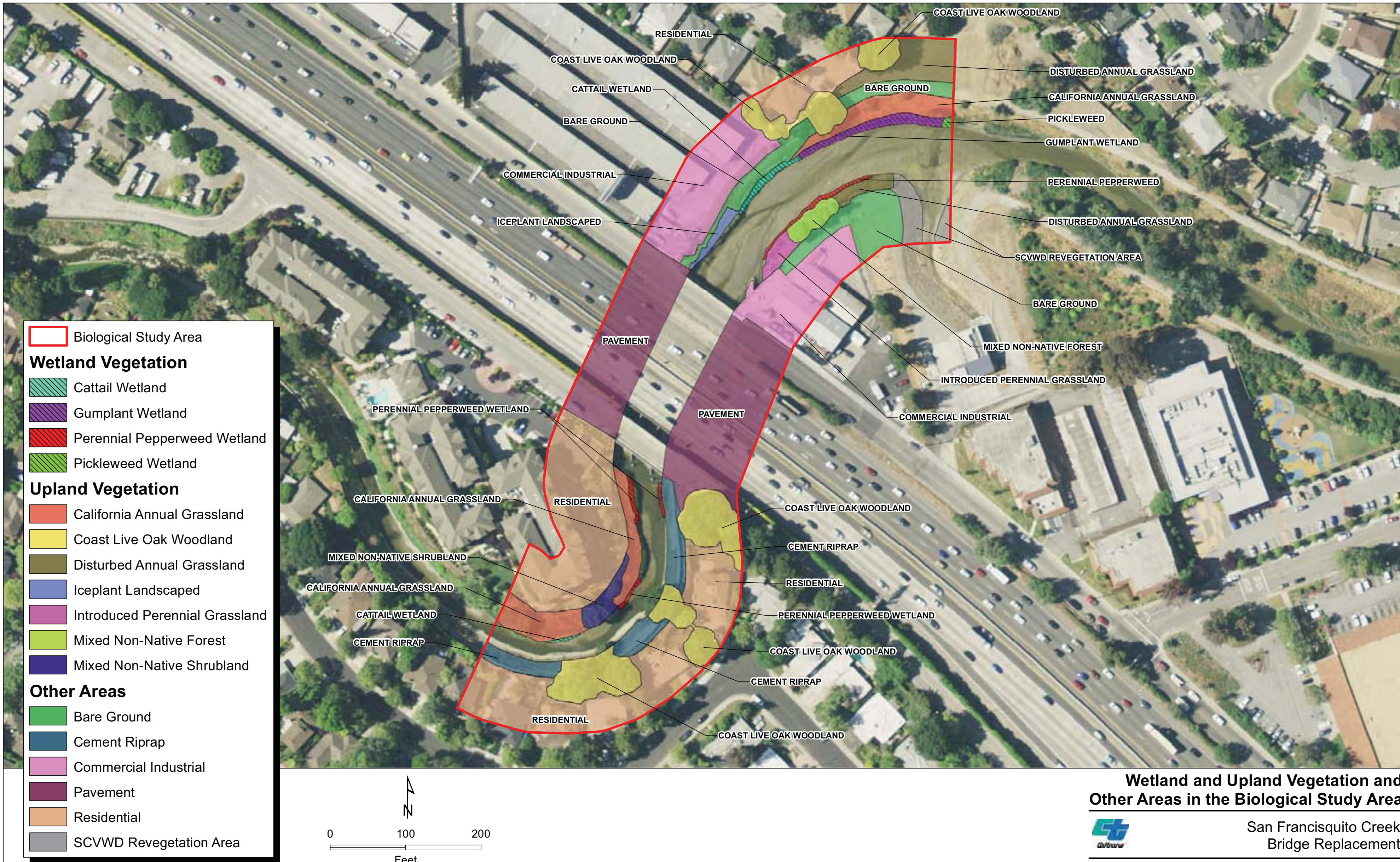
Potentially Jurisdictional Waters of the U.S. in the Biological Study Area

Caltrans

San Francisquito Creek
Bridge Replacement

FEBRUARY 2011

FIGURE 2-2

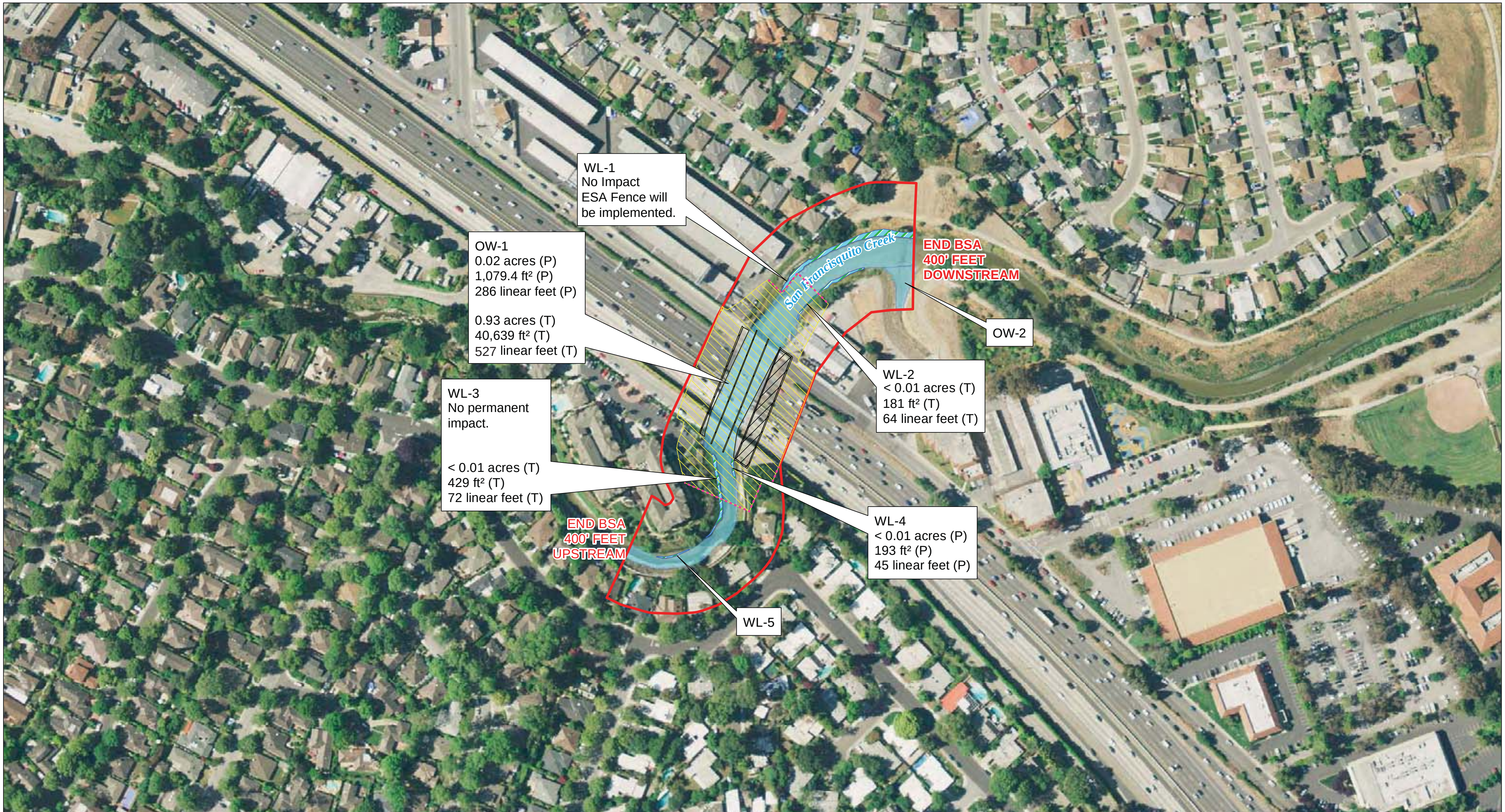


Wetland and Upland Vegetation and Other Areas in the Biological Study Area

San Francisquito Creek
Bridge Replacement

DECEMBER 2010

FIGURE 2-3



Biological Study Area
Permanent Impact
Temporary Impact
Wetland
Other Waters of the U.S.
ESA Fence

N

0 100 200
Feet

Total Impacts to Waters of the U.S.

	Permanent	Temporary
Wetlands:	0	0.02 acre (181 lf)
Other Waters:	0.02 acre (286 lf)	0.93 acre (527lf)

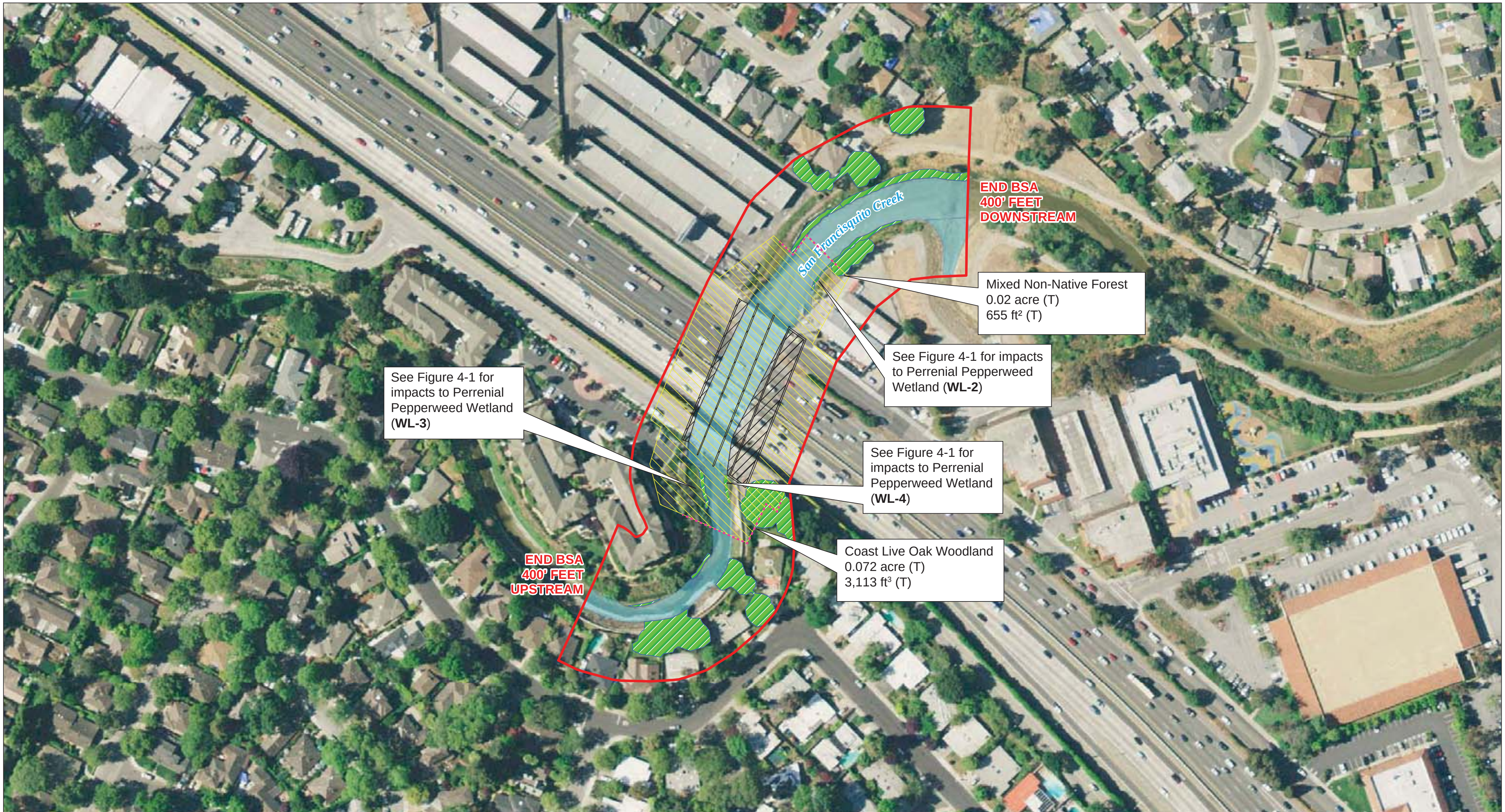
Impacts to Jurisdictional Waters of the U.S. in the Biological Study Area

San Francisquito Creek
Bridge Replacement

January 11, 2013

FIGURE 4-1

ES010213203335SAC



Biological Study Area
Permanent Impact
Temporary Impact
Riparian Vegetation
Water
ESA Fence

N

0 100 200
Feet

Impacts to Riparian Vegetation in the Biological Study Area

San Francisquito Creek Bridge Replacement

January 11, 2013

FIGURE 4-2

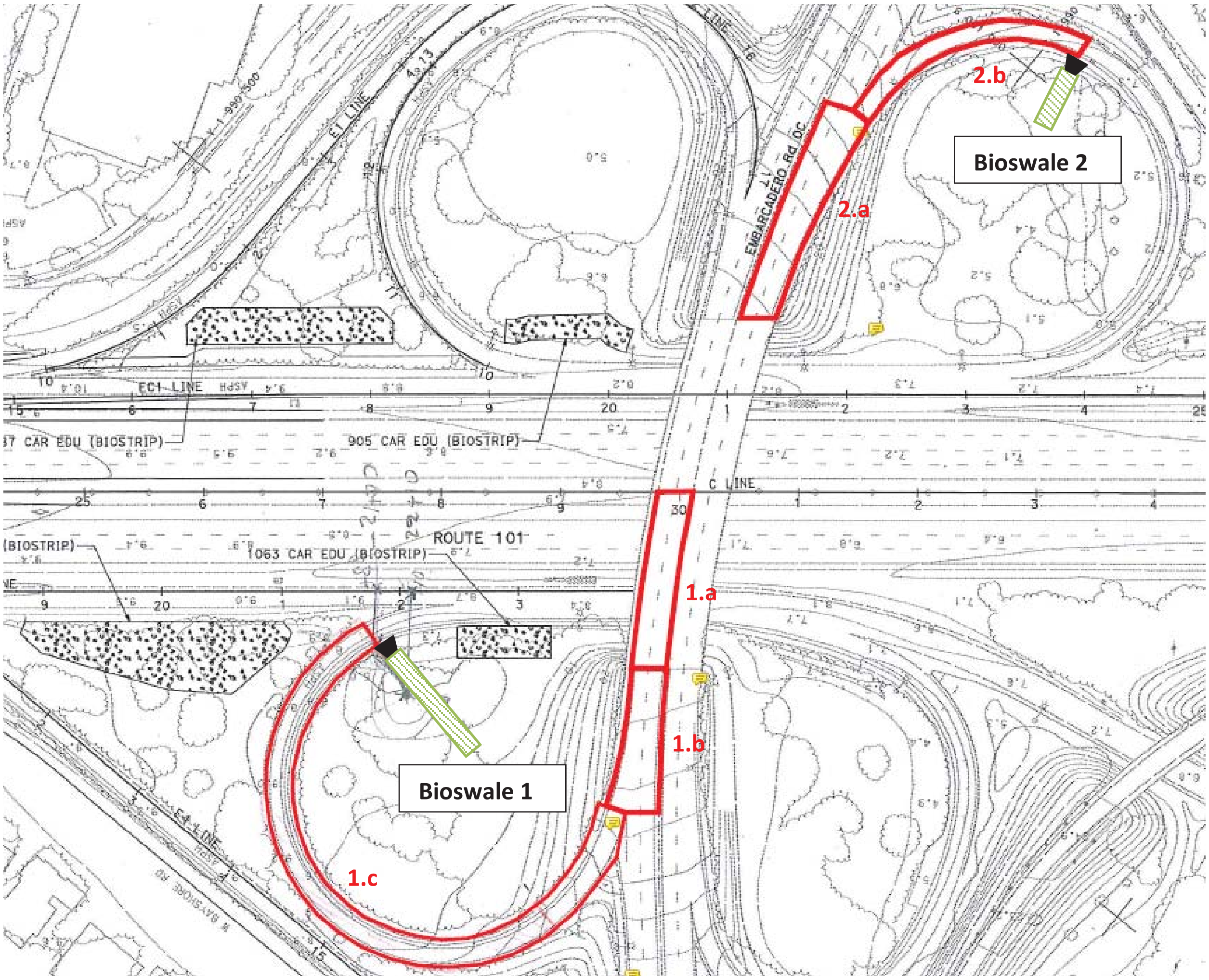
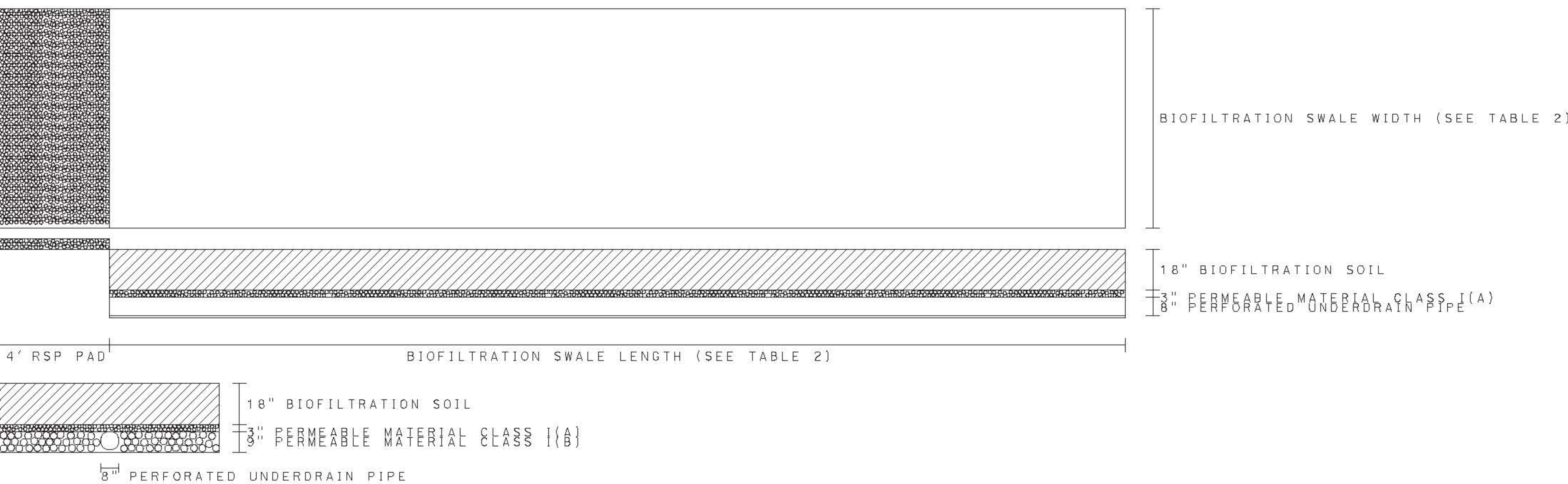


FIGURE 1 Location of Bioswales and tributary areas for each Bioswale

TABLE 2 Summary of Biowale dimensions and tributary area

No	BMP	Tributary Area		Location		Bioswale Dimensions		
				Start	End	Length	Width	Area
		SQ.FT	ACRES			FT	FT	SQ.FT
1	Bioswale 1	21,715	0.498	EC4 line, STA 22+00 60 FT RT	EC4 line, STA 22+20, 151 FT RT	109	8	872
2	Bioswale 2	9,652	0.222	EC1 line, STA 23+90, 277 FT RT	EC1 line, STA 23+50, 228 FT RT	49	8	392


BIOFILTRATION SWALE WIDTH (SEE TABLE 2)
18" BIOFILTRATION SOIL
3" PERMEABLE MATERIAL CLASS I(A)
8" PERFORATED UNDERDRAIN PIPE
4' RSP PAD
BIOFILTRATION SWALE LENGTH (SEE TABLE 2)
18" BIOFILTRATION SOIL
3" PERMEABLE MATERIAL CLASS I(A)
9" PERMEABLE MATERIAL CLASS I(B)
8" PERFORATED UNDERDRAIN PIPE

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

March 29, 2011

In response refer to:
2010/06575

Jeffrey Jensen, Chief
Office of Biological Sciences and Permits
California Department of Transportation, District 4
101 Grand Avenue
Oakland, California, 94612

Dear Mr. Jensen,

Thank you for your letter of November 18, 2010, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). Effective July 1, 2007, the Federal Highway Administration (FHWA) assigned, and the California Department of Transportation (Caltrans) has assumed all responsibilities for consultation and approval on most highway projects in California. Therefore, Caltrans is now considered the federal action agency for ESA consultations with NMFS for federally funded projects. This letter transmits NMFS biological opinion (Enclosure 1) for Caltrans proposed U.S. Highway 101 Bridge replacement project on San Francisquito Creek located at the border between San Mateo and Santa Clara counties, California. The enclosed biological opinion describes NMFS' analysis of the effect of implementing the proposed project on the threatened Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) and the threatened southern DPS of North American green sturgeon (*Acipencer medirostris*) and their designated critical habitats.

Based on the best available information, the enclosed biological opinion concludes the U.S. Highway 101 Bridge replacement over San Francisquito Creek may affect but is not likely to jeopardize the continued existence of CCC steelhead or the southern DPS of North American green sturgeon, and is not likely to result in the destruction or adverse modification of critical habitat for these species. An incidental take statement is included with the enclosed biological opinion. The incidental take statement includes non-discretionary terms and conditions that are expected to minimize the impacts of incidental take of listed salmonids and green sturgeon as a result of the bridge replacement activities. In addition, conservation recommendations have been included in the enclosed biological opinion.

This letter also transmits NMFS' Essential Fish Habitat (EFH) conclusions pursuant to section 305(b) of the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA) (Enclosure 2). San Francisquito Creek at the U.S. Highway 101 Bridge crossing includes areas identified as EFH for various life stages of species managed under the Pacific Groundfish, Coastal Pelagic, and Pacific Coast Salmon Fishery Management Plans (FMPs). Based on our review, NMFS concludes that the U.S. Highway 101 Bridge replacement project has the potential to adversely affect EFH. However, the proposed action contains adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. With the terms and conditions set forth in the biological opinion, NMFS has no additional EFH Conservation Recommendations to provide.

If you have any questions regarding the enclosed biological opinion, please contact Mr. Joel Casagrande at (707) 575-6016, or joel.casagrande@noaa.gov.

Sincerely,

FOR Rodney R. McInnis
Regional Administrator

Enclosures

cc: Chris Yates, NMFS, Long Beach
Margaret Gabil, Caltrans Office of Biological Sciences and Permits, Oakland
Suzanne DeLeon, CDFG, Yountville
Copy to file 151422-SWR-2010-SR00494

Enclosure 1

BIOLOGICAL OPINION

ACTION AGENCY:	California Department of Transportation (Caltrans)
ACTION:	United States (U.S.) Highway 101 San Francisquito Creek Bridge Replacement Project
CONSULTATION CONDUCTED BY:	National Marine Fisheries Service, Southwest Region
TRACKING NUMBER:	2010/05741
DATE ISSUED:	**March 29, 2011**

I. CONSULTATION HISTORY

Caltrans will be acting as the lead agency as per the agreement with the Federal Highway Administration (FHWA) in accordance with Section 6005 (a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (PL-109-59) to assume the FHWA Secretary's responsibilities under the National Environment Policy Act of 1969 (42 USC § 4351, *et seq.*) and all or part of the FHWA Secretary's responsibilities for environmental review, consultation, or other action required under any environmental law with respect to one or more highway projects within the state.

On November 26, 2010, NMFS received Caltrans' November 18, 2010, letter requesting initiation of formal consultation pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 *et seq.*), and the Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fisheries Conservation and Management Act, as amended, for the replacement of the U.S. Highway 101 Bridge over San Francisquito Creek. Caltrans determined that the project, as proposed, is likely to adversely affect listed Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) and the southern DPS of North American green sturgeon (*Acipenser medirostris*), and may affect but will not adversely affect designated critical habitat for CCC steelhead and southern DPS green sturgeon.

On December 2, 2010, staff from NMFS, Caltrans, and URS Corporation (Caltrans contractor) conducted a site visit at the project location to discuss the general scope of the project, project timelines, and potential dewatering strategies. Caltrans had originally proposed an open diversion channel to bypass waters (tidal and freshwater) through the project site. NMFS suggested that a closed pipe diversion would not only ensure better protection to aquatic species, but would also be more efficient thereby limiting the time required to complete the project. Caltrans agreed to use a closed pipe for their diversion, and on January 20, 2011, they provided NMFS with a general design for their closed water diversion. After receiving the updated water diversion plans on January 20, 2011, NMFS determined it had sufficient information to initiate consultation.

On February 11, 2011, Caltrans submitted updated information regarding the installation of sheet piles for bank stability. Caltrans had originally proposed to install sheet piles only at the upstream side of the bridge and for its cofferdams. However, Caltrans subsequently determined that the project will require the installation of additional sheet piles downstream of the bridge for temporary bank stability.

II. DESCRIPTION OF THE PROPOSED ACTION

Caltrans proposes to replace the U.S. Highway 101 Bridge over San Francisquito Creek on the border between San Mateo and Santa Clara Counties, at post mark (PM) SCL PM 101 52.5/SM 101 PM 0.0. The bridge consists of the U.S. Highway 101 bridge deck and the bridge decks for two frontage roads, East Bayshore Road and West Bayshore Road. These bridges were built over 50 years ago, have deteriorated, and need to be replaced. Much of the replacement work will be done by heavy construction equipment (excavators, dump trucks, etc.). The project is scheduled to last two to three years, and instream work will only occur between June 1 and October 15, unless a work window extension is granted by NMFS. Work outside of the live stream channel on the adjacent slopes, including bridge deck construction, vegetation clearing, and staging, will be conducted year round. The project is expected to start as early as 2011 and would be completed no later than 2014. There is one activity that is interrelated to this proposed action: the Route 101 Auxiliary Lanes-Embarcadero Road to Marsh Road Project (Auxilary Lanes Project).

A. Description of Project Activities

The existing U.S. Highway 101 Bridge over San Francisquito Creek was originally built in the 1930's. In 1957, the freeway/bridge structure was widened and the East Bayshore and West Bayshore frontage roads were added. The East Bayshore and West Bayshore road bridges cross over the creek on the same pier walls (*i.e.*, bridge supports) as the U.S Highway 101 Bridge. The current U.S. Highway 101 Bridge is 232 feet long and 80 feet wide and consists of an abutment on each end with two pier walls that divide the channel beneath San Francisquito Creek into three flow "cells". The current East Bayshore Road Bridge is 80 feet long and 38 feet wide, while the West Bayshore Road Bridge is 80 feet long and approximately 35 feet wide. The creek channel beneath the bridges and downstream to San Francisco Bay has a long history of flooding due to the limited channel capacity. The portion of the bridge built in the 1930's is deteriorating and the remainder of the bridge is over 50 years old. Therefore Caltrans determined that the entire bridge should be replaced.

The bridge accommodates heavy traffic originating from the U.S. Highway 101 freeway on the west side of San Francisco Bay and the two frontage roads. The replacement of the bridge would coincide with the addition of auxiliary lanes, a component of a separate Route 101 Auxiliary Lanes-Embarcadero Road to Marsh Road Project (Auxiliary Lanes Project). The Auxiliary Lanes Project would involve widening U.S. Highway 101 between University Avenue and Embarcadero Road to accommodate the new auxiliary lanes between the on-ramps and off-ramps in both directions of the freeway. This project is proposed to be constructed concurrently with the proposed bridge replacements.

The proposed U.S. Highway 101 Bridge replacement project involves demolishing the existing U.S. Highway 101 Bridge over San Francisquito Creek, including the bridge deck and two existing pier walls, and replacing it with a new bridge that is 14 feet wider and 44 feet longer (94 feet wide and 276 feet long). The bridge will be constructed to satisfy the lane requirements of the 101 Auxiliary Lanes Project and to accommodate greater flow capacity in the creek channel. The added length to the bridge will require the addition of a new pier wall. The freeway profile on each side of the bridge will be modified to conform to the new bridge deck, and the soundwall location on the bridge (west side) will be shifted to conform to the wider roadway. The West Bayshore Road and East Bayshore Road bridge decks will also be demolished and replaced in order to provide increased flood flow conveyance. These two bridge decks will each be 44 feet wide and 126 feet long and will continue to utilize the same bridge supports as the U.S. Highway 101 Bridge.

The new U.S. Highway 101 Bridge and the creek channel beneath the bridge will be widened in order to coordinate with a separate project proposed by the San Francisquito Creek Joint Powers Authority (SFCJPA). The SFCJPA is a government agency represented by the cities of East Palo Alto, Palo Alto, and Menlo Park, as well as the Santa Clara Valley Water District (SCVWD) and the San Mateo County Flood Control District. They are proposing a major flood control project for the lower reaches of San Francisquito Creek. The new U.S. Highway 101 Bridge and the creek channel beneath the bridge will be widened to facilitate the proposed new channel widths and will allow for an increase in creek flow based on the 100-year flood projections. The SFCJPA flood control project is currently planned to begin within the next 5 years and will require further environmental review. As of March 2011, the SFCJPA was in the process of developing their environmental documents for this project.

1. <u>Dewatering the Project Area</u>

The action area is located in a reach of San Francisquito Creek that is influenced by tides and therefore, both a stream flow and tidal diversion will be necessary to dewater the project area. Waters will be diverted through the project area using cofferdams and a large corrugated pipe. During low tide, a cofferdam consisting of sheet piles will be installed at the downstream end of the work area to create a temporary barrier to tidal flow. During this time, the downstream portion of the diversion pipe will be installed and will remain sealed to prevent tidal waters from entering the project area. At the upstream end, a similar cofferdam will be installed to create a check dam for outgoing stream flow. The upstream portion of the diversion pipe will be installed and will remain sealed to keep stream flows from entering the project work area. The cofferdams will be approximately six feet (ft) tall. Once the cofferdams are constructed, the remaining portions of the diversion pipe will be installed. After the diversion pipe is fully installed, it will be opened on both ends to allow tidal and stream flow exchange through the pipe. Caltrans anticipates using a 72-inch corrugated steel pipe, which will lie on the stream bed and would be staked into place using joint restrainer assemblies. Caltrans estimates that the cofferdams will take approximately one day each to install, while the installation of the diversion pipe will require approximately three days to install. The length of dewatered channel will be approximately 450-500 ft. The diversion will begin as early as June 1 and will extend to October 15 of each year unless a time extension is granted by NMFS. At the end of each dry season, the water diversion will be completely removed. If a pump is necessary to assist with dewatering of the action area, the pump(s) will be double-screened to prevent fish entrainment. The mesh on the screens will meet NMFS and California Department of Fish and Game (CDFG) guidelines for fish screening criteria (3/32 inches). Any water pumped from the creek prior to and/or during construction of the bridge will be stored in appropriate tanks pending water quality analysis. Caltrans will submit a stream water diversion plan for review no less than 30 days prior to beginning these activities.

2. Fish Collection and Relocation

Because the project will require water diversion, fish within the project area will be collected and relocated in order to minimize their risk of being harmed or killed. The fish collection and relocation activities will be conducted by a NMFS/CDFG-approved biologist. Methods used to capture and relocate fish in the project area may include dip net and seine. Due to the high conductivity of brackish waters, electrofishing will not be used. Caltrans will submit a fish relocation plan for review no less than 30 days prior to beginning these activities.

3. Bridge Demolition and Construction

The existing U.S. Highway 101 Bridge including the pier walls and the East Bayshore Road and West Bayshore Road decks will be demolished and removed using a mounted hydraulic jack hammer, an excavator, and dump trucks. Netting or suspended debris racks will be utilized to minimize the amount of debris falling into the creek channel and onto the water diversion pipe.

Once the channel is dewatered, timber pads will be laid down in the channel to support construction equipment. Approximately 200 piles (open pile class 200 alt. W) will be permanently installed. The piles will be approximately 80-90 feet long and 16 inches in diameter. The piles will be installed by pre-drilling through the sand layer of approximately 40 feet and then driven deeper into the mud layer using a pile driver. Approximately 6-8 piles per day will be installed. Pile driving is estimated to take approximately 30 work days to complete and will occur approximately eight hours per day during the dry season. Falsework will be constructed and the pile cap, pier walls, and bridge deck will be poured using a concrete pump truck and cement mixer.

Sheet piles will be installed with a pile driver at five locations including each of the four corners of the new bridge. These will serve as temporary wing-walls and will provide stability to the exposed creek banks. The sections where sheet piles will be installed will range in length from 24 to 32 feet and will be between 15 and 17 feet tall. Some of the existing bridge foundation and sacked concrete retaining walls will be removed prior to sheet pile installation. The addition of a third pier wall will create a fourth flow cell beneath the bridge between the new pier and the bridge abutment. The fourth cell will need to remain sealed off until the channel upstream and downstream is widened to match the wider channel dimensions beneath the bridge. This will be done with sheet piles that will be installed to serve as temporary wing walls between the new pier and the creek bank. In order to maintain structural integrity (*i.e.,* equalize pressure from water against the new pier), temporary screened openings will be made in the new pier wall. The openings will be screened to keep fish and other organisms from accessing this new cell. A rubber gasket or other device will be used to waterproof all cell, abutment, and retaining wall connections that will be exposed to creek flow. The sheet piles will be left in place until the SFCJPA flood wall project is constructed. Once the SFCJPA flood protection project is completed, all of the sheet piles will be removed and the fourth flow cell will become fully accessible. All temporary materials in the channel, including the falsework, cofferdams, and the creek diversion pipe will be removed at the end of each dry season and the end of the project.

4. <u>Proposed Best Management Practices and Conservation Measures</u>

Caltrans will implement best management practices (BMPs) during project construction to avoid and/or minimize potential impacts to special-status species and their designated critical habitat. Soil stabilization measures, sediment control, waste management, and materials pollution control BMPs will be implemented to prevent sediment and other pollutants from entering the channel during project construction. All practicable erosion and sediment control BMPs will be implemented to minimize the potential for impacts to water quality in San Francisquito Creek.

In addition to the BMPs described above, Caltrans has proposed general conservation measures to protect special-status species, sensitive habitats and waters of the United States. These measures include worker environmental awareness training prior to start-of-work, fencing off sensitive habitats, and the use of natural erosion control methods (straw pellets, native grass seed mix, or mulch) on all disturbed areas. Caltrans (2010) also includes species-specific conservation measures for steelhead and green sturgeon, which include conducting preconstruction surveys for ESA-listed species by a NMFS pre-approved biologist.

B. Description of the Action Area

The action area includes "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR § 402.02). For this consultation the action area includes the channel banks and bottom from approximately 200 feet upstream of the existing U.S. Highway 101 Bridge to approximately 1,000 feet downstream of the new bridge. NMFS assumes suspended sediments (*i.e.*, turbidity) generated during the installation and removal of the water diversion facilities would settle or become diluted in the tidal channel at a distance of approximately 1,000 feet downstream. Caltrans has determined that the total project footprint is 2.34 acres (101,930 square feet), which includes upland areas, jurisdictional wetlands, and other waters of the U.S. The length of the dewatered channel will extend approximately 450-500 feet. The channel within the action area has a trapezoidal form and is located in a heavily urbanized area along the U.S. Highway 101 corridor. Some sections of the creek banks have been armored with concrete.

III. ANALYTICAL FRAMEWORK

A. Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which evaluates the range-wide conditions of the CCC steelhead DPS and the southern DPS green sturgeon, the factors responsible for that condition, and the species' likelihood of both survival and recovery; (2) the Environmental Baseline, which evaluates the condition of these listed species in the action area, the factors responsible for that condition, and the relationship of the action area to the likelihood of both survival and recovery of these listed species; (3) the Effects of the Action, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on these species in the action area; and (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on these species.

The jeopardy determination is made by adding the effects of the proposed Federal action and any Cumulative Effects to the Environmental Baseline and then determining if the resulting changes in species status in the action area are likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these listed species in the wild.

The jeopardy analysis in this biological opinion places an emphasis on the range-wide likelihood of both survival and recovery of these listed species and the role of the action area in the survival and recovery of these listed species. The significance of the effects of the proposed Federal action is considered in this context, taken together with cumulative effects, for purposes of making the jeopardy determination. We use a hierarchical approach that focuses first on whether or not the effects on steelhead and green sturgeon in the action area will impact their respective populations. If the populations will be impacted, we assess whether this impact is likely to affect the ability of the populations to support the survival and recovery of the DPS.

B. Adverse Modification Determination

This biological opinion does not rely on the regulatory definition of destruction or adverse modification of critical habitat at 50 CPR 402.02[1]. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

The adverse modification analysis in this biological opinion relies on four components: (1) the Status of Critical Habitat, which evaluates the range-wide condition of critical habitat for the CCC steelhead DPS and the southern DPS of green sturgeon in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended conservation value of the critical habitat overall; (2) the Environmental Baseline, which evaluates the condition of critical habitat in the action area, the factors responsible for that condition, and the conservation value of the critical habitat in the action area; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs in the action area and how that will influence the conservation value of affected critical habitat units; and (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the conservation value of affected critical habitat units.

For purposes of the adverse modification determination, we add the effects of the proposed Federal action on CCC steelhead and southern DPS green sturgeon critical habitats in the action area, and any Cumulative Effects, to the Environmental Baseline and then determine if the resulting changes to the conservation value of critical habitat in the action area are likely to cause an appreciable reduction in the conservation value of critical habitat range-wide. Similar to the hierarchical approach used above, if the proposed action will negatively affect PCEs of critical habitat in the action area we then assess whether the conservation value of the action area will be reduced. If the action area is likely to have its critical habitat value reduced, we then assess whether or not this reduction will impact the value of the DPS's critical habitat designation as a whole.

C. Use of Best Available Scientific and Commercial Information

To conduct the assessment, NMFS examined an extensive amount of information from a variety of sources. Detailed background information on the biology and status of the listed species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, and governmental and non-governmental reports. Additional information regarding the effects of the project's

[1] This regulatory definition has been invalidated by Federal Courts.

actions on the listed species in question, their anticipated response to these actions, and the environmental consequences of the actions as a whole was formulated from the aforementioned resources, the biological assessment for this project, and project meeting notes if applicable. For information that has been taken directly from published, citable documents, those citations have been referenced in the text and listed at the end of this document.

IV. STATUS OF THE SPECIES/CRITICAL HABITAT

This biological opinion analyzes the effects of the proposed action on the steelhead and green sturgeon DPS's listed below:

- CCC steelhead DPS, listed as threatened under the ESA (71 FR 834), January 5, 2006
- Southern DPS of North American green sturgeon, listed as threatened under the ESA (71 FR 17757), April 7, 2006

The action area is within the designated critical habitat listed below:

- CCC steelhead critical habitat (70 FR 52488), September 2, 2005.
- Southern DPS of North American green sturgeon critical habitat (74 FR 52300), October 9, 2009.

A. Species Description, Life History, and Status

In this opinion, NMFS assesses four population viability parameters to help us understand the status of CCC steelhead and southern DPS green sturgeon and their populations' ability to survive and recover. These population viability parameters are: abundance, population growth rate, spatial structure, and diversity (McElhany *et al.* 2000). While there is insufficient information to evaluate these population viability parameters in a thorough quantitative sense, NMFS has used existing information to determine the general condition of each population and factors responsible for the current status of each DPS or ESU.

We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.20). For example, the first three parameters are used as surrogates for numbers, reproduction, and distribution. We relate the fourth parameter, diversity, to all three regulatory criteria. Numbers, reproduction, and distribution are all affected when genetic or life history variability is lost or constrained resulting in reduced population resilience to environmental variation at local or landscape-level scales.

1. Steelhead

a. General Life History

Steelhead are anadromous forms of *O. mykiss*, spending some time in both freshwater and saltwater. Steelhead young usually rear in freshwater for one to three years before migrating to the ocean as smolts, but rearing periods of up to seven years have been reported. Migration to the ocean usually occurs in the spring. Steelhead may remain in the ocean for one to five years (two to three years is most common) before returning to their natal streams to spawn (Busby *et al*. 1996). The distribution of steelhead in the ocean is not well known. Coded wire tag recoveries indicate that most steelhead tend to migrate north and south along the continental shelf (Barnhart 1986).

Steelhead can be divided into two reproductive ecotypes, based upon their state of sexual maturity at the time of river entry and the duration of their spawning migration: stream maturing and ocean maturing. Stream maturing steelhead enter fresh water in a sexually immature condition and require several months to mature and spawn, whereas ocean maturing steelhead enter fresh water with well-developed gonads and spawn shortly after river entry. These two reproductive ecotypes are more commonly referred to by their season of freshwater entry (*i.e.*, summer [stream maturing] and winter [ocean maturing] steelhead). The timing of upstream migration of winter steelhead is correlated with higher flow events, such as freshets or sandbar breaches. Adult summer steelhead migrate upstream from March through September. In contrast to other species of *Oncorhynchus*, steelhead may spawn more than one season before dying (iteroparity); although one-time spawners represent the majority.

Because rearing juvenile steelhead reside in freshwater all year, adequate flow and temperature are important to the population at all times (CDFG 1997). Outmigration appears to be more closely associated with size than age. In Waddell Creek, Shapovalov and Taft (1954) found steelhead juveniles migrating downstream at all times of the year, with the largest numbers of young-of-year (YOY) and age 1+ steelhead moving downstream during spring and summer.

Survival to emergence of steelhead embryos is inversely related to the proportion of fine sediment in the spawning gravels. However, steelhead are slightly more tolerant than other salmonids, with significant reductions in survival when fine materials of less than 0.25 inches in diameter comprise 20 to 25 percent of the substrate. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart 1986).

Upon emerging from the gravel, fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Older fry establish territories which they defend. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Meehan and Bjornn 1991). Steelhead, however, tend to use riffles and other habitats not strongly associated with cover during summer rearing more than other salmonids. Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. In winter, juvenile steelhead become less active and hide in available cover, including gravel or woody debris.

Water temperature can influence the metabolic rate, distribution, abundance, and swimming ability of rearing juvenile steelhead (Barnhart 1986, Bjornn and Reiser 1991, Myrick and Cech 2005). Optimal temperatures for steelhead growth range between 10 and 20 degrees (°) Celsius (C) (Hokanson *et al.* 1977, Wurtsbaugh and Davis 1977, Myrick and Cech 2005). Fluctuating diurnal water temperatures are also important for the survival and growth of salmonids (Busby *et al.* 1996).

Suspended sediment concentrations, or turbidity, also can influence the distribution and growth of steelhead (Bell 1973, Sigler *et al*. 1984, Newcombe and Jensen 1996). Bell (1973) found suspended sediment loads of less than 25 milligrams per liter (mg/L) were typically suitable for rearing juvenile steelhead.

b. Status of the CCC Steelhead DPS and Critical Habitat

Historically, approximately 48 populations of steelhead existed in the CCC steelhead DPS (Bjorkstedt *et al.* 2005). Many of these populations (about 36) were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts (Spence *et al.* 2008). The remaining populations were dependent upon immigration from nearby CCC steelhead DPS populations to ensure their viability (McElhaney *et al.* 2000, Bjorkstedt *et al.* 2005).

While historical and present data on abundance are limited, CCC steelhead numbers are substantially reduced from historical levels. A total of 94,000 adult steelhead were estimated to spawn in the rivers of this DPS in the mid-1960's, including 50,000 fish in the Russian River – the largest population within the DPS (Busby *et al.* 1996). Near the end of the 20th Century, McEwan (2001) estimated the wild run population in the Russian River Watershed was between 1,700-7,000 fish. Abundance estimates for smaller coastal streams in the DPS indicate low but stable levels with recent estimates for several streams (Lagunitas, Waddell, Scott, San Vicente, Soquel, and Aptos creeks) of individual run sizes of 500 fish or less (62 FR 43937). For more detailed information on trends in CCC steelhead abundance, see: Busby *et al*. 1996, NMFS 1997, and NMFS 2005.

Some loss of genetic diversity has been documented and attributed to previous among-basin transfers of stock and local hatchery production in interior populations in the Russian River (Bjorkstedt *et al.* 2005). Reduced population sizes and fragmentation of habitat in San Francisco streams has likely also led to loss of genetic diversity in these populations.

CCC steelhead have experienced a serious decline in abundance and long-term population trends suggest a negative growth rate. This indicates the DPS may not be viable in the long term. DPS populations that historically provided enough steelhead immigrants to support dependent populations may no longer be able to do so, placing dependent populations at increased risk of extirpation. However, because CCC steelhead have maintained a wide distribution throughout the DPS, roughly approximating the known historical distribution, CCC steelhead likely possess a resilience that is likely to slow their decline relative to other salmonid DPSs or ESUs in worse condition. The most recent status review concludes steelhead in the CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (Good *et al.* 2005), a conclusion that was consistent with a previous assessment (Busby *et al.* 1996) and supported by the most recent NMFS Technical Recovery Team work (Spence *et al.* 2008). On January 5, 2006, NMFS issued a final determination that the CCC steelhead DPS is a threatened species, as previously listed (71 FR 834). Data from the 2008/09 and 2009/2010 adult CCC steelhead returns indicate a decline in returning adults across their range compared to other recent returns (*e.g.*, 2006/2007, 2007/2008) (Jeffrey Jahn, NMFS, personal communication, November 2010).

The condition of CCC steelhead critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined present depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat[2]: logging, agricultural and mining activities, urbanization, stream channelization, dams, wetland loss, and water withdrawals, including unscreened diversions for irrigation. Impacts of concern include alteration of stream bank and channel morphology, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels and large woody debris, degradation of water quality, removal of riparian vegetation resulting in increased stream bank erosion, increases in sedimentation in streams from upland areas, loss of shade (higher water temperatures) and loss of nutrient inputs (Busby *et al.* 1996, 70 FR 52488). Depletion and storage of natural river and stream flows have drastically altered natural hydrologic cycles in many of the streams in the DPS. Alteration of flows results in migration delays, loss of suitable habitat due to dewatering and blockage; stranding of fish from rapid flow fluctuations; entrainment of juveniles into poorly screened or unscreened diversions, and increased water temperatures harmful to salmonids. Overall, current condition of CCC steelhead critical habitat is degraded, and may not provide the conservation value necessary for the recovery of the species.

[2] Other factors, such as over-fishing and artificial propagation have also contributed to the current population status of these species. All these human induced factors have exacerbated the adverse effects of natural environmental variability including drought and poor ocean conditions.

2. <u>Green Sturgeon</u>

a. General Life History

Adult green sturgeon are believed to spawn every 3 to 5 years and generally exhibit fidelity to their spawning site. Green sturgeon reach sexual maturity only after several years of growth; first spawning generally occurs at 15 years of age for males, and 17 years for females. The southern DPS green sturgeon spawn in the deep turbulent sections of the upper reaches of the Sacramento River. CDFG (2002) report southern DPS green sturgeon spawning occurs above Hamilton City and possibly as far upstream as Keswick Dam. Adults typically begin their upstream spawning migrations into the San Francisco Bay by late February to early March, reach Knights Landing by April, and spawn between March and July (Heublein *et al.* 2009). Peak spawning is believed to occur between mid-April to mid-June. Green sturgeon in the Sacramento River can display two outmigration strategies. Monitoring data reveals that post-spawned green sturgeon can leave the Sacramento River prior to September 1, or remain in the river for several additional months (Heublein *et al.* 2009).

Adult female green sturgeon produce between 60,000 and 140,000 eggs, depending on body size, with a mean egg diameter of 4.3 mm (Moyle *et al.* 1992, Van Eenennaam *et al.* 2001). Eggs are likely broadcast spawned over large cobble substrate where they settle into the spaces between the cobbles, but substrate can range from clean sand to bedrock (USFWS 2002). Like salmonids, green sturgeon require cool water temperatures for egg and larval development, with optimal temperatures ranging from 11 to 18˚C.

Juvenile green sturgeon spend from one to three years in freshwater before they enter the ocean (Nakamoto *et al.* 1995, Adams *et al.* 2002). Based on Klamath River age distribution work by Nakamoto *et al.* (1995), the majority of fish entering the ocean are between 200 and 600 mm in length which suggests they are 2 to 3 years of age. The low abundance of juveniles smaller than 200 mm in the Delta indicates juvenile southern DPS green sturgeon likely hold in the mainstem Sacramento River, as suggested by Kyndard *et al.* (2005). Laboratory studies, conducted by Allen and Cech, Jr. (2007), also indicated juveniles spend approximately the first six months in fresh to brackish water and then transition into salt water at about 1.5 years of age.

Both adult and juvenile green sturgeon are benthic feeders (Moyle 2002). Adult green sturgeon are believed to feed primarily upon benthic invertebrates such as clams, mysid and grass shrimp, and amphipods (Radtke 1966, Adams *et al.* 2002), and to some extent on fish. Adults captured in the Sacramento-San Joaquin Delta are known to feed on invertebrates such as shrimp, mollusks, amphipods, and additionally upon small fish (Adams *et al.* 2002). Juvenile green sturgeon in the San Francisco Bay have been shown to feed on opossum shrimp (*Neomysis mercedie*) and amphipods (*Corophium spp.*) (Moyle 2002).

Southern DPS green sturgeon are also known to inhabit nearshore marine waters, and are commonly observed in bays and estuaries. Kelly *et al.* (2007) studied the movement of six green sturgeon (one adult and five sub-adults) in the San Francisco Estuary (tagged in San Pablo Bay) and discovered while adults and sub-adults occupied shallow water depths, there were distinct directional movements. In contrast, when the fish exhibited non-directional movements, they remained close to the bottom. The movements were not found to be related to salinity, current, or temperature and the authors surmised they are related to food resource availability.

b. Status of Southern DPS Green Sturgeon and Critical Habitat

The southern DPS green sturgeon is considered vulnerable to catastrophic events due in part to a small estimated spawning population and drastic reductions in historically accessible spawning habitat. The precise population size of southern DPS green sturgeon is unknown, but it is likely to be much smaller than the northern DPS. Population abundance information concerning the southern DPS green sturgeon is described in the NMFS status reviews (Adams *et al*. 2002, NMFS 2005). Abundance information is limited, coming mainly from three sources: 1) incidental captures in the CDFG white sturgeon monitoring program, 2) fish monitoring efforts associated with two diversion facilities on the upper Sacramento River, and 3) fish salvage operations at the water export facilities on the Sacramento-San Joaquin Delta. These data are insufficient in a variety ways (short time series, non-target species, etc.) and do not support more than a qualitative evaluation of changes in green sturgeon abundance.

Some population abundance information comes from incidental captures of southern DPS green sturgeon from the white sturgeon monitoring program by the CDFG sturgeon tagging program (CDFG 2002). CDFG (2002) utilizes a multiple-census or Peterson mark-recapture method to estimate the legal population of white sturgeon captures in trammel nets. By comparing ratios of white sturgeon to green sturgeon captures, CDFG provides estimates of adult and sub-adult southern DPS green sturgeon abundance. Estimated abundance between 1954 and 2001 ranged from 175 fish to more than 8,000 per year and averaged 1,509 fish per year. Unfortunately, there are many biases and errors associated with these data, and CDFG does not consider these estimates reliable. Fish monitoring efforts at the Red Bluff Diversion Dam (RBDD) and Glenn-Colusa Irrigation District (GCID) on the upper Sacramento River have captured between 0 and 2,068 juvenile southern DPS green sturgeon per year (Adams *et al*. 2002).

Green sturgeon salvage numbers are recorded at California State (1968-present) and Federal (1980-present) water export facilities on the Sacramento-San Joaquin Delta. The average number of southern DPS green sturgeon taken per year at the state facility prior to 1986 was 732; from 1986 to 2001, the average per year was 47 (70 FR 17386). For the Federal facility, the average number prior to 1986 was 889; from 1986 to 2001 the average was 32 (70 FR 17386). Additional analysis of southern DPS green sturgeon indicate a downward trend in the number of green sturgeon per acre-foot of exported water at state and Federal facilities since 1974 and 1983 respectively. Direct capture in salvage operations is a small component of the overall effect of water export facilities on southern DPS green sturgeon; entrained juvenile green sturgeon are exposed to potential high levels of predation by exotic predators, disruption in migratory behavior, and poor habitat quality. Delta water exports have increased substantially over the last ten years and it is likely that this has contributed to negative trends in the abundance of migratory fish that utilize the delta, including the southern DPS green sturgeon. Catches of sub-adult and adult southern DPS green sturgeon by the Interagency Ecological Program between 1996 and 2004 ranged from 1 to 212 green sturgeon per year (212 occurred in 2001), however, the portion of these captures consisting of southern DPS green sturgeon is unknown as the fish were primarily captured in San Pablo Bay which is known to consist of a mixture of northern and southern DPS green sturgeon.

Recent spawning population estimates using sibling based genetics by Israel (2006) indicates a maximum spawning population of 32 spawners in 2002, 64 in 2003, 44 in 2004, 92 in 2005, and 124 in 2006 above RBDD (with an average of 71). Based on the length and estimated age of post-larvae captured at RBDD (approximately two weeks of age) and GCID (downstream; approximately three weeks of age), it appears the majority of southern DPS green sturgeon are spawning above RBDD.[3]

The most recent status review update concluded the southern DPS green sturgeon is likely to become endangered in the foreseeable future due to the substantial loss of spawning habitat, the concentration of a single spawning population in one section of the Sacramento River, and multiple other risks to the species such as stream flow management, degraded water quality, and introduced species (NMFS 2005). Based on this information, the southern DPS green sturgeon was listed as threatened on April 7, 2006 (71 FR 17757).

Critical habitat was designated for the southern DPS of green sturgeon on October 9, 2009 (74 FR 52300) and includes coastal United States marine waters within 60 fathoms depth from, and including, Monterey Bay, California, north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its United States boundary. The project's action area (*i.e.*, tidal portion of San Francisquito Creek) is located within designated critical habitat for southern DPS green sturgeon. Primary constituent elements of designated critical habitat in the action area include adequate food resources and foraging habitat; and the estuarine water column, which includes suitable depth, sediment, and water quality.

[3] There are many assumptions with this interpretation (*i.e*., equal sampling efficiency and distribution of post-larvae across channels) and this information should be considered cautiously.

The current condition of critical habitat for the southern DPS of green sturgeon is degraded over its historical conditions. It does not provide the full extent of conservation values necessary for the recovery of the species, particularly in the upstream riverine habitat of the Sacramento River. In particular, passage and water flow PCEs have been impacted by human actions, substantially altering the historical river characteristics in which the southern DPS of green sturgeon evolved. In addition, the alterations to the Sacramento-San Joaquin River Delta may have a particularly strong impact on the survival and recruitment of juvenile green sturgeon due to their protracted rearing time in the delta and estuary. Loss of individuals during this phase of the life history of green sturgeon represents losses to multiple year classes rearing in the Delta, which can ultimately impact the potential population structure for decades to come.

B. Factors Responsible for Steelhead and Sturgeon Stock Declines

NMFS cites many reasons (primarily anthropogenic) for the decline of steelhead (Busby *et al*. 1996) and southern DPS of green sturgeon (Adams *et al.* 2002, NMFS 2005). The foremost reason for the decline in these anadromous populations is the degradation and/or destruction of freshwater and estuarine habitat. Additional factors contributing to the decline of these populations include: commercial and recreational harvest, artificial propagation, natural stochastic events, marine mammal predation, and reduced marine-derived nutrient transport.

The following section details the general factors affecting the CCC steelhead and southern green sturgeon in California. The extent to which there are species specific differences in these factors is not clear; however, the freshwater ecosystem characteristics necessary for the maintenance of self-sustaining populations of steelhead and green sturgeon are similar. Therefore, most of these factors below affect both steelhead and green sturgeon.

1. <u>Habitat Degradation and Destruction</u>

The best scientific information presently available demonstrates a multitude of factors, past and present, have contributed to the decline of west coast salmonids by reducing and degrading habitat by adversely affecting essential habitat features. Most of this habitat loss and degradation has resulted from anthropogenic watershed disturbances caused by urban development, agriculture, poor water quality, water resource development, dams, gravel mining, forestry (Busby *et al.* 1996, Adams *et al.* 2002, Good *et al.* 2005), and lagoon management (Smith 1990, Bond 2006).

2. <u>Commercial and Recreational Harvest</u>

Ocean salmon fisheries off California are managed to meet the conservation objectives for certain stocks of salmon listed in the Pacific Coast Salmon Fishery Management Plan, including any stock that is listed as threatened or endangered under the ESA. Early records did not contain quantitative data by species until the early 1950's. In addition, the confounding effects of habitat deterioration, drought, and poor ocean conditions on salmonids make it difficult to assess the degree to which recreational and commercial harvest have contributed to the overall decline of salmonids and green stugeon in West Coast rivers.

3. Artificial Propagation

Releasing large numbers of hatchery fish can pose a threat to wild salmon and steelhead stocks through genetic impacts, competition for food and other resources, predation of hatchery fish on wild fish, and increased fishing pressure on wild stocks as a result of hatchery production (Waples 1991).

4. Natural Stochastic Events

Natural events such as droughts, landslides, floods, and other catastrophes have adversely affected salmon and steelhead populations throughout their evolutionary history. The effects of these events are exacerbated by anthropogenic changes to watersheds such as logging, roads, and water diversions. These anthropogenic changes have limited the ability of salmon and steelhead to rebound from natural stochastic events and depressed populations to critically low levels.

5. Marine Mammal Predation

The population of some marine mammal species, such as the Harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus*), have increased along the Pacific Coast (NMFS 1999). Although predation by these mammals is not believed to be a major factor in overall population decline, there may be substantial localized impacts on salmonids particularly during the migration season (Hanson 1993).

6. Reduced Marine-Derived Nutrient Transport

Marine-derived nutrients from adult salmon carcasses have been shown to be vital for the growth of juvenile salmonids and the surrounding terrestrial and riverine ecosystems (Bilby *et al*. 1996, Bilby *et al*. 1998, Gresh *et al*. 2000). Declining salmon and steelhead populations have resulted in decreased marine-derived nutrient transport to many watersheds. This has contributed to the further decline of ESA-listed salmonid populations (Gresh *et al*. 2000).

7. Ocean Conditions

Recent evidence suggests poor ocean conditions played a significant role in the low number of returning adult fall run Chinook salmon to the Sacramento River in 2007 and 2008 (Lindley *et al.* 2009). The decline in ocean conditions likely affected ocean survival of all west coast salmonid populations (Good *et al.* 2005, Spence *et al.* 2008).

C. Global Climate Change

The acceptance of global climate change as a scientifically valid and anthropogenically driven phenomenon has been well established by the United Nations Framework Convention on Climate Change (UNFCCC), the Intergovernmental Panel on Climate Change, and others (Davies *et al.* 2001, Oreskes 2004, UNFCCC 2006). The most relevant trend in climate change is the warming of the atmosphere from increased greenhouse gas emissions. This warming is inseparably linked to the oceans, the biosphere, and the world's water cycle. Changes in the distribution and abundance of a wide array of biota confirm a warming trend is in progress, and that it has great potential to affect species' survival (Davies *et al.* 2001). In general, as the magnitude of climate fluctuations increases, the population extinction rate also increases (Good *et al*. 2005). Global warming is likely to manifest itself differently in different regions.

Modeling of climate change impacts in California suggests average summer air temperatures are expected to increase (Lindley *et al*. 2007). Heat waves are expected to occur more often, and heat wave temperatures are likely to be higher (Hayhoe *et al*. 2004). Total precipitation in California may decline; critically dry years may increase (Lindley *et al*. 2007, Schneider 2007). The Sierra Nevada snow pack is likely to decrease by as much as 70 to 90 percent by the end of this century under the highest emission scenarios modeled (Luers *et al*. 2006). Wildfires are expected to increase in frequency and magnitude, by as much as 55 percent under the medium emissions scenarios modeled (Luers *et al*. 2006). Vegetative cover may also change, with decreases in evergreen conifer forest and increases in grasslands and mixed evergreen forests. The likely change in amount of rainfall in Northern and Central Coastal streams under various warming scenarios is less certain, although as noted above, total rainfall across the state is expected to decline. For the California North Coast, some models show large increases (75 to 200 percent) while other models show decreases of 15 to 30 percent (Hayhoe *et al*. 2004). Many of these changes are likely to further degrade salmonid habitat by, for example, reducing stream flows during the summer and raising summer water temperatures. Estuaries may also experience changes detrimental to green sturgeon. Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia *et al.* 2002). The projections described above are for the mid to late 21st Century. In shorter time frames natural climate conditions are more likely to predominate (Cox and Stephenson 2007, Smith *et al.* 2007).

V. ENVIRONMENTAL BASELINE

The environmental baseline is the current status of species and critical habitat in the action area based on analysis of the effects of past and ongoing human and natural factors. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impacts of State or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

The proposed project is located where U.S. Highway 101 crosses San Francisquito Creek at the border of southern San Mateo and northern Santa Clara counties. This reach of San Francisquito Creek is located in a heavily urbanized, low gradient area, historically occupied by extensive tidal marshes at the edge of San Francisco Bay. The project location is approximately one mile upstream of the current mouth of the creek at San Francisco Bay and does experience daily tidal fluctuations.

San Francisquito Creek Watershed drains approximately 47.5-square-miles on the eastern side of the Santa Cruz Mountains. Major tributaries include Bear Creek, Corte Madera Creek, and Los Trancos Creek, which converge to form San Francisquito Creek. The project area has a Mediterranean climate, typical of the California's central coast, with cool, wet winters and a long, mild dry season. Rainfall in the winter averages approximately 35 inches per year, falling mainly between the months of October and March. Portions of the upper San Francisquito Creek watershed are perennial and support spawning and rearing habitat for CCC steelhead. Sections of the mainstem of San Francisquito Creek dry by late spring or early summer in most years (Launer and Spain 1998, Metzger 2002, Jones and Stokes 2006).

A. Status of Critical Habitat within the Action Area

The lower reaches of San Francisquito Creek are heavily channelized and some areas of the stream banks are armored with concrete to prevent erosion (Figures 1 and 2). In the action area, San Francisquito Creek is tidally influenced. The channel bottom is fairly uniform throughout this section and is only completely flooded during high tides. Within the action area, bank vegetation is limited and is dominated by non-native, ruderal species including ice plant, poison hemlock, and various species of annual grasses. Channel substrate is predominantly sand upstream of the bridge and silt and clay

Figure 1. San Francisquito Creek immediately downstream of the U.S. Highway 101 Bridge, looking downstream on April 7, 2008 (Photo: Caltrans 2010)

Figure 2. San Francisquito Creek upstream of the U.S. Highway 101 Bridge looking downstream on June 8, 2010 (Photo: Caltrans 2010)

downstream, and therefore this reach does not support spawning habitat for either CCC steelhead or southern DPS green sturgeon. Freshwater flow through the action area during the dry season is either non-existent or consists largely of urban runoff.

For CCC steelhead, this reach of San Francisquito Creek only serves as migratory habitat for adults during winter and spring, and smolts during the smolt out-migration period in spring. NMFS believes that the PCEs for migration within the action area are good due to the lack of migration impediments (Caltrans 2010); however the overall PCEs for migration in the watershed are degraded due to multiple barriers upstream in the watershed (Smith and Harden 2001, Cleugh and McKnight 2002, Spence *et al.* 2008). Overall, the PCEs for steelhead rearing throughout the mainstem of San Francisquito Creek are degraded due to channelization, limited pool development and overwintering habitat, and impacted water quality conditions (Jones and Stokes 2006). Meanwhile, the PCEs for spawning in the watershed have also been degraded due to sedimentation (Jones and Stokes 2006).

For southern DPS green sturgeon, the action area could potentially provide suitable rearing habitat in the tidal portions of the channel. NMFS believes the overall PCE for rearing of green sturgeon are degraded due to the poor overall condition of the habitat, including a lack of emergent marsh, limited depth and cover, and reduced channel complexity. Adult southern DPS green sturgeon are only known to spawn in deep, turbulent pools in the upper Sacramento River below Keswick Dam and therefore spawning would not occur in the San Francisquito Creek watershed.

B. Status of Listed Species in the Action Area

1. <u>CCC Steelhead</u>:

The San Francisquito Creek steelhead population has been classified as potentially independent (Bjorkstedt *et al.* 2005, Spence *et al.* 2008). Juvenile and adult abundance data for this watershed are very limited. Overall, the watershed's population status, trends, and viability were found to be insufficient (Spence *et al.* 2008).

Based on more recent observations, adult steelhead continue to use San Francisquito Creek and its tributaries (Launer and Spain 1998, Leidy *et al.* 2005). Most steelhead presence data are based on observations from local residents/biologists and pertain primarily to the upper watershed. Launer and Spain (1998) conducted observations of fish and amphibian communities in San Francisquito Creek through the Stanford University property during the summer of 1997. Based on their observations, they estimated a few thousand juvenile steelhead inhabited that segment of the creek, which represents a small fraction of the total available rearing habitat available to steelhead in the watershed. In the summer of 2004, juvenile steelhead were captured and relocated at two sites on the upper mainstem of San Francisquito Creek. Juvenile steelhead densities at the two sites were approximately 17 and 12 fish per 100 feet respectively (Alley and Associates 2004).

Steelhead use of the action area would be primarily as migratory habitat for adults and smolts migrating in and out of the watershed. As noted earlier, reaches upstream of the U.S. Highway 101 Bridges go dry in most years and therefore summer rearing habitat is not available at this location (Launer and Spain 1998, Metzger 2002, Leidy et al. 2005). In the action area, NMFS expects juvenile and smolt steelhead presence during the summers will be limited to very few individuals, if any, due to the lack of connection with upstream rearing areas in most years, the timing of project implementation (*i.e.*, at the end of the smolt out-migration season), and the poor quality of rearing habitat described above.

2. <u>Southern DPS Green Sturgeon</u>:

There are no known records of green sturgeon utilizing San Francisquito Creek or its watershed for spawning or rearing (David Woodbury, NMFS, personal communication, December 21, 2010). Juvenile green sturgeon have occasionally been captured by CDFG during trawl surveys in southern San Francisco Bay (David Woodbury, NMFS, personal communication, December 21, 2010). While no surveys for green sturgeon have been conducted in the action area, tidal sloughs are used as foraging habitat by green sturgeon, and green sturgeon have been observed nearby in southern San Francisco Bay. Therefore, NMFS assumes they are present in the action area when tidal conditions permit. Based on the poor condition of habitat in the action area for green sturgeon (*i.e.*, shallow waters, poor cover, and limited foraging habitat) NMFS expects very few green sturgeon juveniles will be present.

C. Factors Affecting Species Environment within San Francisquito Creek and the Action Area

Jones and Stokes (2006) conducted a limiting factors analysis for steelhead in the San Francisquito Creek. Based on their conclusion, multiple factors are impacting the survival and abundance of steelhead in San Francisquito Creek. They identified poor overwintering habitat (*i.e.*, a lack of deep, complex pools) as the primary limiting factor for juvenile survival. Although the availability of summer rearing habitat was not found to be a limiting factor, they noted that summer rearing habitat was degraded due to a lack of deep pools, low abundance of large woody debris, limited coarse substrate accumulations caused by channelization, urban development, and stream flow regulation. Steelhead outmigration success is limited by seasonal drying which may be further impacted by fish passage impediments in San Francisquito Creek. In dry to average years, low spring outmigration flows severely limits passage for out-migrating smolts (Dr. Jerry Smith, SJSU, personal communication, December 6, 2010). Multiple dams in the upper watershed have blocked approximately 33 percent of the historic spawning habitat in the San Francisquito Creek watershed (Spence *et al.* 2008).

Within the action area, a lack of persistent summer stream flow, suitable cover, and poor substrate conditions likely precludes juvenile steelhead from utilizing this reach successfully for summer rearing. Use of the action area by juvenile green sturgeon during summer would be limited to periods of high tide when the channel is fully inundated. Even during high tide, foraging habitat is limited to the channel bottom and cover from predators is scarce in this heavily channelized reach.

D. Previous Section 7 Consultations and Section 10 permits in the Action Area

NMFS has conducted one previous section 7 consultation within the action area. This project was for the construction of a storm water pumping station located immediately downstream of the U.S. Highway 101 Bridge (shown in Figure 3) and was found to not likely adversely affect CCC steelhead or designated critical habitat.

Section 10(a)(1)(A) research and enhancement permits and research under exemptions granted in section 4(d) of the ESA could potentially occur in the San Francisquito Creek Watershed. Currently, four active section 10(a)(1)(A) research and enhancement permits have been issued that authorize research on CCC steelhead in the San Francisquito Creek Watershed. As of 2010, no take of CCC steelhead has occurred in the San Francisquito Creek Watershed related to these permits.

VI. EFFECTS OF THE PROPOSED ACTION

The purpose of this section is to identify the direct and indirect effects of the proposed action, and any interrelated or interdependent activities, on threatened CCC steelhead and southern DPS green sturgeon and their designated critical habitat. Data to quantitatively determine the precise effects of the proposed action on these species and their critical habitat are limited or not available; the assessment of effects therefore focuses mostly on qualitative identification. This approach was based on knowledge and review of the ecological literature concerning the effects of loss and alteration of habitat elements important to salmonids and green sturgeon, including the primary constituent elements of critical habitat. This information was used to gauge the likely effects of the proposed project via an exposure and response framework that focuses on what stressors (physical, chemical, or biotic), directly or indirectly caused by the proposed action, that steelhead and green sturgeon and their critical habitat are likely to be exposed to. Next, we evaluate the likely response of steelhead and green sturgeon and their critical habitat to these stressors in terms of changes to survival, growth and reproduction, and changes to the ability of PCEs to support the value of critical habitat.

A. Fish Relocation Activities

Based on the poor habitat quality and lack of perennial stream flow in the lower creek channel, NMFS assumes the presence of both juvenile steelhead and green sturgeon will be rare in the action area during the proposed construction period (June 1-October 15).

However, due to inter-annual variation in stream flow patterns and smolt out-migration timing/duration, a small number of juvenile and/or smolt steelhead (less than 20 individuals each year) may be encountered during the initial dewatering in early June. Similarly, juvenile green sturgeon may be encountered while foraging in the tidal portions of the creek. NMFS anticipates only a small number of juvenile green sturgeon (less than 20 individuals each year), if any, to be present in the project area during the proposed action.

Once the diversion facilities are in place, steelhead and green sturgeon will be able to move through the work area in the diversion pipe only. Before and during dewatering of the work area, the applicant will capture and relocate fish within the work area in order to avoid direct mortality and minimize the possible stranding of fish. Steelhead and green sturgeon in the project area will be captured by seine and or dip net, and then transported and released to a suitable location downstream of the dewatered channel. Electrofishing will not be used to capture fish due to potentially high salinity/conductivity levels in the tidal channel.

Fish capture and relocation activities pose a risk of injury or mortality to fish species. Fish collecting gear, whether passive (Hubert 1996) or active (Hayes *et al.* 1996) has some associated risk to fish, including stress, disease transmission, injury, or death. The amount of unintentional injury and mortality attributable to fish capture varies widely depending on the method used, the ambient conditions, and the expertise and experience of the field crew. Since fish relocation activities will be conducted by qualified fisheries biologists following both the CDFG and NMFS guidelines, direct effects to and mortality of steelhead and green sturgeon during capture will be minimized. Data from years of similar salmonid relocation activities indicate that average mortality rate is below one percent (Jeffrey Jahn, NMFS, personal communication, February 2011). Based on this information, NMFS will use 2 percent as the maximum amount of mortality likely from fish relocation for the project, or no more than one fish of both species.

Ideally sites selected for relocating fish should have ample habitat. However, because of the degraded habitat conditions in San Francisquito Creek, relocated fish may endure short-term stress from crowding at the relocation sites. Relocated fish may also face increased competition for available resources such as food and habitat. Some of the fish released at the relocation sites may choose not to remain in these areas and may move either upstream or downstream to areas that have more habitat and a lower density of fish. Because relocated fish will have the opportunity to quickly relocate into adjacent areas, thereby minimizing competition and crowding stress, NMFS does not believe relocation activities will reduce the fitness of individual fish.

B. Dewatering

The project will require channel dewatered during two to three consecutive dry seasons. A vast majority, if not all, of the water present during the summer months would be tidal waters. Waters will be diverted through the construction area in a large metal pipe. The total length of the dewatered channel will be approximately 450-500 feet. Once the diversion pipe and cofferdams are installed and operating, water and fish will be allowed to move through the pipe during construction.

Stream flow diversions could harm individual rearing steelhead or green sturgeon by concentrating them in residual wetted areas before they are relocated (Cushman 1985). Juvenile steelhead and green sturgeon that avoid capture in the project site prior to dewatering will likely die during dewatering activities due to desiccation or thermal stress. Due to the rarity of steelhead and green sturgeon presence at the site, the lack of hiding cover and the capture and relocation efforts, NMFS expects that no steelhead or green sturgeon will be stranded during the dewatering process. Also, during the dewatering process, the biologist on site will make every effort to collect and relocate any fish that avoided capture prior to the beginning of the dewatering process.

Another manner by which juvenile steelhead and green sturgeon may be harmed or killed during dewatering activities is to be entrained into pumps or discharge lines if these methods are used. To eliminate this risk, the applicant will screen all pumps according to NMFS criteria, to ensure juvenile steelhead and green sturgeon will not be harmed by the pumps during dewatering events.

Juvenile steelhead and green sturgeon rearing downstream of the action area may be inadvertently affected by the loss of benthic aquatic macroinvertebrate production within the dewatered area (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from dewatering will be temporary because construction activities will be relatively short-lived, drift from upstream will continue through the pipe, and rapid recolonization (about two to three months) of disturbed areas by macroinvertebrates is expected following construction (Cushman 1985, Thomas 1985, Harvey 1986). Also, once the proposed project is completed, there will be an increase in the amount of exposed channel bottom that will be colonized by additional invertebrates, thereby increasing overall invertebrate production within the action area. Based on the foregoing, the loss of aquatic macroinvertebrates as a result of dewatering activities and bank disturbances is not expected to adversely affect juvenile steelhead or green sturgeon downstream of the project area.

C. Turbidity

In-stream and near-stream construction activities may cause temporary increases in turbidity (reviewed in Furniss *et al.* 1991, Reeves *et al.* 1991, and Spence *et al.* 1996). NMFS anticipates only short-term increases in turbidity will occur during proposed activities (*e.g.,* construction and removal of cofferdams and the initial re-wetting of the channel following the removal of the diversion). High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelly 1961, Bjornn et al. 1977, Berg and Northcote 1985), reduce growth rates (Crouse et al. 1981), and increase plasma cortisol levels (Servizi and Martens 1992). High turbidity concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases, and can also cause fish mortality (Sigler *et al.* 1984, Berg and Northcote 1985, Gregory and Northcote 1993, Waters 1995). Even small pulses of turbid water will cause salmonids to disperse from established territories (Waters 1995), which can displace fish into less suitable habitat and/or increase competition and predation, decreasing chances of survival. Increased sediment deposition can fill pools and reduce the amount of cover available to fish, decreasing the survival of juveniles (Alexander and Hansen 1986).

Much of the research discussed in the previous paragraph focused on turbidity levels higher than those expected to occur during implementation of the proposed activities. Monitoring of newly replaced culverts within Humboldt County indicated temporary increases in turbidity following winter storm events in which the measured turbidity was generally less than the turbidity threshold commonly cited as beginning to cause minor behavioral changes (Henley *et al.* 2000), and always less than turbidity levels necessary to injure or kill salmonids. Impacts associated with degraded water quality will likely be limited to behavioral effects, such as temporarily vacating preferred habitat or temporarily reduced feeding efficiency. These temporary changes in behavior, may reduce growth rates, but are not likely to reduce the survival chances of individual juveniles. Caltrans has included BMPs to reduce the likelihood of sediments from entering the streams. NMFS assumes these actions will be effective at reducing sedimentation rates. The effects of the turbidity may extend to approximately 1,000 feet downstream of the construction area, but beyond that point, NMFS assumes that most suspended material will have settled or will be have been diluted by tidal waters. Therefore, any short-term impacts associated with turbidity during implementation of this project are expected to be insignificant.

D. Toxic Chemicals

Equipment refueling, fluid leakage, equipment maintenance, and road surfacing activities near the stream channel pose some risk of contamination of aquatic habitat and subsequent injury or death to listed salmonids. The applicant and its contractors propose to maintain any and all fuel storage and refueling site in an upland location well away from the stream channel; that vehicles and construction equipment be in good working condition, showing no signs of fuel or oil leaks, and that any and all servicing of equipment be conducted in an upland location. For instream construction activities, NMFS does not anticipate any localized or appreciable water quality degradation from toxic chemicals or adverse effects to steelhead or green sturgeon associated with the proposed project, as the stream will be dewatered, giving the applicant and its contractors ample opportunity to attend to any spill prior to toxic chemicals reaching the waters of San Francisquito Creek. NMFS anticipates proposed BMPs and responses by the applicant and its contractors to any accidental spill of toxic materials should be sufficient to restrict the effects to the immediate area and not enter the waterway.

E. Pile Installation

Available information indicates fish may be injured or killed when exposed to elevated underwater sound pressure waves generated from driving steel piles with impact hammers. Pathologies associated with very high sound levels are collectively known as barotraumas. These include hemorrhage and rupture of internal organs, including the swim bladder and kidneys in fish. Death can be instantaneous, occur within minutes after exposure, or occur several days later. High sound pressure levels can also result in hearing damage to fish (Hastings *et al.* 1995, 1996). Additional detrimental effects on fish from loud sounds include stress, increasing risk of mortality by reducing predator avoidance capability, and interfering with communication necessary for navigation and reproduction. Pile driving may result in "agitation" of salmonids and green sturgeon indicated by a change in swimming behavior detected by Shin (1995) with salmonids. Salmonids and green sturgeon may exhibit a startle response to the first few strikes of a pile.

Caltrans proposes to permanently install approximately 200 steel-cased piles and multiple sheet piles using a pile driver. Because the project site will be dewatered, no pile or sheet installation will occur in surface waters. Any surface waters will be diverted through the construction area in a rigid steel pipe, which will also accommodate daily tidal fluctuations. A pile driver will be used to install the steel-cased piles (partial install) and sheet piles. Approximately six to eight steel-cased piles will be installed per day. Pile driving is estimated to take approximately 30 work days and will occur approximately eight hours per day during the dry season (June 1-October 15) when CCC steelhead and southern DPS green sturgeon are anticipated to be rare in the action area. Impacts to either of these species would only occur if they happened to move through the diversion pipe during pile installation. Sound energy originating from the ground as a result of pile driving activities will be dominated by low frequencies, which do not propagate efficiently through water, and therefore would have less of an effect on fish within the diversion pipe.

NMFS considers the possibility of adverse effects to listed CCC steelhead and southern DPS of North American green sturgeon and their designated critical habitat during pile installation to be minimal, if any, because: (1) this work will be conducted during the dry season when both species are likely rare in the action area; (2) habitat conditions present at the site are poor, which further reduces the likelihood of either species being present; and (3) the channel in the action area will be dewatered with a diversion pipe, which would allow any fish present in or near the construction area to move away from the action; and (4) once pile driving is completed, underwater sound pressure waves will return to normal levels in the action area.

F. Habitat Loss

Approximately 0.72 acres (31,227 square feet) of designated critical habitat for both CCC steelhead and the southern DPS green sturgeon in San Francisquito Creek will be temporarily impacted due to the dewatering of the channel and the placement of cofferdams. This area consists primarily of open water, tidal channel habitat. The channel bottom is fairly uniform throughout this section and is only completely flooded during high tides. NMFS anticipates the temporary impacts associated with dewatering this area will not result in permanent adverse impacts to critical habitat or the species it supports because (1) fish will be relocated prior to dewatering; (2) the area to be dewatered represents a very small fraction of the total amount of tidal habitat available to the species; (3) water and fish will be allowed to pass through the diversion pipe while the; and (4) Caltrans will employ various BMPs and minimization measures to ensure impacts to the channel and the species will be avoided or minimized.

Temporary disturbances to upland habitats will also occur, however these areas are dominated by low-growing, non-native species, which currently provide little shade or cover within the creek. Therefore, NMFS assumes the disturbances to these upland areas will be insignificant with respect to effects on habitat for steelhead or green sturgeon.

Approximately 0.024 acres (1,061 square feet) of designated critical habitat for both CCC steelhead and the southern DPS green sturgeon in San Francisquito Creek will be permanently lost due to the project activities (*i.e.*, pier construction). This loss of habitat would occur in the open water areas of the lower river channel. Regardless of the poor habitat conditions at the site, the contribution of this small part of the action area as habitat space for migration (steelhead and green sturgeon) and as foraging habitat (green sturgeon) is insignificant and its loss is unlikely to diminish the value of critical habitat in the action area for steelhead and green sturgeon. In addition, the channel will be widened under the bridge, and eventually will provide additional habitat space for both species and channel bottom foraging habitat for green sturgeon as described below.

G. Interrelated and Interdependent Actions

The replacement of the U.S. Highway 101 Bridge over San Francisquito Creek would also include the addition of auxiliary lanes as a component of the U.S. Highway 101 Auxiliary Lanes-Embarcadero Road to Marsh Road Project. As a separate project, Caltrans will construct auxiliary lanes in both directions by widening U.S. Highway 101 between the Embarcadero Road interchange in the City of Palo Alto to the Marsh Road interchange in the City of Menlo Park (Caltrans 2008). The new U.S. Highway 101 Bridge will be constructed to satisfy the lane requirements of the U.S. Highway 101 Auxiliary Lanes-Embarcadero Road to Marsh Road Project.

Caltrans will combine the Auxiliary Lanes Project with the U.S. Highway 101 Bridge replacement project during construction in order to minimize conflicts between the two projects due to their proximity, and the need to share lanes on U.S. Highway 101 during construction to allow traffic to move through the work zone. Caltrans determined the Auxiliary Lanes Project would have no effect on the environment including biological species or hydrology (Caltrans 2008). After reviewing the proposed Auxiliary Lanes Project (Caltrans 2008), NMFS agrees that the project is not likely to affect ESA-listed species or their designated critical habitat because the project activities will only occur in upland areas, far enough away from San Francisquito Creek to prevent sediments or other disturbances from entering salmonid or green sturgeon waters.

H. Beneficial Effects

The proposed lengthening of the three parallel bridges will result in a wider creek channel, which will allow for more natural high flow conditions and an increase in channel bottom habitat. Currently, the steep banks support predominantly non-native species that provide little shade or cover. However, tidal slough channels are known to be utilized by juvenile green sturgeon as foraging habitat. Therefore, the increase in exposed channel bottom habitat resulting from the widening of the bridge will result in an increase in the amount of this habitat type available for juvenile green sturgeon.

VII. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Caltrans and NMFS are not aware of any future State or private activities that are reasonably certain to affect species and habitats within the action area. During the time frame of the proposed project, two to three years, natural environmental fluctuations are likely to obscure any impacts from climate change (Cox and Stephenson 2007, Smith *et al.* 2007). Therefore, NMFS does not expect cumulative impacts from climate change in the action area will be observable during the proposed project.

VIII. INTEGRATION AND SYNTHESIS

After reviewing the information available, NMFS anticipates only a small number of juvenile and/or smolt CCC steelhead and juvenile southern DPS green sturgeon (less than 20 individuals of either species) may be affected by the project, and no more than one individual of either species will perish. This is due to the low expected abundance of fish and the relocation efforts prior to dewatering and construction and the low injury and mortality rates expected from fish collection methods. Based on the time of year that the project will be implemented, the creek's hydrograph (*i.e.*, the channel typically goes intermittent by end of spring), and recent juvenile abundance estimates in portions of the upper watershed, NMFS believes that the number of juvenile steelhead potentially affected by the proposed project would likely be very small and would represent a small fraction of the total number of juveniles in the entire San Francisquito Creek watershed. NMFS anticipates only a few, if any, steelhead smolts are likely to be encountered because the project will start at the end of the smolt out-migration period, and therefore a majority of the smolts would have already migrated downstream of the action area to the Bay. Although estimates of smolt abundance do not exist for the San Francisquito Creek Watershed, based on the available juvenile abundance data described above, NMFS does not expect the potential loss of one smolt to impact future adult returns/abundance in the San Francisquito Creek Watershed or jeopardize the continued existence of the DPS.

Similarly, NMFS anticipates the number of juvenile southern DPS green sturgeon affected by the proposed activities to be very small, if any. Due to their higher fecundity (60,000-140,000 eggs), large numbers of juvenile green sturgeon can be produced in one spawning event. Therefore the loss of up to one juvenile southern DPS green sturgeon as a result of the proposed activities is not likely to impact the future abundance of the species in the area or the continued existence of the DPS.

NMFS anticipates short-term increases in turbidity will occur during dewatering activities. These impacts will be temporary, and NMFS anticipates proposed BMPs will control sediment and other pollutants sufficiently to avoid significant adverse effects to listed fish species. No permanent adverse changes in stream flow are anticipated. Therefore, NMFS believes the effects of turbidity increases and flow conditions from the project activities will not have any long-term impacts to the PCEs of CCC steelhead or southern DPS green sturgeon habitat. The value of critical habitat in the action area for species conservation is not likely to be appreciably reduced by the activities proposed in this project.

IX. CONCLUSION

After reviewing the best available scientific and commercial information, the current status of the species and critical habitat, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is NMFS' biological opinion the replacement of the U.S. Highway 101 Bridge over San Francisquito Creek, is not likely to jeopardize the continued existence of threatened CCC steelhead and threatened southern DPS green sturgeon

After reviewing the best available scientific and commercial information, the current status of the critical habitat, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is NMFS' biological opinion the replacement of the U.S. Highway 101 Bridge over San Francisquito Creek, is not likely to destroy or adversely modify designated critical habitat for threatened CCC steelhead and threatened southern DPS green sturgeon.

X. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS as an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement. Caltrans will adhere to the Term and Conditions detailed in this section of the biological opinion and other BMPs discussed in the biological assessment for the entirety of the project.

The measures described below are nondiscretionary, and must be undertaken by Caltrans, for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans (1) fails to assume and implement the terms and conditions or (2) fails to require their designee(s) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Caltrans must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement (50 CFR §402.14(i)(3)).

A. Amount or Extent of Take

As described above in the accompanying biological opinion, the number of threatened CCC steelhead and threatened southern DPS green sturgeon that may be incidentally taken by capture and relocation during project activities is expected to be small (less than 20 individuals of either species per year, for a total of 60 individuals over three years) relative to the number of each species present throughout the San Francisquito Creek Watershed (steelhead) and southern San Francisco Bay (green sturgeon). NMFS anticipates no more than two percent annually of the juvenile CCC steelhead and/or southern green sturgeon present in the area to be dewatered will be killed during relocation and dewatering efforts (no more than 1 fish per species).

The anticipated take will have been exceeded if more than 20 juvenile and/or smolt steelhead and/or 20 juvenile green sturgeon are captured or if more than 1 fish of either species is killed during relocation efforts.

B. Effect of the Take

In the accompanying opinion, NMFS determined this level of anticipated take is not likely to result in jeopardy to either species.

C. Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize and monitor the impacts of the anticipated incidental take of CCC steelhead and southern DPS of North American green sturgeon:

1. Undertake measures to ensure harm and mortality to CCC steelhead and southern DPS green sturgeon resulting from fish relocation and dewatering activities is low.

2. Undertake measures to maintain water quality at pre-construction levels to avoid or minimize harm to CCC steelhead and southern DPS green sturgeon.

3. Prepare and submit a report to document the effects of construction and relocation activities and performance.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, Caltrans, its permittee, and their designees must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

<u>The following terms and conditions implement Reasonable and Prudent Measure 1, to minimize harm or mortality to listed steelhead and green sturgeon from fish relocation and dewatering activities</u>.

1. Caltrans shall provide a list of all BMP's and the Terms and Conditions of this biological opinion to their contractors and ensure they are followed for the length of the project.

2. Caltrans shall provide NMFS with a Fish Relocation Plan for review 30 days prior to the start of dewatering and fish relocation activities and shall outline all confirmed fish relocation methods, including the location and a description of the habitat where steelhead and green sturgeon are to be relocated. The plan shall be submitted to NMFS' North Central Coast Office (see address below).

3. The project biologist shall notify NMFS biologist Joel Casagrande at (707) 575-6016 or Joel.Casagrande@noaa.gov one week prior to relocation activities in order to provide an opportunity for NMFS staff to observe the activities.

4. The biologist will note the number of each species observed in the affected area, the number of fish relocated, and the date and time of collection and relocation. If any dead or fatally wounded fish are observed, they will be collected and placed in an appropriately sized whirl-pack or zip-lock bag, labeled with the date and time of collection, fork length, and location of capture, and frozen as soon as possible.

5. All live steelhead and green sturgeon shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, and aerated water that is protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish shall not be removed from this water except when released. If necessary, the biologist shall have at least two containers and segregate young-of-year salmonids from older salmonids and other potential aquatic predators in order to avoid predation affects. Captured steelhead and green sturgeon shall be relocated as soon as possible and will be given highest priority over other non-listed fish species. Both juvenile steelhead and green sturgeon will be released downstream of the project area.

<u>The following terms and conditions implement Reasonable and Prudent Measure 2, undertake measures to maintain water quality at pre-construction levels to avoid or minimize harm to CCC steelhead and southern DPS green sturgeon</u>.

6. Caltrans shall monitor in-channel activities and performance of sediment control or detention devices for the purpose of identifying and reconciling any condition that could result in take of listed salmonids.

7. Caltrans shall provide NMFS with a copy of the project's site specific Storm Water Pollution Prevention Plan (SWPPP) or applicable plan(s), which specifies BMPs to control mobilization of sediment from the project. If BMPs must be modified, or when additional BMPs are implemented, the SWPPP will be updated to reflect needed changes. Documents shall be submitted to NMFS North Central Coast Office (see address below).

8. Construction work shall not create conditions that mobilize sediment or concentrate over-land flow from construction areas into the creek, or other channels leading directly to the creek.

<u>The following terms and conditions implement Reasonable and Prudent Measure 3, prepare and submit a report to document the effects of construction and relocation activities and performance.</u>

9. Caltrans shall provide NMFS with a summary report by January 15 of each year following the completion of fish relocation and monitoring activities. The report shall include the methods used during the fish relocation and monitoring efforts, location, number and species captured, number of mortalities by species, and other

pertinent information related to the monitoring and fish relocation activities. Reports shall be submitted to NMFS North Central Coast Office (see address below).

10. Caltrans or its contractor shall allow any NMFS employee(s) or any other person(s) designated by NMFS, to access the work area during the construction period for the purpose of observing monitoring activities, evaluating fish and stream conditions, monitoring performance of Caltrans BMPs, monitoring water quality, collecting fish samples, or perform other monitoring/studies. NMFS will notify the Caltrans Resident Engineer 48 hours prior to planning a site visit and will contact Caltrans personnel prior to entering the construction site.

11. All reports or plans required for the above terms and conditions shall be sent to:

NMFS North Central Coast Office
Central Coast Branch Supervisor, Protected Resources Division
Southwest Region
National Marine Fisheries Service
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404

XI. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, or to develop information.

1. NMFS recommends Federal Highway Administration (FHWA) and Caltrans consult with NMFS to develop a long range planning approach that seeks to minimize and avoid the impacts of road-related projects on listed salmonids and green sturgeon.

2. Caltrans should identify and prioritize any maintenance and construction projects which, if implemented, can improve ESA-listed salmonid migration or in-stream environmental conditions.

XII. REINITIATION NOTICE

This concludes formal consultation for the proposed replacement of U.S. Highway 101 Bridge over San Francisquito Creek along the San Mateo County and Santa Clara County boundary. As provided in 50 CFR §402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

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XIV. PERSONAL COMMUNICATION CITED

Jeffrey Jahn, NMFS, personal communication, November 2010 and February 2011.

David Woodbury, NMFS, personal communication, December 21, 2010

Dr. Jerry Smith, SJSU, personal communication, December 7, 2010

Enclosure 2

United States (U.S.) Highway 101 San Francisquito Creek Bridge Replacement Project
Santa Clara and San Mateo Counties, California

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION

Statutory and Regulatory Information

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, establishes a national program to manage and conserve the fisheries of the United States through the development of federal Fishery Management Plans (FMPs), and federal regulation of domestic fisheries under those FMPs, within the 200-mile U.S. Exclusive Economic Zone ("EEZ"). 16 U.S.C. §1801 *et seq*. To ensure habitat considerations receive increased attention for the conservation and management of fishery resources, the amended MSA required each existing, and any new, FMP to "describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 1855(b)(1)(A) of this title, minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat." 16 U.S.C. §1853(a)(7). Essential Fish Habitat (EFH) is defined in the MSA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" 16 U.S.C. §1802(10). The components of this definition are interpreted at 50 C.F.R. §600.10 as follows: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

Pursuant to the MSA, each federal agency is mandated to consult with NMFS (as delegated by the Secretary of Commerce) with respect to any action authorized, funded, or undertaken, or proposed to be, by such agency that may adversely affect any EFH under this Act. 16 U.S.C. §1855(b)(2). The MSA further mandates that where NMFS receives information from a Fishery Management Council or federal or state agency or determines from other sources that an action authorized, funded, or undertaken, or proposed to be, by any federal or state agency would adversely affect any EFH identified under this Act, NMFS has an obligation to recommend to such agency measures that can be taken by such agency to conserve EFH. 16 U.S.C. §1855(4)(A). The term "adverse effect" is interpreted at 50 C.F.R. §600.810(a) as any impact that reduces quality and/or quantity of EFH and may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce quantity and/or quality of EFH. In addition, adverse effects to EFH may result from actions occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

If NMFS determines that an action would adversely affect EFH and subsequently recommends measures to conserve such habitat, the MSA proscribes that the Federal action agency that receives the conservation recommendation must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations. 16 U.S.C. §1855(b)(4)(B).

Background and Consultation History

On November 18, 2010, NMFS received the California Department of Transportation's letter requesting initiation of formal consultation under Section 7 of the Endangered Species Act for replacement, widening, and lengthening of the U.S. 101 bridge over San Francisquito Creek and widening of the channel between Santa Clara and San Mateo Counties, California. The Caltrans letter did not initiate consultation under MSA; however NMFS has determined that the proposed actions do occur in areas identified as EFH for various life stages of fish species managed with the following Fishery Management Plans (FMP) under the MSA: Pacific Groundfish FMP, Coastal Pelagics FMP, and the Pacific Salmon FMP.

Proposed Action

The proposed action is described in detail in the preceding biological opinion (BO). The current U.S. Highway 101 Bridge will be replaced with a bridge 44 feet longer and 14 feet wider to accommodate channel widening and auxiliary lanes. The East Bayshore bridge (80 feet long and 38 feet wide) and West Bayshore bridge (80 feet long and approximately 35 feet wide) run adjacent to U.S Highway 101 Bridge and cross over the creek on the same pier walls (*i.e.*, bridge supports) and will also be replaced with longer, wider bridges, 126 feet long by 44 feet wide each. The creek channel beneath the bridge will be widened to coordinate with a separate major flood control project proposed by the San Francisquito Creek Joint Powers Authority (SFCJPA) to accommodate an increase in creek flow based on the 100-year flood projections.

An in-channel work window of June 1 through October 15 will be observed over 2 or 3 years of bridge demolition and construction. During this time, approximately 450-500 feet of San Francisquito Creek will be dewatered using sheet-pile cofferdams with a large corrugated pipe for diversion of stream flow and tidal water and for fish passage. The bridge replacement involves demolishing the existing U.S. Highway 101 Bridge over San Francisquito Creek, including the bridge deck and two existing pier walls, installation of

200 16- inch diameter piles; installation of sheet piles at five locations for temporary wing-walls and creek bank stabilization; replacement of two pier walls that support the bridge and divide the channel beneath San Francisquito Creek into three flow “cells”. Due to the widening of the channel and the lengthening of the bridge, a third pier wall will be built to create a 4th flow cell, to remain isolated from full stream flow until the SFCJPA flood control project widens the channel upstream and downstream. In order to equalize pressure from water against the new pier wall, temporary screened openings will be made in the new pier wall. The openings will be screened with 3/32 inch mesh to keep fish and other organisms from accessing this new cell, preventing entrainment.

BMPs and conservation measures include the following:

- Water pumped from the creek prior to and/or during construction of the bridge will be stored in tanks pending water quality analysis.

- Soil stabilization measures, sediment control, waste management, and pollution control BMPs will be implemented to prevent sediment and other pollutants from entering the channel during project construction to minimize the potential for impacts to water quality in San Francisquito Creek.

- Netting or suspended debris racks will be used during demolition to minimize the amount of debris falling into the creek channel and onto the water diversion pipe.

- Temporary materials in the channel, including the falsework, cofferdams, and the creek diversion pipe will be removed at the end of each dry season and the end of the project.

- Once the SFCJPA flood protection project is completed, all of the sheet piles will be removed and the fourth flow cell will become fully accessible.

The BMPs and conservation measures described here and in the consultation initiation package as parts of the proposed action are effective to reduce or avoid adverse effects to EFH. The NMFS regards these conservation measures as integral components of the proposed action and expects that all proposed activities will be completed consistent with those measures. We have completed our effects analysis accordingly. Any deviation from these conservation measures will be beyond the scope of this consultation and may require supplemental consultation to determine what effect the modified action is likely to have on EFH.

<u>Action Area</u>

For purposes of this EFH consultation, the action area occurs within the channel of San Francisquito Creek in a heavily urbanized area between University Avenue and Embarcadero Road, along the U.S. Highway 101 corridor. The length of the dewatered channel will extend approximately 450-500 feet in the area of the existing U.S. Highway

101 Bridge. San Francisquito Creek is designated EFH for federally-managed Coho within Pacific Salmon FMP as Coho salmon have been identified as historically occurring in San Francisquito Creek (Leidy 2005). The project site is within the tidally influenced portion of San Francisquito Creek thus EFH for the Coastal Pelagic and Pacific Groundfish FMPs may also be affected.

Effects of the Action

Based on information provided in the Biological Assessment and developed during consultation, NMFS concludes that the proposed action would adversely affect EFH for various federally managed species within the Pacific Groundfish FMP, Coastal Pelagics FMP, and the Pacific Salmon FMP. The proposed bridge replacement and expansion could adversely affect EFH, including estuary HAPC due to: (1) temporary turbidity/siltation effects, (2) temporary elevated levels of underwater sound, (3) temporary and permanent loss of subtidal habitat, and (4) permanent increase of shaded areas.

In-water construction activities are expected to temporarily increase turbidity within the creek channel during construction and removal of cofferdams and the initial re-wetting of the channel. Fish may suffer reduced feeding ability (Benfield and Minello 1996) and be prone to fish gill injury (Nightingale and C.A. Simenstad 2001) if exposed to excessive high levels of turbidity. Caltrans has included BMPs for sediment control to minimize impacts to water quality in San Francisquito Creek and fish are expected to move out of areas of high suspended sediment.

As described in the BO, fish can be injured or killed when exposed to elevated underwater sound pressure waves generated from pile driving. However, pile driving proposed for the project will occur in dewatered areas of the construction site and levels of sound in adjacent waters are not expected to exceed NMFS' single strike or cumulative threshold for fish injury. However, low frequency sound transmitted through the ground to adjacent waters and into the diversion pipe over 30 work days may cause fish to leave the area temporarily.

Approximately 0.72 acres of open-water estuarine EFH in San Francisquito Creek will be repeatedly disturbed and temporarily inaccessible to fish while the channel is dewatered for bridge demolition and construction. During this time, fish will be able to move through the work area in the diversion pipe only. The fine grain sediment that is characteristic of the creek bed in the project area is considered good foraging habitat for fish, providing a substrate for infaunal and bottom-dwelling organisms, such as polychaete worms, crustaceans, and other EFH prey types (NMFS 2007). Thus, forage resources for fish that feed on the benthos may be reduced during the 2 to 3 years of construction. However, this temporary loss and significant disturbance of benthic habitat occurs over a relatively small area and may be offset long-term by the increased open-water area from channel widening.

Installation of the new bridge will result in the permanent fill of 0.024 acres of EFH in San Francisquito Creek due to construction of pier walls and abutments for the new bridge. Only a fraction of this (from lengthened pier walls and one additional pier wall) will be an increase to the permanent structures already in place from the existing bridge and is not considered a significant increase.

Bridge expansions will result in approximately 1300 square feet of additional shaded area. Shading is known to decrease primary productivity, alter predator-prey interactions, change invertebrate assemblages, and reduce the density of benthic invertebrates (Helfman 1981; Glasby 1999; Struck, Craft et al. 2004; Stutes, Cebrian et al. 2006); all of which lead to an overall reduction in the quality of EFH. Effects of shading are expected to be minor given that there is only a small net increase in shaded area and additional shading occurs in an urbanized section of creek where overwater structures already exist. In addition, the proposed channel widening included in the project will increase open water habitat and is expected to offset impacts associated with the increase in shading.

EFH Conclusion

As described in the above effects analysis, NMFS has determined that the proposed project would adversely affect EFH for various federally-managed species within the Pacific Groundfish, Coastal Pelagic, and Pacific Salmonid FMPs. As described above, the adverse effects are expected to be temporary and may be offset by channel widening. Furthermore, the proposed action contains adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. With the terms and conditions set forth in the preceding BO, NMFS has no additional EFH Conservation Recommendations to provide. This concludes EFH consultation for the proposed replacement, widening, and lengthening of the U.S. 101 bridge over San Francisquito Creek and widening of the channel between Santa Clara and San Mateo Counties, California.

Supplemental Consultation

Pursuant to 50 CFR 600.920(l), Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conclusion.

LITERATURE CITED

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DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT
2424 Arden Way, Suite 125
Sacramento, California 95825
doshM&Tsac@dir.ca.gov

Telephone (916) 574-2540
FAX (916) 574-2542

May 9, 2013

Calif. Dept. of Transportation
P O Box 23660
Oakland, CA 94623-0660

Attention: Duat Nguyen, Branch Chief, Project Development Peninsula

Subject: Underground Classification No. **C100-081-13T** and **C101-081-13T**
Classification: Potentially Gassy With Special Conditions
Project: San Francisquito Creek Bridge Replacement

The information provided to this office relative to the above project has been reviewed. On the basis of this analysis, Underground Classifications of "Potentially Gassy With Special Conditions" have been assigned to the tunnels identified on your submittal. Please retain the original Classifications for your records and deliver a true and correct copy of each Classification to the tunnel contractor for posting at the job site.

When the contractor who will be performing the work is selected, please advise them to notify this office to schedule the mandated Pre-Job Conference with the Division prior to commencing any activity associated with boring of the tunnel(s). A Pre-Job Request Form is enclosed.

Should you have another bore under construction that is not required to have an Underground Classification (i.e.: less than 30 inches in diameter), please contact the Mining and Tunneling Unit prior to any employee entry of such a space.

If you have any questions on this subject, please contact this office at your earliest convenience.

Sincerely,

Douglas Patterson
Senior Engineer

enc: Classifications
Pre-Job Request Form

cc: R.Brockman

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C100-081-13T **CALIF. DEPT. OF TRANSPORTATION**

of **P O BOX 23660; OAKLAND, CA 94623-0660**

at **SAN FRANCISQUITO CREEK BRIDGE REPLACEMENT**

has been classified as ***** POTENTIALLY GASSY WITH SPECIAL CONDITIONS *****

as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

Airborne lead deposited in surface soils.

Eleven 30-inch-diameter, 43-foot-deep drilled shafts alongside the north shoulder of Highway 101 located approximately 2,000 feet north of the Embarcadero Road overcrossing of Highway 101, in Palo Alto, San Mateo County.

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

May 9, 2013

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C101-081-13T **CALIF. DEPT. OF TRANSPORTATION**

of **P O BOX 23660; OAKLAND, CA 94623-0660**

at **SAN FRANCISQUITO CREEK BRIDGE REPLACEMENT**

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*****SPECIAL CONDITIONS*****

1. **A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.**
2. **Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.**
3. **The Division shall be notified immediately if any Flammable Gas or Petroleum Vapor exceeds 5% of the Lower Explosive Limit.**
4. **All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.**

Airborne lead deposited in surface soils.

Five 30-inch-diameter, 44-foot-deep drilled shafts alongside the south shoulder of Highway 101 located approximately 2,000 feet north of the Embarcadero Road overcrossing of Highway 101, in Palo Alto, San Mateo County.

This classification shall be conspicuously posted at the place of employment.

Douglas Patterson, Senior Engineer

May 9, 2013

State of California
Department of Industrial Relations
Division of Occupational Safety & Health

PRE-JOB REQUEST

ATTACH COPY OF CLASSIFICATION AND DIESEL PERMIT

Company Name:____________________________________

Phone____________________ FAX:____________________

DATE FAXED: ____________________

PLEASE NOTE: THE BORING CONTRACTOR SHOULD SCHEDULE THE PREJOB AS FAR IN ADVANCE AS POSSIBLE - AT LEAST 3-4 DAYS IN ADVANCE. THE DIVISION REQUIRES THE JOB TO BE SET UP WHEN THE FIELD ENGINEER ARRIVES FOR THE PREJOB. THIS MEANS THAT THE BORE PIT HAS BEEN DUG AND PROPERLY GUARDED, THE CRANE IS IN PLACE AND READY TO LIFT, THE BORING MACHINE IS IN THE PIT AND READY TO GO, AND THE CREW IS READY TO BEGIN BORING THE TUNNEL. IF THERE IS A DELAY IN SETTING UP THE JOB, THE BORING CONTRACTOR SHOULD CONTACT THE DIVISION IMMEDIATELY.

PRE-JOB REQUEST DATE & TIME: ____________________

ON-SITE SUPERVISOR & CELL NO.: ____________________

CLASSIFICATION #: __________ **DIESEL PERMIT #:** __________

BORE DIAMETER AND LENGTH: __________ (Diameter) __________ (Length)

IS BORE ENTRY ANTICIPATED? **YES** **NO**
(Circle One)

You MUST contact the Division if entry is planned, REGARDLESS of the bore diameter.

MANNER OF EXCAVATION: ____________________

____

JOB-SITE LOCATION AND DIRECTIONS: ____________________

____

____

GENERAL CONTRACTOR: ____________________

SUBMITTED BY: ____________________

REVIEWED BY: ____________________ **DATE:** __________

- ☐ *Mining & Tunneling Unit, District 1*
  2424 Arden Way, Suite 125
  Sacramento, California 95825-2400
  (916) 574-2540; ***FAX: (916) 574-2542***
- ☐ *Mining & Tunneling Unit, District 2*
  6150 Van Nuys Blvd., Suite 310
  Van Nuys, California 91401-3333
  (818) 901-5420; ***FAX: (818) 901-5579***
- ☐ *Mining & Tunneling Unit, District 3*
  464 West Fourth Street, Suite 354
  San Bernardino, California 92401-1442
  (909) 383-6782; ***FAX: (909) 388-7132***

WATER QUALITY INFORMATION HANDOUT
CONTRACT NO. 235624

San Francisquito Creek Bridge Replacement
Santa Clara County Highway 101
04-SCL-101-PM 0.0/0.0

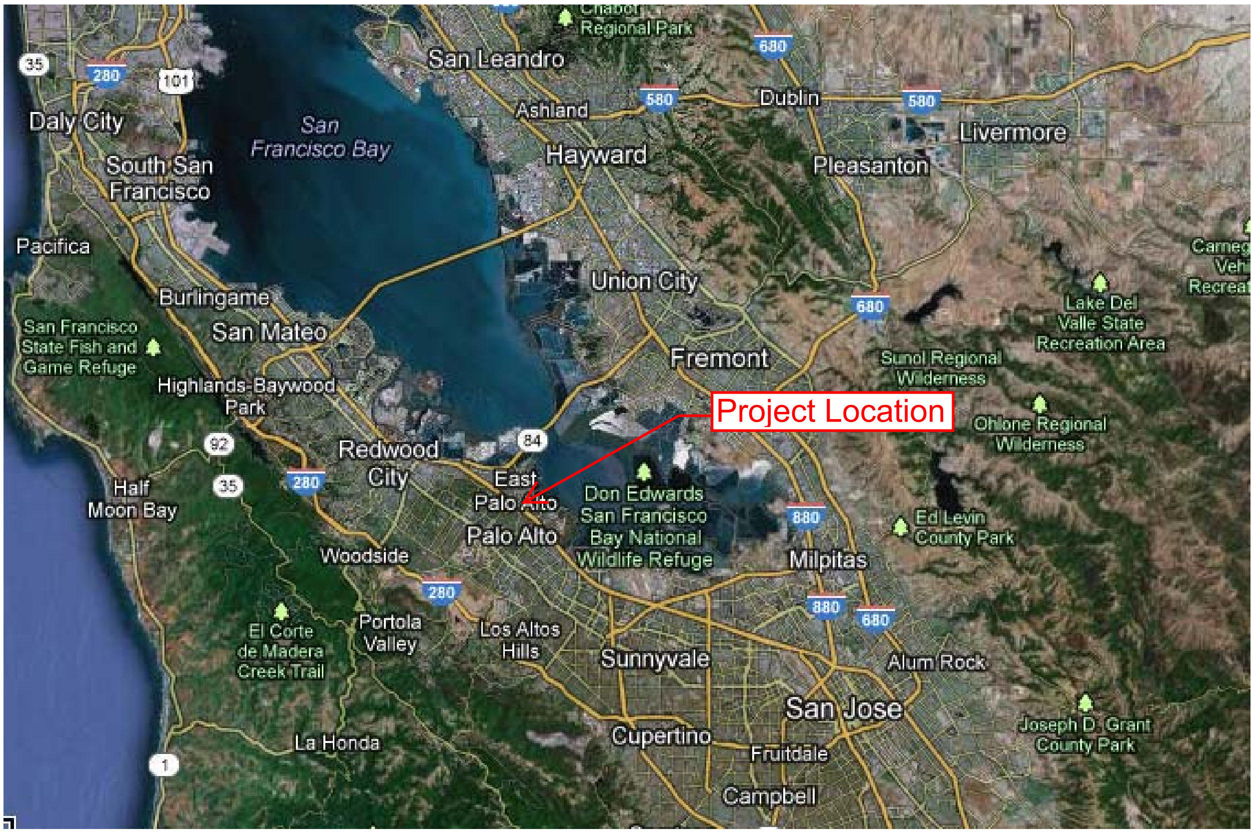
California Department of Transportation
District 4, 111 Grand Avenue
Oakland, CA 94612

Storm Water Information

Disclaimer

A “Disclaimer” is required specifying that the information provided in the Storm Water Information Handout is just a guideline and is to be used for information purposes only and should not be considered a sole source document to adhere to the requirements of the new National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), Number CAS000002, adopted on September 2, 2009. The contractor is required to provide water quality monitoring, sampling and implement best management practices (BMPs) based on standard industry operations, field conditions and conditions encountered based on the contractor’s means and methods. The information in this handout is not to be construed in any way as a waiver of the provisions in the CGP. Bidders and contractors are cautioned to make independent investigations and examinations as they deem necessary to satisfy the conditions encountered in performance of work, with respect to the following: sampling and monitoring locations, distribution of watershed areas for sizing of BMPs, and selection of BMPs in order to conform to the requirement of the contract documents and the CGP.

Project Vicinity


Project Location
San Francisco Bay
Daly City
South San Francisco
Pacifica
Burlingame
San Mateo
San Francisco State Fish and Game Refuge
Highlands-Baywood Park
Half Moon Bay
Redwood City
East Palo Alto
Palo Alto
Woodside
Portola Valley
El Corte de Madera Creek Trail
Los Altos Hills
La Honda
San Leandro
Chabot Regional Park
Ashland
Hayward
Dublin
Pleasanton
Livermore
Union City
Fremont
Don Edwards San Francisco Bay National Wildlife Refuge
Milpitas
Sunnyvale
Cupertino
San Jose
Fruitdale
Campbell
Alum Rock
Sunol Regional Wilderness
Ohlone Regional Wilderness
Ed Levin County Park
Lake Del Valle State Recreation Area
Joseph D. Grant County Park
35
280
101
92
84
880
680
580
1

Risk Assessment

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		89.07
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.32
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		0.36
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**	10.260864	
16	**Site Sediment Risk Factor**	**Low**	
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet	Entry
A. Watershed Characteristics	**yes/no**
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml **OR** A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml	**yes**

Region 1 Basin Plan

Region 2 Basin Plan

Region 3 Basin Plan

Region 4 Basin Plan

Region 5 Basin Plan

Region 6 Basin Plan

Region 7 Basin Plan

Region 8 Basin Plan

Region 9 Basin Plan

Combined Risk Level Matrix

<table>
<tr><td></td><td></td><th colspan="3">Sediment Risk</th></tr>
<tr><td></td><td></td><th>Low</th><th>Medium</th><th>High</th></tr>
<tr><th rowspan="2">Receiving Water Risk</th><th>Low</th><td>Level 1</td><td colspan="2">Level 2</td></tr>
<tr><th>High</th><td colspan="2">Level 2</td><td>Level 3</td></tr>
</table>

Project Sediment Risk:	**Low**
Project RW Risk:	**High**
Project Combined Risk:	**Level 2**

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

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:	05/20/2015
End Date:	11/28/2017
Latitude:	37.4528
Longitude:	-122.1278

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF **89.07** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **05/20/2015** - **11/28/2017**.

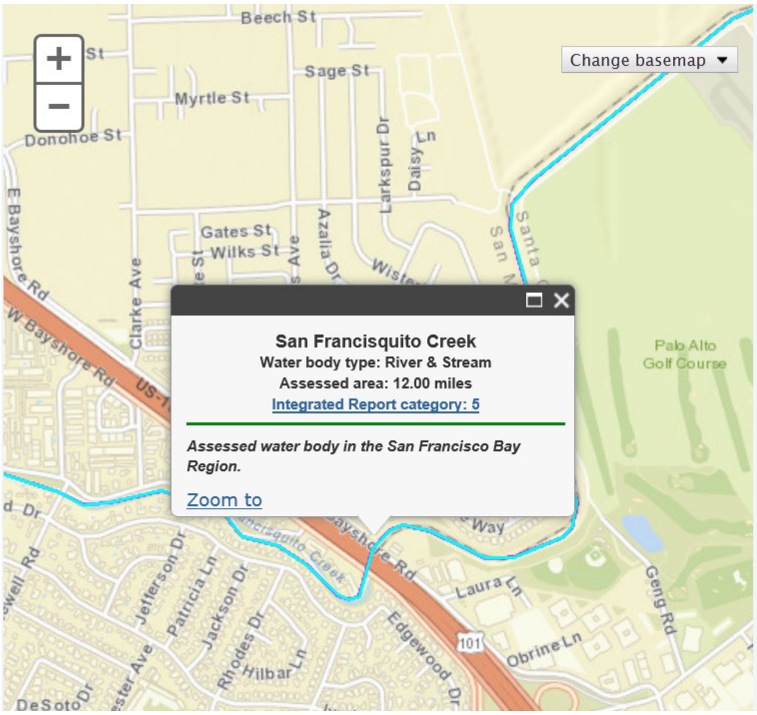
A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do NOT qualify for a waiver from NPDES permitting requirements**.

Start Over

Last updated on Monday, July 28, 2014

Receiving Water Risk (High)

San Francisquito Creek is a 303(d) listed waterbody impaired by sediment. It is a waterbody with three designated beneficial uses of COLD/SPAWN/MIGRATORY. Therefore, the receiving water body is High.



Pollutant assessments

Pollutants	Listing Decision / Report Link / Potential Sources / Schedule / *Comments*
pH	(d) list (TMDL required list) 4305 Source Unknown
Sedimentation/Siltation	List on 303(d) list (TMDL required list) 6457 Nonpoint Source Est. TMDL completion: 2013 *Impairment to steelhead habitat.*
Trash	List on 303(d) list (TMDL required list) 7655 Illegal dumping, Urban Runoff/Storm Sewers Est. TMDL completion: 2021

COUNTY Waterbody	AGR	MUN	FRSH	GWR	IND	PROC	COMM	SHELL	COLD	EST	MAR	MIGR	RARE	SPWN	WARM	WILD	REC-1	REC-2	NAV
San Francisco Bay South					E		E	E		E		E	E	E		E	E	E	E
ALAMEDA & SANTA CLARA COUNTIES																			
Newark Slough										E			E			E	E	E	
Plummer Creek (Zone 5 Line F-1)										E			E			E	E	E	
Mowry Slough										E			E			E	E	E	
Coyote Slough										E			E			E	E	E	
Mud Slough										E			E			E	E	E	
Laguna Creek (Arroyo la Laguna, or Zone 6 Line E)															E	E	E	E	
Mission Creek (Zone 6 Line L)															E	E	E	E	
Lake Elizabeth									E					E	E	E	E*	E	
Sabrecat Creek (Zone 6 Line K)															E	E	E	E	
Canada del Aliso (Zone 6 Line J)															E	E	E	E	
Agua Caliente Creek (Alameda) (Zone 6 Line F)															E	E	E	E	
Agua Fria Creek (Zone 6 Line D)															E	E	E	E	
Stivers Lagoon (Fremont Lagoon)			E												E	E	E	E	
Mallard (Artesian) Slough										E			E			E	E	E	
Scott Creek (Zone 6 Line A)															E	E	E	E	
Toroges Creek (Zone 6 Line C)													E		E	E	E	E	
SAN MATEO AND SANTA CLARA COUNTIES																			
San Francisquito Creek									E			E		E	E	E	E	E	

Rainfall Data

Rainfall Intensity can be obtained by the following link:

http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif

Refer to chapters 800, Highway Drainage Design of Highway Design Manual for information on runoff coefficient and shed map. The weighted runoff coefficient of 0.55 is recommended for the project area.

Conceptual Sampling Locations

(The actual sampling locations should be determined by Contractor on the field based on field conditions, construction activities, and construction phases)

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI,SM	101	52.0/52.6, 0.0/0.6	12	182

REGISTERED CIVIL ENGINEER 3/28/13 DATE

10-28-13
PLANS APPROVAL DATE

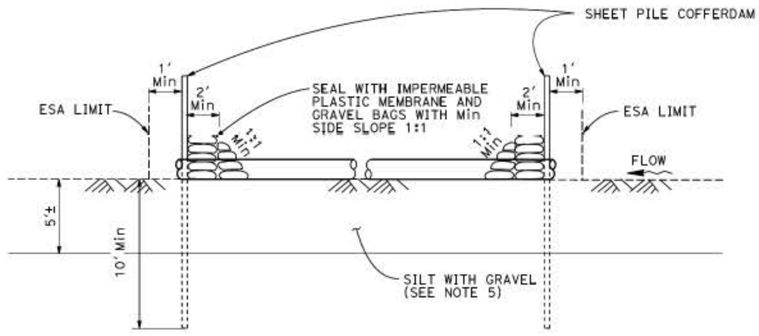
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER Jiangfan Chen No. 77248 Exp 6-30-15 CIVIL STATE OF CALIFORNIA

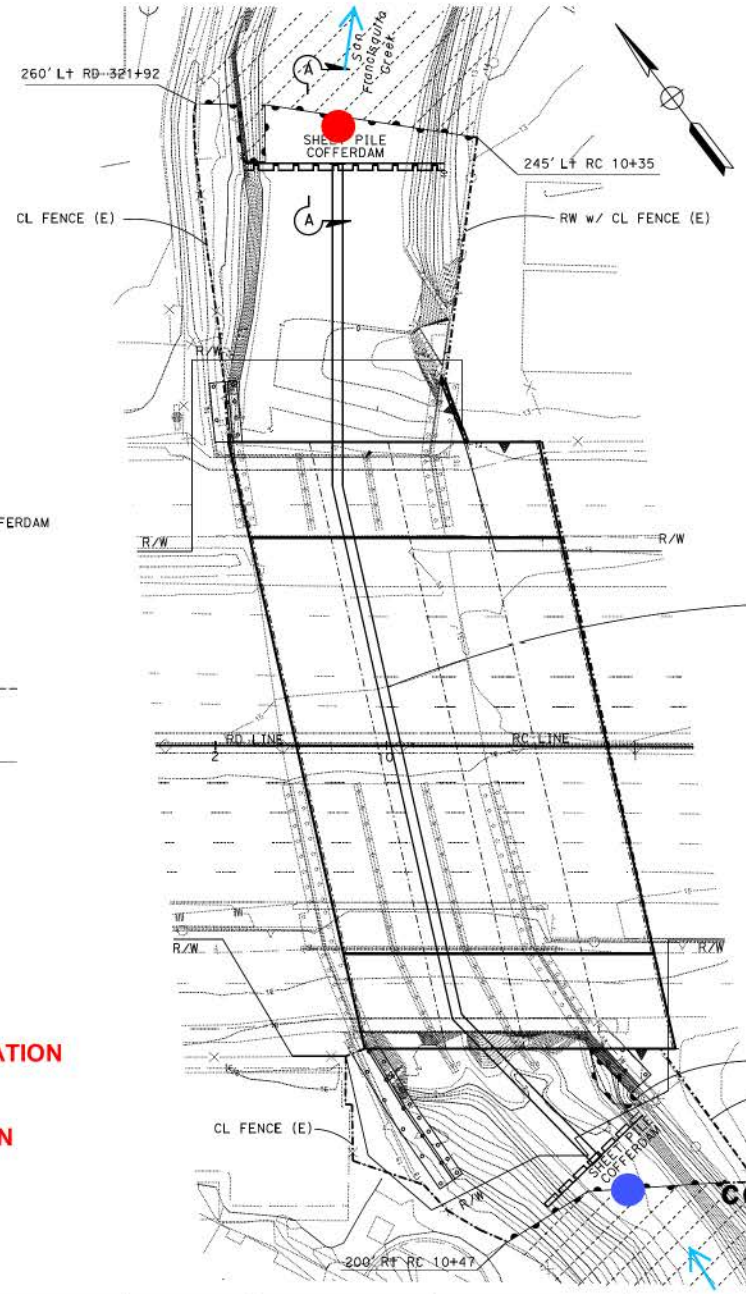
WATER QUALITY SAMPLING

NOTES

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. MAXIMUM CREEK BASE FLOW 30 CFS.
3. HIGHEST OBSERVED 5 YEAR TIDE Elev 6.75 NGVD29.
4. MAXIMUM SOIL BEARING CAPACITY IS 0.25 TON/SQFT.
5. SEE STRUCTURE PLANS FOR LOG OF TEST BORINGS.
6. COFFERDAM AND PIPE LOCATIONS ARE APPROXIMATE AND MAY VARY WITH STAGE CONSTRUCTION.
7. IF A PORTION OF AREA 'A' MUST BE DISTURBED TO FACILITATE CONSTRUCTION, EXCAVATE THE AREA THAT WILL BE DISTRUBED TO A DEPTH OF 1' AND STOCKPILE THE EXCAVATED MATERIAL. AFTER CONSTRUCTION RETURN THE STOCKPILED MATERIAL TO ITS ORIGINAL LOCATION AND ELEVATION IN THE CREEK.
8. Cofferdams must be at least 1 foot above the highest observed tide in the past 5 years.



SECTION A-A



LEGEND

ESA LIMIT

CREEK LIMIT LINE

WATER QUALITY BACKGROUND SAMPLING LOCATION

WATER QUALITY CONTROL SAMPLING LOCATION

CONSTRUCTION DETAILS
TEMPORARY CREEK DIVERSION SYSTEM
NO SCALE

C-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN
Caltrans

FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY		REVISED BY	
KAMRAN NAKHJIRI	JENNIFER CHEN		JC	
	CHECKED BY	NORMAN GONSALVES	DATE REVISED	3/28/13

LAST REVISION 03-29-13 | DATE PLOTTED => 01-NOV-2013 | TIME PLOTTED => 11:03

BORDER LAST REVISED 7/2/2010 | USERNAME => s109858 DGN FILE => 0400000678ga001.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0722 | PROJECT NUMBER & PHASE 04000006781

STORM WATER SAMPLING

NOTES:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. RHMA-G SHALL BE PLACED BEFORE PLACING FINAL PAVEMENT DELINEATION.

Storm Water Sampling Locations ●

LEGEND

- TEMPORARY CONSTRUCTION EASEMENT
- ROADWAY EXCAVATION
- ESA
- (No.) CURVE DATA NUMBER
- [No.] STRUCTURE SECTION NUMBER

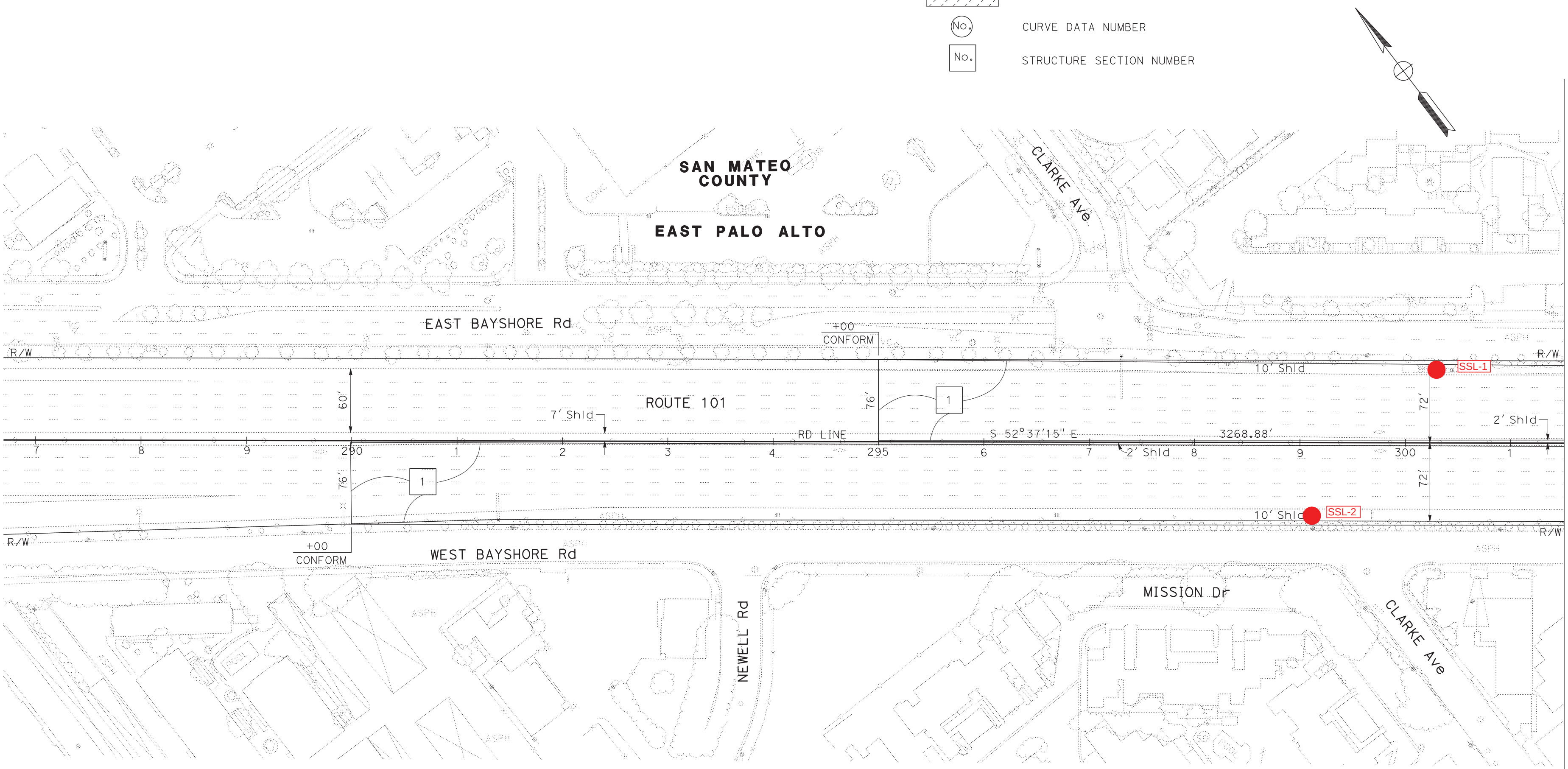
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCl,SM	101	52.0/52.6, 0.0/0.6	6	182

3/28/13
REGISTERED CIVIL ENGINEER DATE

10-28-13
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER G.B. Modesto No. 50338 Exp. 6-30-15 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.



LAYOUT

SCALE: 1" = 50'

L-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans®
DESIGN

FUNCTIONAL SUPERVISOR: DUAT NGUYEN
CALCULATED-DESIGNED BY: GERSY MODESTO
CHECKED BY: STUART GOODSON
REVISED BY: SG
DATE REVISED: 3/28/13

LAST REVISION 03-22-13
DATE PLOTTED => 01-NOV-2013
TIME PLOTTED => 11:03

BORDER LAST REVISED 7/2/2010

USERNAME => s109858
DGN FILE => 0400000678ea001.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0722

PROJECT NUMBER & PHASE 04000006781

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCl,SM	101	52.0/52.6, 0.0/0.6	7	182

REGISTERED CIVIL ENGINEER 3/28/13 DATE

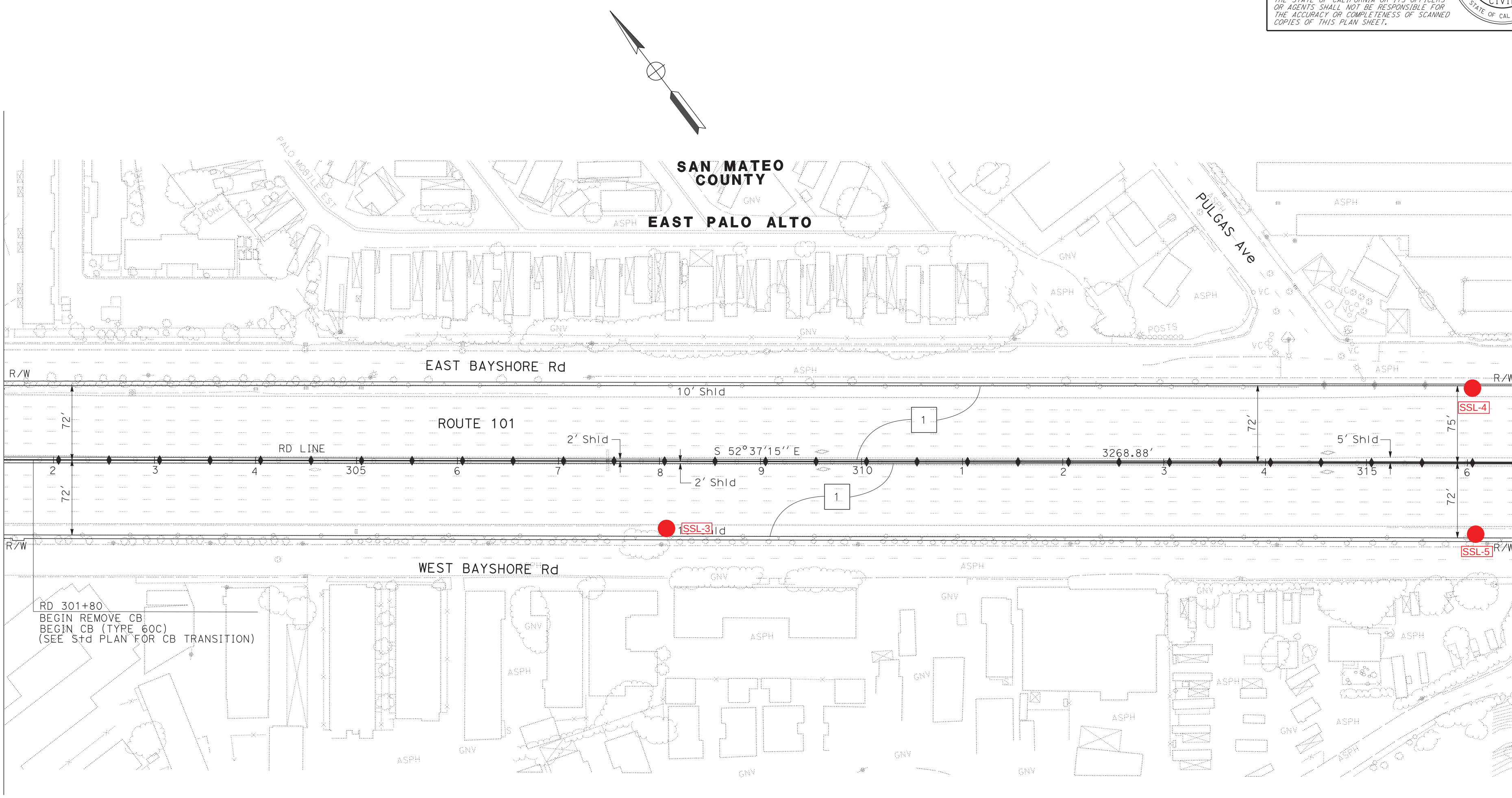
10-28-13
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER G.B. Modesto No. 50338 Exp. 6-30-15 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.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



LAYOUT

SCALE: 1" = 50'

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

L-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans DESIGN

FUNCTIONAL SUPERVISOR: DUAT NGUYEN

CALCULATED-DESIGNED BY: GERSY MODESTO

CHECKED BY: STUART GOODSON

REVISED BY: SG

DATE REVISED: 3/28/13

LAST REVISION 03-22-13

DATE PLOTTED => 01-NOV-2013
TIME PLOTTED => 11:03

BORDER LAST REVISED 7/2/2010

USERNAME => s109858
DGN FILE => 0400000678ea002.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0722

PROJECT NUMBER & PHASE 04000006781

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

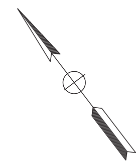
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCl,SM	101	52.0/52.6, 0.0/0.6	8	182

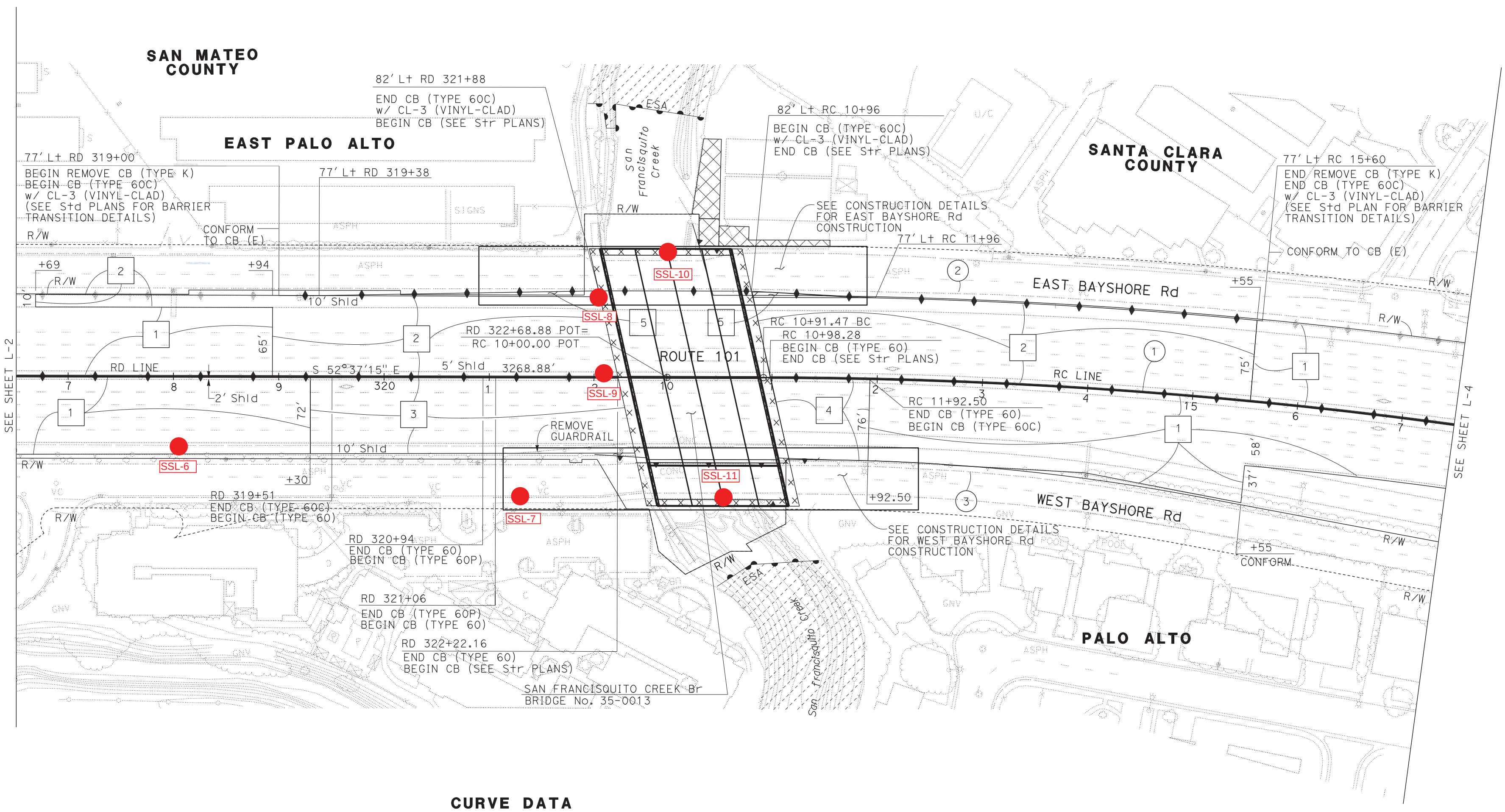
REGISTERED CIVIL ENGINEER 3/28/13 DATE

10-28-13
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER
G.B. Modesto
No. 50338
Exp. 6-30-15
CIVIL
STATE OF CALIFORNIA





CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
1	4984'	13°41'45"	598.53'	1191.36'	1987432.90	6086213.90
2	5000'	07°10'05"	313.17'	625.53'	1987483.42	6086259.78
3	2000'	10°30'32"	183.93'	366.83'	1989711.54	6088008.28

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT

SCALE: 1" = 50'

L-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
FUNCTIONAL SUPERVISOR DUAT NGUYEN
CALCULATED-DESIGNED BY GERSY MODESTO
CHECKED BY STUART GOODSON
REVISED BY SG
DATE REVISED 3/28/13

LAST REVISION 03-22-13
DATE PLOTTED => 01-NOV-2013
TIME PLOTTED => 11:03

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

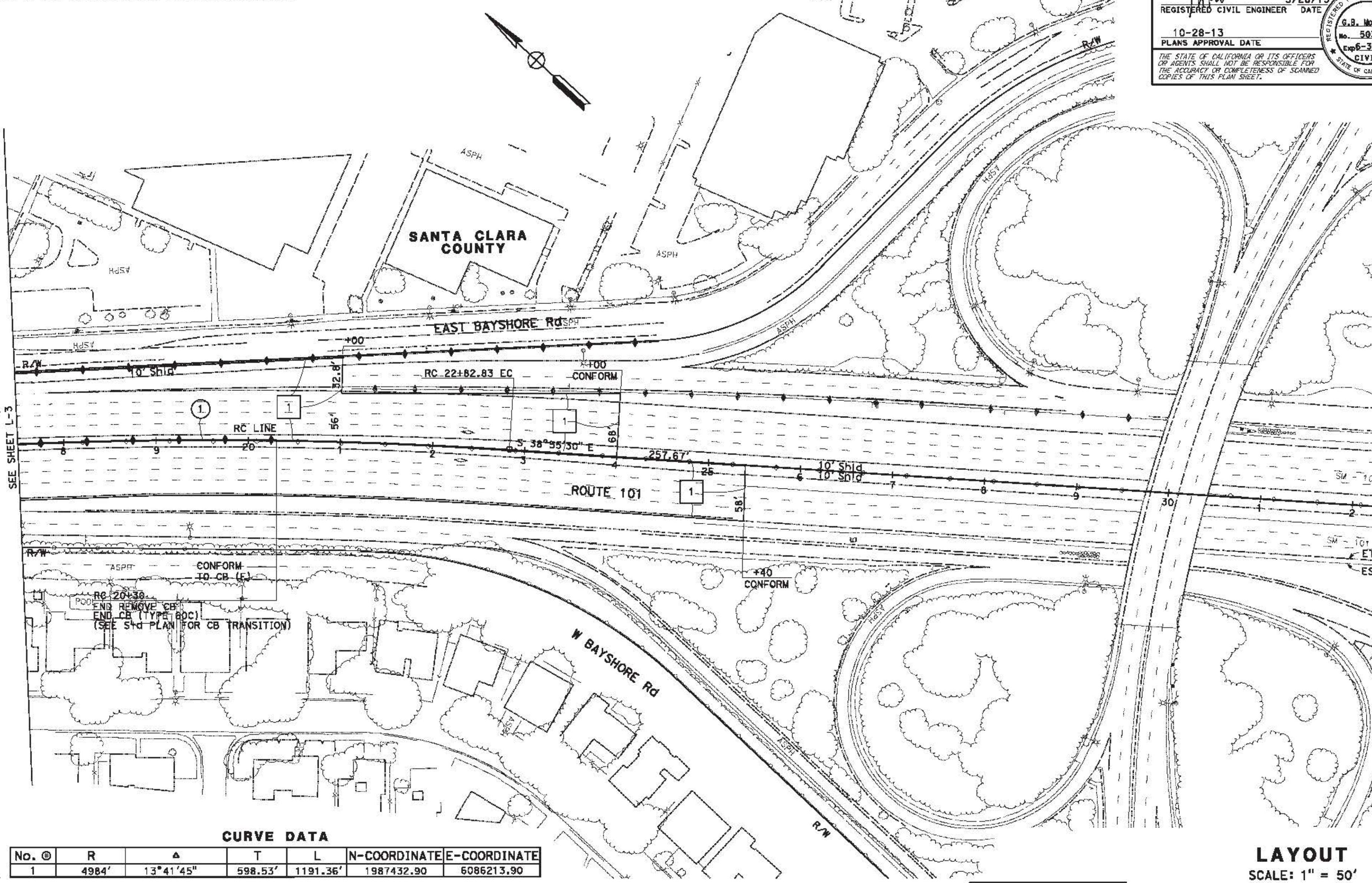
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCl,SM	101	52.0/52.6, 0.0/0.6	9	182

REGISTERED CIVIL ENGINEER 3/28/13 DATE

10-28-13
PLANS APPROVAL DATE

G.B. Modesto
No. 50338
Exp 6-30-15
CIVIL
REGISTERED PROFESSIONAL ENGINEER
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.



CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
1	4984'	13°41'45"	598.53'	1191.36'	1987432.90	6086213.90

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1" = 50'

L-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: DUAT NGUYEN
CALCULATED-DESIGNED BY: GERSY MODESTO
CHECKED BY: STUART GOODSON
REVISED BY: SG
DATE REVISED: 3/28/13

LAST REVISION 03-22-13
DATE PLOTTED => 01-NOV-2013
TIME PLOTTED => 11:03

BORDER LAST REVISED 7/2/2010
USERNAME => s109858
DGN FILE => 0400000678ea004.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0722
PROJECT NUMBER & PHASE 04000006781

Information on Creek Summer Flow

Hydraulic Information

The maximum base flow of 30 cfs is used to size the temporary creek diversion pipe. The flow was based on the 5 year historic daily discharge records (USGS Water Resources) between months of June 1 to October 15 when in-water works are allowed to perform.

The highest daily discharge for the last 5 years is 139 cfs which happened on Oct 13 2009, and it is also the second highest daily discharge for the last 50 years. The second highest daily discharge for the last 5 years is 22 cfs which happened on Oct 14, 2009. The base flow of 30 cfs was used.

A 30-inch plastic pipe (smooth interior) with pipe slope S=0.005 is sufficient to handle this flow. The highest daily discharge of 139 cfs for the last 50 years could be handled by the proposed 30-inch plastic pipe under inlet control with pressure flow 75 cfs at 9-foot headwater with storge capacity of the existing channel.

Fish Passage

The fishes concerned in the project area include steelhead, green sturgeon, and salmonids. As a discussion of the fish passage with the Biologist, we were advised that fish passage will need to be considered during a storm event to allow juvenile salmonids trapped in upstream pools to travel through the project area to downstream. The size of the diversion pipe has to be at least two times of the length of a juvenile salmonid which is about 5 inches. With minimum 30 inch diversion pipe, it is sufficient to provide the passage to the juvenile salmonids.

Email correspondence with the Hydraulics Engineer

From:	Dixon Lau
To:	Jiangfan Chen; Stuart Goodson
cc:	Norman Gonsalves; Joseph Peterson; PoTin Leung; Duat Dinh Nguyen
Subject:	Re: 235621_San Francisquito Creek Bridge Replacement Project -Diversion NSSP and Plan
Date:	02/20/2013 09:46 AM
Attachments:	04-235621_13-12 Temp Creek Diversion_2-5-13.doc Temporary Diversion Plan_2-5-13.pdf Temporary Diversion Plan_2-5-13.dgn

Good Morning Jiangfan & Stuart,

District Hydarulics performed another study/analysis on 50 years (ie from Feb 1962 to Feb 2013) historic daily discharge records generated by USGS Water Resources. Based on the construction windows between the months of June 1 to October 15, only one outstanding/max daily discharge of 569 cfs happened in 1962 Oct 13. And the second highest daily discharge of 139 cfs happened in 2009 Oct 13 which could be handled by our proposed 30-inch temporary diversion drainage system with storage capacity of the existing channel.

The probability for the most outstanding event = 1/50x360 x 100% =0.006 %.

In conclusion the effect of the daily discharge on drainage of San Francisquito Creek was considered and very unlikely the significant adverse drainage condition is expected.

If you have any questions regarding this study please reach me @ 510-1286-4854.

Best Regards,
Dixon Lau
Hydraulics

▼ Jiangfan Chen/D04/Caltrans/CAGov

Last 5 Year Flow Data

```
# ----------------------------------- WARNING ----------------------------------------
# The data you have obtained from this automated U.S. Geological Survey database
# have not received Director's approval and as such are provisional and subject to
# revision.  The data are released on the condition that neither the USGS nor the
# United States Government may be held liable for any damages resulting from its use.
# Additional info: http://waterdata.usgs.gov/nwis/help/?provisional
#
# File-format description:  http://waterdata.usgs.gov/nwis/?tab_delimited_format_info
# Automated-retrieval info: http://waterdata.usgs.gov/nwis/?automated_retrieval_info
#
# Contact:   gs-w_support_nwisweb@usgs.gov
# retrieved: 2013-05-29 19:19:47 EDT       (vaww01)
#
# Data for the following 1 site(s) are contained in this file
#    USGS 11164500 SAN FRANCISQUITO C A STANFORD UNIVERSITY CA
# -----------------------------------------------------------------------------------
#
# Data provided for site 11164500
#    DD parameter statistic   Description
#    01   00060     00003     Discharge, cubic feet per second (Mean)
#
# Data-value qualification codes included in this output:
#     A  Approved for publication -- Processing and review completed.
#     P  Provisional data subject to revision.
#
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USGS	11164500	2013-02-16	5.1	P
USGS	11164500	2013-02-17	5.5	P
USGS	11164500	2013-02-18	5.4	P
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USGS	11164500	2013-02-20	10	P
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USGS	11164500	2013-02-22	6.3	P
USGS	11164500	2013-02-23	5.6	P
USGS	11164500	2013-02-24	5.4	P
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USGS	11164500	2013-02-27	5.0	P
USGS	11164500	2013-02-28	4.6	P
USGS	11164500	2013-03-01	4.4	P
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USGS	11164500	2013-03-03	4.4	P
USGS	11164500	2013-03-04	5.0	P

USGS	11164500	2013-03-05	4.5	P
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USGS	11164500	2013-03-11	4.9	P
USGS	11164500	2013-03-12	4.5	P
USGS	11164500	2013-03-13	4.4	P
USGS	11164500	2013-03-14	4.4	P
USGS	11164500	2013-03-15	4.7	P
USGS	11164500	2013-03-16	4.8	P
USGS	11164500	2013-03-17	4.7	P
USGS	11164500	2013-03-18	4.9	P
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USGS	11164500	2013-03-22	4.7	P
USGS	11164500	2013-03-23	4.3	P
USGS	11164500	2013-03-24	4.1	P
USGS	11164500	2013-03-25	4.0	P
USGS	11164500	2013-03-26	4.1	P
USGS	11164500	2013-03-27	4.0	P
USGS	11164500	2013-03-28	4.2	P
USGS	11164500	2013-03-29	4.5	P
USGS	11164500	2013-03-30	4.0	P
USGS	11164500	2013-03-31	4.5	P
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USGS	11164500	2013-04-03	4.2	P
USGS	11164500	2013-04-04	8.3	P
USGS	11164500	2013-04-05	7.3	P
USGS	11164500	2013-04-06	5.3	P
USGS	11164500	2013-04-07	4.7	P
USGS	11164500	2013-04-08	5.0	P
USGS	11164500	2013-04-09	4.4	P
USGS	11164500	2013-04-10	3.6	P
USGS	11164500	2013-04-11	3.2	P
USGS	11164500	2013-04-12	3.1	P
USGS	11164500	2013-04-13	3.0	P
USGS	11164500	2013-04-14	2.8	P
USGS	11164500	2013-04-15	2.6	P
USGS	11164500	2013-04-16	2.4	P
USGS	11164500	2013-04-17	2.2	P
USGS	11164500	2013-04-18	2.1	P
USGS	11164500	2013-04-19	2.0	P
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USGS	11164500	2013-04-21	1.8	P
USGS	11164500	2013-04-22	1.6	P
USGS	11164500	2013-04-23	1.5	P
USGS	11164500	2013-04-24	1.5	P
USGS	11164500	2013-04-25	1.6	P
USGS	11164500	2013-04-26	1.5	P
USGS	11164500	2013-04-27	1.4	P
USGS	11164500	2013-04-28	1.4	P
USGS	11164500	2013-04-29	1.3	P
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USGS	11164500	2013-05-15	0.75	P
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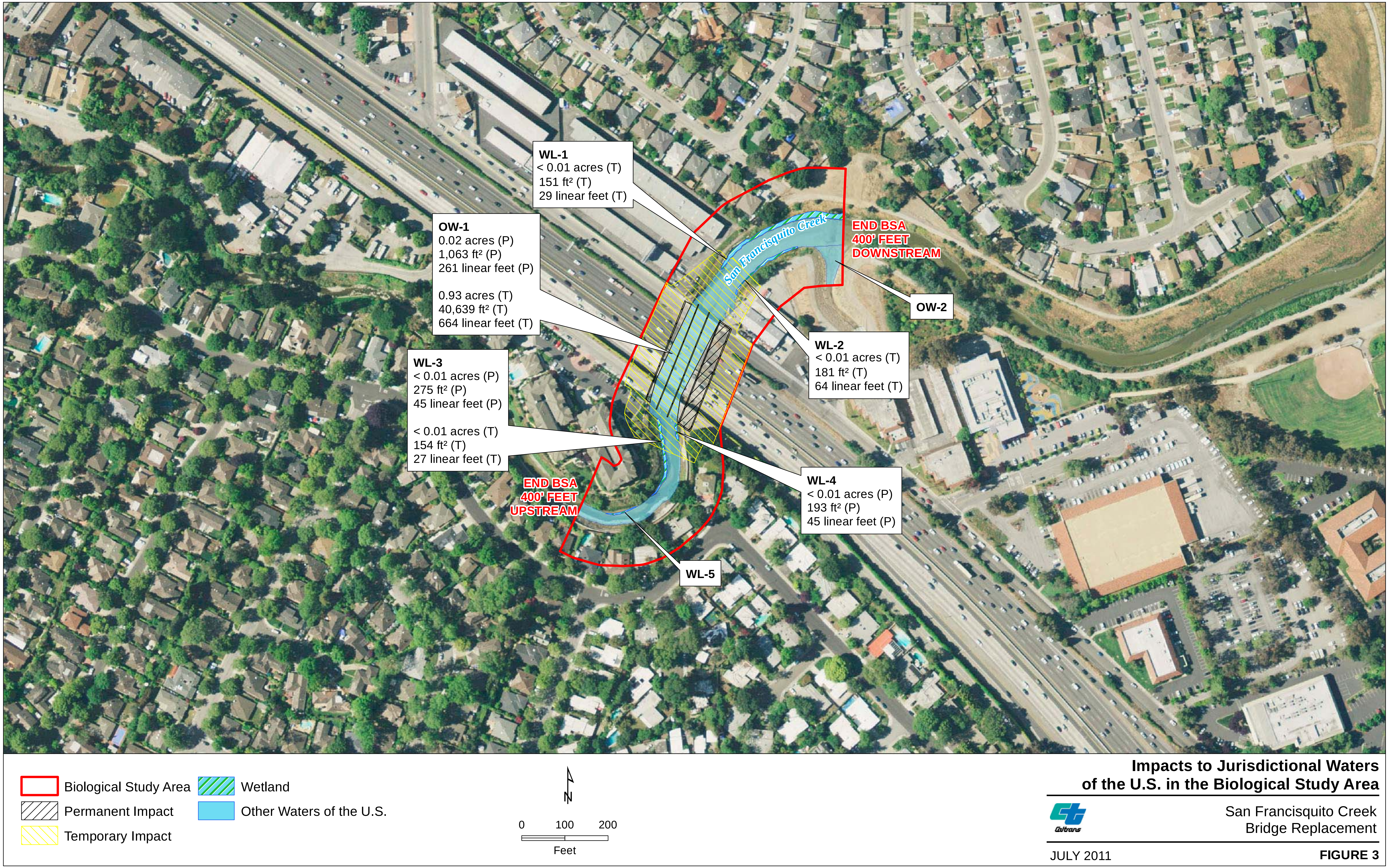
USGS	11164500	2013-05-24	0.55	P
USGS	11164500	2013-05-25	0.53	P
USGS	11164500	2013-05-26	0.53	P
USGS	11164500	2013-05-27	0.53	P
USGS	11164500	2013-05-28	0.56	P

401 Impact Map



Impacts to Jurisdictional Waters of the U.S. in the Biological Study Area

San Francisquito Creek
Bridge Replacement

JULY 2011

FIGURE 3

Permits

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

STREAMBED ALTERATION AGREEMENT
NOTIFICATION NO. 1600-2011-0270-R3
San Francisquito Creek

CALIFORNIA DEPARTMENT OF TRANSPORTATION
SAN FRANCISQUITO CREEK BRIDGE REPLACEMENT PROJECT

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

RECITALS

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

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

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

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

PROJECT LOCATION

The project is located where Interstate 101 crosses the San Francisquito Creek, on the border of San Mateo and Santa Clara Counties, in the State of California;

PROJECT DESCRIPTION

Caltrans proposes to demolish the existing San Francisquito Creek Bridge and the two frontage road bridges and replace them with a new bridge (Project). The Project proposes to replace the existing 83-foot long by 232-foot wide San Francisquito Creek Bridge and two associated two-lane frontage roads. The new bridge structure will have 12 feet in additional width and 42 feet in additional length to accommodate the standard lane requirements of Route 101 and the anticipated flow capacity of San Francisquito Creek. The proposed bridge will be 125 feet long and 244 feet wide and will carry five lanes of traffic on Route 101 in each direction. San Francisquito Creek is a tidally influenced creek that discharges water into the southern end of the San Francisco Bay. There has been a lengthy history of flooding along the banks of the creek due to limited capacity. Sediment deposition along the channel has clogged the waterway directly underneath and adjacent to the bridge. During extreme storm events, water has overtopped the bridge. The San Francisquito Creek Joint Powers Authority (SFCJPA) has proposed improvements to the creek to improve flow capacity upstream and downstream from Route 101. Caltrans, in cooperation with the SFCJPA effort, proposes to improve the hydraulic capacity of the bridge structure to accommodate a 100-year creek flow event combined with a high-tide event. It is proposed that the creek be widened and the new bridge lengthened to the southeast towards Palo Alto and Santa Clara County. The increased bridge length will require the construction of three pier walls to replace the two existing pier walls. The frontage road bridges will sit on the same pier walls as the new San Francisquito Creek Bridge. One of the four bridge cells will remain closed off with soldier piles walls on both sides until the downstream and upstream channels are widened to match the wider dimensions of the new bridge. These improvements will be completed by the SFCJPA under a separate project. The downstream SFCJPA project may be constructed concurrently or prior to the proposed Project. Once the SFCJPA flood protection projects are completed, all of the soldier pile walls will be removed, and the fourth cell will become fully operational.

A temporary soldier pile wall 25 feet long will be constructed downstream of the San Francisquito Creek Bridge adjacent to the Yeaman's Auto Body Shop parcel. The wall will be constructed on what is currently the south bank of the creek. The creek bank will then be excavated to the face of the retaining wall which ties into the third pier wall south of the new bridge. Riprap will be placed and removed post construction by the SFCJPA when the creek expansion project opens the fourth cell of the San Francisquito Creek Bridge.

Two cofferdams will be constructed upstream and downstream of the work area. The cofferdams will be constructed with sheet metal or another appropriate material and will be approximately 6 feet high. The creek will be diverted through a 30-inch diameter corrugated steel pipe that spans 460 feet between the two cofferdams. During flow events the pipe will allow flow downstream through the construction site.

An excavator will be used to excavate soil for abutments, site preparation for pile installation, and to widen the channel. Timber pads will be laid down in the dewatered work area to support construction equipment. Approximately 200 pipe piles will be permanently installed. The piles will be approximately 80-90 feet long and 16 inches in diameter. The piles will be installed by pre-drilling 40 feet though the sand layer and then the piles will be driven into the mud layer. A pile driver will be used to drive 6 to 8 piles per day. Pile driving is estimated to take 30 work days and will occur 8 hours per day during the dry season. Falsework will be constructed and the pile cap, pier walls and bridge deck will be poured using a concrete pump truck and cement mixer. The existing bridge will be removed using mounted hydraulic jack hammer, excavator and dump trucks

The creek will be accessed via the south bank upstream and downstream of the bridge. All temporary items in the creek, including falsework, cofferdams, and the water diversion pipe will be removed at the end of each construction season. The contours of the creek will be restored, access ramps backfilled, and erosion control measures implemented to prevent erosion.

Project Schedule
The Bridge construction is expected to begin June 1, 2014, and be completed by October 15, 2016.

PROJECT IMPACTS

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

- Riparian habitat
- Central California Coastal Steelhead habitat
- North American green sturgeon habitat
- Aquatic invertebrates
- Bird nesting
- Western pond turtles and habitat
- Emergent wetland
- Bat Roosting

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

- Tree removal
- Temporary loss of natural bed and bank
- Temporary loss of riparian habitat
- Temporary degradation of salmonid and sturgeon habitat
- Water quality degradation
- Short-term release of contaminants
- Disruption of bat roosting

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures
Permittee shall meet each administrative requirement described below.

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

1.2 Providing Agreement to Persons at Project Site. This Agreement and any extensions or amendments shall be onsite at all times during Project activities.

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

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

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below. These conditions apply to CDFW 1602 jurisdiction:

2.1 To minimize adverse impacts to fish and wildlife all work within the bed, bank, channel, and associated riparian habitat shall be confined to the period of June 1 to October 15. Revegetation work is not confined to this time period.

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

2.3 Prior to work commencing at the bridge site, the bridge shall be surveyed for bats by a Qualified Biologist. If bats are found bats shall not be disturbed without specific notice to and consultation with the CDFW. CDFW reserves the right provide additional provisions to this Agreement designed to protect bats.

2.4 Within 48 hours prior to construction, a Qualified Biologist shall conduct a wildlife survey, at the appropriate time of day, focusing on presence of Western pond turtle (*Clemmys marmorata*). If any Western pond turtles are found, a Qualified Biologist shall relocate the animal upstream of the project site in appropriate habitat.

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

2.6 The site shall be dewatered as necessary to provide an adequately dry work area. Corrugated metal pipes shall not be used for the water diversion. Pumps and siphons shall have double screens and mesh measuring 3/32 inches.

2.7 The Resident Engineer, or a designated representative, and a Qualified Biologist shall be onsite during dewatering and aquatic species relocation activities. All live steelhead and green sturgeon shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, and aerated water that is protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish shall not be removed from this water except when released. If necessary, a Qualified Biologist shall have at least two containers and segregate young-of-year salmonids from older salmonids and other potential aquatic predators in order to avoid predation effects. Captured steelhead and green sturgeon shall be relocated as soon as possible and will be given highest priority over other non-listed fish species. Water from the local collection site shall be used in live wells or other holding facilities during loading and transport. At no time shall chlorinated tap water be used. Water temperatures within any live well or other holding facility shall be kept at or below water temperature at the collection site. No non-native animals captured shall be returned to the stream or released alive. Both juvenile steelhead and green sturgeon shall be released downstream of the project area. Only a

Qualified Biologist with appropriate state and/or federal handling permits are permitted to handle state and/or federally listed species.

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

2.9 The perimeter of the work site shall be adequately fenced using high visibility Environmentally Sensitive Area (ESA) fencing to prevent damage to adjacent riparian habitat. No construction activities, within the riparian zone, will be allowed within the habitat protected by the ESA fencing (this does not preclude activities from occurring on the bridge or deck work above the ESA area).

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

2.11 Permittee shall salvage, stockpile, replace, and contour all wetland soils to the maximum extent practicable.

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

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

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

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

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

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

2.18 Permittee shall plan appropriately to ensure all work within DFG jurisdiction be completed by October 15 of each year.

3. Compensatory Measures

3.1 Oak tree removal shall be mitigated at a 5:1 removal to replacement ratio at the Pacheco Creek Mitigation Area in Santa Clara County. Replacement trees shall consist of 5-gallon saplings and shall be native species adapted to the lighting, soil and hydrological conditions at the replanting site. To ensure 80% survivorship at the end of 5 years, monitoring shall be conducted annually for a period of five years. If during the annual monitoring the plantings are not projected to meet 80% survivorship, Permittee is responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practices necessary to achieve 80% survivorship.

CONTACT INFORMATION

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

<u>To Permittee:</u>

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

<u>To DFG</u>:

Department of Fish and Game
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
Attn: Lake and Streambed Alteration Program – Melissa Escaron
Notification #1600-2011-0270-R3
mescaron@dfg.ca.gov

LIABILITY

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

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

SUSPENSION AND REVOCATION

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

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

ENFORCEMENT

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

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

OTHER LEGAL OBLIGATIONS

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

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

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

AMENDMENT

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

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

TRANSFER AND ASSIGNMENT

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

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

EXTENSIONS

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

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

EFFECTIVE DATE

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

TERM

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

AUTHORITY

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

AUTHORIZATION

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

CONCURRENCE

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

FOR CALIFORNIA DEPARTMENT OF TRANSPORTATION

Jeffrey G. Jensen	Date
Office Chief Biological Sciences and Permits	

FOR DEPARTMENT OF FISH AND GAME

Scott Wilson	Date
Acting Regional Manger	

June 12, 2013
CIWQS Place No. 793406

Sent via electronic mail--no hard copy to follow

California Department of Transportation
Attn: Ron Moriguchi
Ron_Moriguchi@dot.ca.gov
111 Grand Ave.
Oakland, CA 94612-3717

Subject: Water Quality Certification for the U.S. 101 San Francisquito Creek Bridge Replacement Project, Cities of Palo Alto and East Palo Alto, Santa Clara and San Mateo County

Department Project No.: EA 04-23562

Dear Mr. Moriguchi:

We have reviewed and hereby issue water quality certification (Certification) to the California Department of Transportation (Department) for the U.S. 101 San Francisquito Creek Bridge Replacement Project (Project). The Department is seeking a Nationwide Permit 14 for Linear Transportation Projects from the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act (33 U.S.C. § 1344). As such, the Department has applied to the San Francisco Bay Regional Water Quality Control Board (Water Board) for a Clean Water Act Section 401 water quality certification that the Project will not violate State water quality standards.

Project: The following project description was derived from application materials received by the Water Board on February 19, 2013 and supplemental information provided by the Department via email on May 17, May 31, June 5, and June 6, 2013.

The Department proposes removal and replacement of the bridge that carries U.S. 101, East Bayshore Road, and West Bayshore Road over San Francisquito Creek (Creek). The existing bridge is structurally deteriorated and lacks hydraulic capacity, which contributes to flooding along the Creek. The replacement bridge will be wider than the existing bridge to provide standard lane and shoulder widths on U.S. 101, and longer than the existing bridge to accommodate a 100-year Creek flow event combined with a 100-year high tide event. The Project is planned in conjunction with projects by the San Francisquito Creek Joint Powers Authority (SFCJPA) to increase hydraulic capacity in the Creek downstream and upstream of U.S. 101. The Project is expected to take three years to complete and will be staged to minimize traffic impacts.

Project elements include:

- Temporary diversion of the Creek each year between June 1 and October 15. Creek diversion will be accomplished by constructing sheet pile cofferdams and a installing a 30” diversion pipe to allow water to pass through the work area.

- Installation of access ramps to allow equipment to access the Creek for construction of cofferdams and bridge demolition and construction.

- Demolition and removal of the existing bridge which consists of two pier walls and three spans.

- Installation of approximately 200 - 16 inch diameter pier piles.

- Installation of falsework and construction of a new bridge composed of three pier walls and four spans. Creek flow through the fourth span will be blocked on both sides by soldier pile walls until the downstream channel widening project by the SFCJPA is completed.

- Placement of rock slope protection along the channel bed at the base of the soldier pile wall. Rock slope protection will be removed as part of the SFCJPA project.

- Dewatering of stormwater and groundwater from the project site.

Impacts: Project implementation would permanently impact approximately 0.05 acre (286 linear feet) of San Francisquito Creek, and two coast live oak trees. Permanent impact to the Creek would result from construction of three concrete bents to support the bridge deck and additional shading caused by a larger bridge footprint. Permanent impact to oak trees would result from roadway and bridge abutment construction which would compromise the root structure of the trees.

Project implementation would temporarily impact approximately 0.02 acre of estuarine wetland, 0.93 acres (527 linear feet) of San Francisquito Creek and 0.092 acre of riparian vegetation. Temporary impacts will result from demolition and construction of the bridge and temporary diversion of the Creek.

See Attachment for impact locations and maps.

Roadway Pollutant Impacts: Project implementation would result in approximately 0.26 acres of new and 0.44 acres of reworked impervious area. Stormwater runoff from impervious areas may contain hydrocarbons, metals, volatile organic compounds, trash, and sediment at levels that may significantly impact waters of the State if left untreated.

Hydromodification Impacts: Added impervious areas may result in alterations to existing hydrologic regimes, resulting in erosion and/or changes of sediment transport in receiving waters (hydromodification). Because added impervious area for the project will result in a minimal increase in stormwater runoff, and the project area discharges to San Francisquito Creek, which is tidally influenced, hydromodification mitigation is not required for this Project.

Avoidance and Minimization: The Department has avoided and minimized impacts to San Francisquito Creek, wetlands, and riparian vegetation by: utilizing a closed bypass pipe to temporarily divert the Creek at the suggestion of the National Marine Fisheries Service; utilizing a timber mat and plywood (or equivalent) system to protect the Creek from demolition debris; using sediment and erosion control best management practices; and performing construction and demolition activities in the Creek between June 1 and October 15 when flows are minimal.

Mitigation: To mitigate for permanent impacts to riparian vegetation, the Department shall plant 10 oak trees at the Pacheco Creek Mitigation Area in Santa Clara County (see Certification Condition no. 2).

To mitigate for temporary impacts to San Francisquito Creek and estuarine wetlands, the Department shall remove all non-native materials used for bridge construction and temporary creek bypass, that are not part of the permanent bridge structure at the end of each construction season. The Creek shall be restored to original elevations and contours, except in the areas where it will be widened to increase hydraulic capacity. Widening of the Creek shall result in approximately 0.34 acres in increased Creek area within the project limits.

Roadway Pollutant Mitigation: As mitigation for increased pollutant loads associated with approximately 0.70 acre of added and reworked impervious area for this Project, the Department shall construct two biofiltration swales to treat stormwater runoff (see Certification Condition no. 1). The biofiltration swales shall be located in the northbound and southbound entrance loops from Embarcadero Road to U.S. 101 (see Attachment for location map and details). Bioswale 1, located in the southbound loop, shall be sized to treat approximately 0.498 acre of impervious area. Bioswale 2, located in the northbound loop, shall be sized to treat approximately 0.222 acre of impervious area.

CEQA Compliance: The Department evaluated the Project pursuant to the requirements of the California Environmental Quality Act (CEQA) in a Negative Declaration. The Department filed a Notice of Determination on March 19, 2012 that the Project would not have a significant effect on the environment (SCH No. 2011042065).

California Wetlands Portal: It has been determined through regional, state, and national studies that tracking of mitigation/restoration projects must be improved to better assess the performance of these projects. In addition, to effectively carry out the State's No Net Loss Policy for wetlands, the State needs to closely track wetland losses, gains, and mitigation/restoration project success. Therefore, we require the Department use the California Wetlands Standard Form to provide Project information related to impacts and mitigation/restoration measures (see Condition nos. 3 and 4 of this Certification). An electronic copy of the form and instructions may be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml

Project information concerning impacts and mitigation/restoration will be made available at the web link: http://www.californiawetlands.net

Certification: I hereby issue an order certifying that any discharge from the referenced Project will comply with the applicable provisions of sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, and with other applicable requirements of State law. This discharge is also regulated under State Water Resources Control Board Order No. 2003 - 0017 – DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification" which requires compliance with all conditions of this Certification. The following conditions are associated with this Certification:

1. As mitigation for increased pollutant loads associated with impervious surface added and reworked with the Project, the Department shall provide treatment of stormwater runoff from no less than 0.70 acre of impervious area using biofiltration swales. The biofiltration swales shall be installed concurrently with this Project and be consistent with the plans in the Attachment of this Certification. Any revisions to the biofiltration swale design details shall be subject to the acceptance of Water Board staff.

2. To compensate for the removal of two coast live oak trees, the Department shall:

    a. Plant no less than 10 oak trees at Pacheco Creek Mitigation Area in Santa Clara County, CA;

b. Only deem oak tree plantings successful after ten growing seasons, whereupon eighty percent of the planted oaks shall exhibit average or improved health and vigor from the previous two growing seasons;

c. Provide additional planting, maintenance and monitoring until the success criteria is satisfied if the above success criteria is not met;

d. Submit monitoring reports to the Water Board by January 1 for years 1, 2, 3, 5, 7, and 10. All monitoring reports shall include photo-documentation utilizing consistent photo vantage points. At the end of year 10, a comprehensive final report shall be prepared that includes summaries of the monitoring data, representative photos, and maps.

3. The Department is required to use the California Wetlands Standard Form to provide project information describing impacts and mitigation/restoration measures within 14 days from the date of this Certification. An electronic copy of the form can be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. The completed California Wetlands form shall be submitted electronically to habitatdata@waterboards.ca.gov or shall be submitted as a hard copy to both: 1) The Water Board, 1515 Clay St., Suite 1400, Oakland, CA 94612, to the attention of California Wetlands Portal; and 2) San Francisco Estuary Institute, 4911 Central Ave., Richmond, CA 94804, to the attention of California Wetlands Portal;

4. Mitigation and monitoring reports shall be submitted to the Water Board by January 1 of each year. Modification of this deadline is subject to the acceptance of Water Board staff. The reports may be submitted by upload to the California Wetlands Portal website at http://www.californiawetlands.net/tracker/ba/list. Select San Francisquito Bridge Replacement Project from the Bay Area Project List and then use the “Files & Links” web-link on the mitigation site project page to upload the report. The Department shall immediately notify appropriate Water Board staff once the monitoring report has been uploaded. If the Department cannot, or chooses not to submit the report using the California Wetlands Portal, the report may be submitted directly to Water Board staff electronically, via e-mail;

5. All temporarily disturbed areas above the ordinary high water mark shall be re-vegetated using only native plant species. The Department shall not cause, through operation of heavy machinery, or any other construction activity, compaction of marshes or open waters in areas of temporary impact. Any compaction of marshes or open waters in areas of temporary impact shall require mitigation;

6. The Resident Engineer (or appropriately authorized agent) shall hold onsite water quality permit compliance meetings (similar to tailgate safety meetings) to discuss permit compliance, including instructions on violation avoidance and violation reporting procedures. The meetings shall be held at least every other week, before forecasted storm events, and when a new contractor or subcontractor arrives to begin

work at the site. The contractors, subcontractors and their employees, as well as any inspectors or monitors assigned to the Project, shall be present at the meetings. The Department shall maintain dated sign-in sheets for attendees at these meetings, and shall make them available to the Water Board on request;

7. Concrete shall be excluded from surface water for a period of 30 days after it is poured/sprayed. During that time the concrete shall be kept moist and runoff from the concrete shall not be allowed to enter State waters. Commercial sealants may be applied to the concrete surface in instances where 30 days of water exclusion is infeasible. If sealant is used, water shall be excluded from the site until the sealant is cured. If groundwater comes into contact with fresh concrete, it shall be prevented from flowing towards surface water;

8. The Project shall be constructed in conformance with the Project Description described in this Certification and certification application materials. Any change in the Project that could impact State waters may require compensatory mitigation and shall first be reported to and found acceptable by the Water Board Executive Officer;

9. If, at any time, an unauthorized discharge to surface water (including wetlands, rivers or streams) occurs, or any other water quality problem arises, the associated Project activities shall immediately cease until adequate BMPs are implemented. The Water Board shall be notified promptly within 24 hours after the unauthorized discharge or water quality problem arises;

10. The Department shall adhere to the conditions imposed by Nationwide Permit 14 for Linear Transportation Projects issued to the Department by the U.S. Army Corps of Engineers, the Streambed Alteration Agreement issued to the Department by the California Department of Fish and Wildlife, and the Biological Opinion issued by the National Marine Fisheries Service;

11. All activities and best management practices (BMPs) shall be implemented according to the submitted application materials and the findings and conditions of this Certification. BMPs for erosion, sediment, turbidity and pollutant control shall be implemented and in place at commencement of, during, and after any ground clearing activities, construction activities, or any other Project activities that could result in erosion, sediment, or other pollutant discharges to waters of the State. The BMPs shall be implemented in accordance with the Caltrans Construction Site Best Management Practice Manual (CCSBMPM) and all contractors and subcontractors shall comply with the CCSBMPM. BMPs for erosion and sediment control shall be utilized throughout all phases of construction, regardless of date, wherever sediment-laden runoff threatens to enter waters of the State. The Department shall stage erosion and sediment control materials at the work site. All BMPs shall be installed properly and in accordance with the manufacturer's specifications. If the Project

Resident Engineer elects to install alternative BMPs for use on the project, the Department shall submit a proposal to Water Board staff for review and concurrence;

12. The Department shall not use or allow the use of erosion control products that contain synthetic materials within waters of the State at any time. The Department shall request approval from Water Board staff if an exception from this requirement is needed at a specific location. In upland and riparian areas, the Department shall prioritize the use of wildlife-friendly biodegradable (not photo-degradable) erosion control products. The Department shall not use or allow the use of erosion control products that contain synthetic netting for permanent erosion control (i.e. erosion control materials to be left in place for two years or after the completion date of the Project).

    If the Department finds that erosion control netting or products have entrapped or harmed wildlife, personnel shall remove the netting or product and replace it with wildlife-friendly biodegradable products;

13. Fueling, lubrication, maintenance, storage and staging of vehicles and equipment shall be prohibited within waters of the State. Fueling of individual equipment types within waters of the State may be authorized if the Department first prepares a fueling plan that:
    a. Identifies the specific piece of machinery that may require fueling within waters of the State;
    b. Provides justification for the need to refuel within State waters. The justification shall describe why fueling outside of jurisdictional waters is infeasible; and
    c. Includes a narrative of specific BMPs that shall be employed to prevent and capture fuel releases.

    Fueling of equipment within waters of the State shall be prohibited until the above mentioned plan has been approved by Water Board staff. The fueling plan may be submitted individually, included in the project Storm Water Pollution Prevention Plan (SWPPP), or submitted as a SWPPP amendment.

14. Fueling, lubrication, maintenance, storage and staging of vehicles and equipment shall not result in a discharge or a threatened discharge to any waters of the State. At no time shall the Department use any vehicle or equipment which leaks any substance that may impact water quality;

15. Except as expressly allowed in this Certification, the Department is prohibited from discharging waste to waters of the State. No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or concrete washings, welding slag, oil or petroleum products, or other organic or earthen material from any construction or

associated activity of whatever nature, other than that authorized by this Certification, shall be allowed to enter into waters of the State. Except for temporary stockpiling of waste generated during demolition operations ("temporary" in this instance means generated and removed during the same working day), waste materials shall not be placed where the materials may be washed by rainfall into waters of the State;

16. The Department shall provide analysis and verification that placement of non-hazardous waste or inert materials (which may include discarded product or recycled materials) will not result in degradation of water quality, human health, or the environment. All Project-generated waste shall be handled, transported, and disposed in strict compliance with all applicable State and Federal laws and regulations. When construction is complete, any excess material or debris shall be removed from the work area and disposed of properly and in accordance with the State and Federal laws and regulations, the Department is liable and responsible for the proper disposal of waste generated by their Project;

17. All imported fill material shall be clean and free of pollutants. All fill material shall be imported from a source that has the appropriate environmental clearances and permits. The reuse of low-level contaminated solids as fill onsite shall be performed in accordance with all State and Federal policies and established guidelines; a plan for such re-use must first be submitted to Water Board staff for review and concurrence;

18. Work in flowing or standing surface waters is prohibited;

19. Caltrans shall submit, subject to the acceptance of Water Board staff, a dewatering and/or diversion plan that appropriately describes the dewatered or diverted areas and how those areas will be handled during construction. The diversion/dewatering plans shall be submitted no later than 30 days prior to conducting the proposed activity. Diversion/dewatering activities shall be prohibited until Water Board staff has accepted the dewatering/diversion plan for that specific water. Information submitted shall include the area or work to be diverted or dewatered and method of the proposed activity. All diversion or dewatering activities shall be designed to minimize the impact to waters of the State, avoid fish entrainment, and maintain natural flows upstream and downstream. All dewatering or diversion structures shall be installed in a manner that does not cause sedimentation, siltation or erosion upstream or downstream. All dewatering or diversion structures shall be removed immediately upon completion of Project activities;

20. This Certification does not allow for the take, or incidental take, of any special status species. The Department shall use the appropriate protocols, as approved by the California Department of Fish and Wildlife and the USFWS, to ensure that Project activities do not impact the Beneficial Use of the Preservation of Rare and Endangered Species, as described in the San Francisco Bay Regional Water Quality Control Plan;

21. The Department shall maintain a copy of this Certification at the Project site to be available at all times to Project personnel. It is the responsibility of the Department to assure that all personnel (employees, contractors, and subcontractors) are adequately informed and trained regarding the conditions of this Certification;

22. The Water Board may add to or modify the conditions of this Certification, as appropriate, to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act;

23. This Certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section 13330 of the California Water Code and Title 23 of the California Code of Regulations, Section 3867;

24. This Certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license, unless the pertinent certification application was filed pursuant to California Code of Regulations Title 23, Subsection 3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought; and

25. This Certification is conditioned upon total payment of the full fee required in State regulations (23 CCR Section 3833). The Water Board has received the full fee for this Certification.

We anticipate your cooperation in implementing these conditions. However, please be advised that any violation of water quality certification conditions is a violation of State law and subject to administrative civil liability pursuant to California Water Code, Section 13350. Failure to respond, inadequate response, late response, or failure to meet any condition of this Certification may subject you to civil liability imposed by the Water Board to a maximum of $5,000 per day per violation or $10 for each gallon of waste discharged in violation of this Certification.

This Certification includes requirements for information and reports. Any requirement for a report made as a condition to this action is a formal requirement pursuant to CWC section 13267, and failure or refusal to provide, or falsification of such required report is subject to civil liability as described in California Water Code, Section 13268.

If you have any question, please contact Derek Beauduy at (510) 622-2348, or via e-mail to DBeauduy@waterboards.ca.gov.

Sincerely,

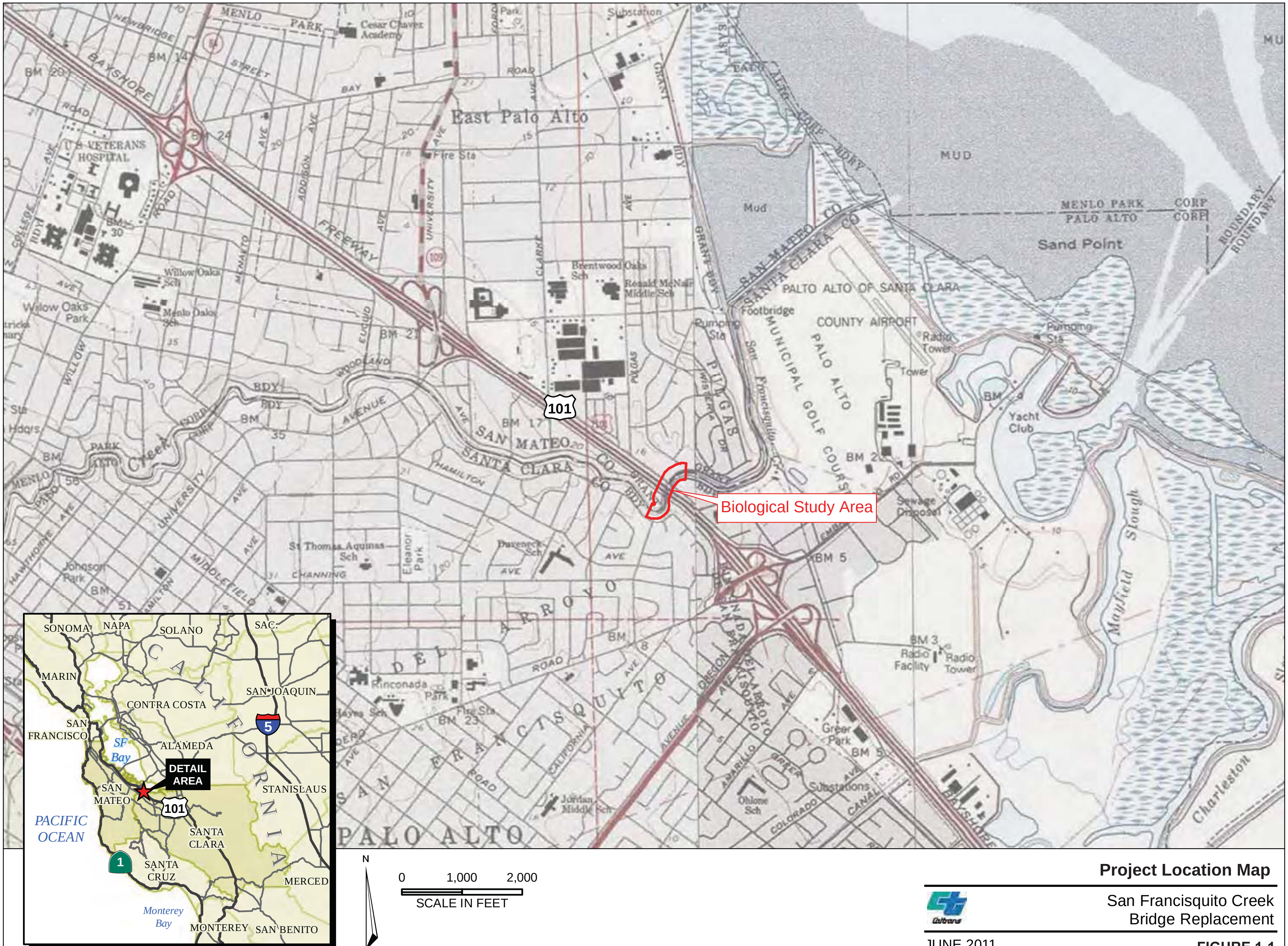
Bruce H. Wolfe
Executive Officer

Attachment

cc (via e-mail):
Mr. Bill Orme SWRCB-DWQ
Mr. Cameron Johnson, USACE
Ms. Jane Hicks, Regulatory Branch, USACE
Ms. Melissa Escaron, CDFW
Ms. Paula Gill, USACE
Mr. Ryan Olah, USFWS
Mr. Dale Bowyer, Water Board
Mr. Cyrus Vafai, Caltrans
Mr. Hardeep Takhar, Caltrans
Mr. Jason Brush, USEPA
Mr. Wilfung Martono, Caltrans

Attachment

Project Maps, Plans, and Details



Project Location Map

San Francisquito Creek
Bridge Replacement

JUNE 2011

FIGURE 1-1

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

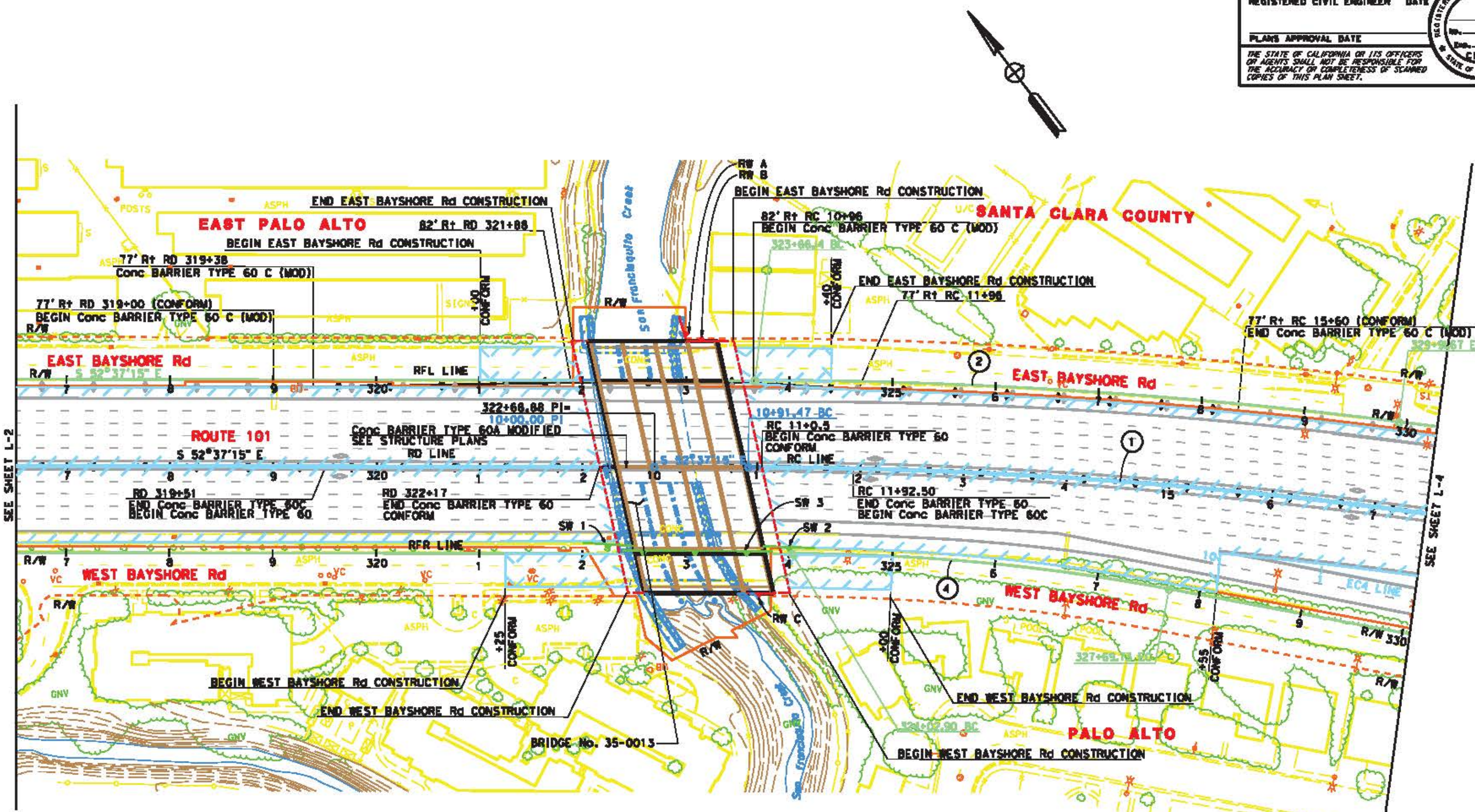
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA



CURVE DATA

No. ⊙	R	Δ	T	L	N	E
1	4984'	13°41'45"	598.53'	1191.36'	1987432.90	6086213.90
2	5000'	7°10'05"	313.17'	625.53'	1987483.42	6086259.78
3	260'	42°38'42"	101.49'	193.52'	1990715.85	6090474.13
4	2000'	10°30'32"	183.93'	366.83'	1989711.54	6089008.28
5	500'	42°43'40"	195.59'	372.87'	1990269.33	6089526.04

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

SAN FRANCISQUITO CREEK BRIDGE REPLACEMENT LAYOUT

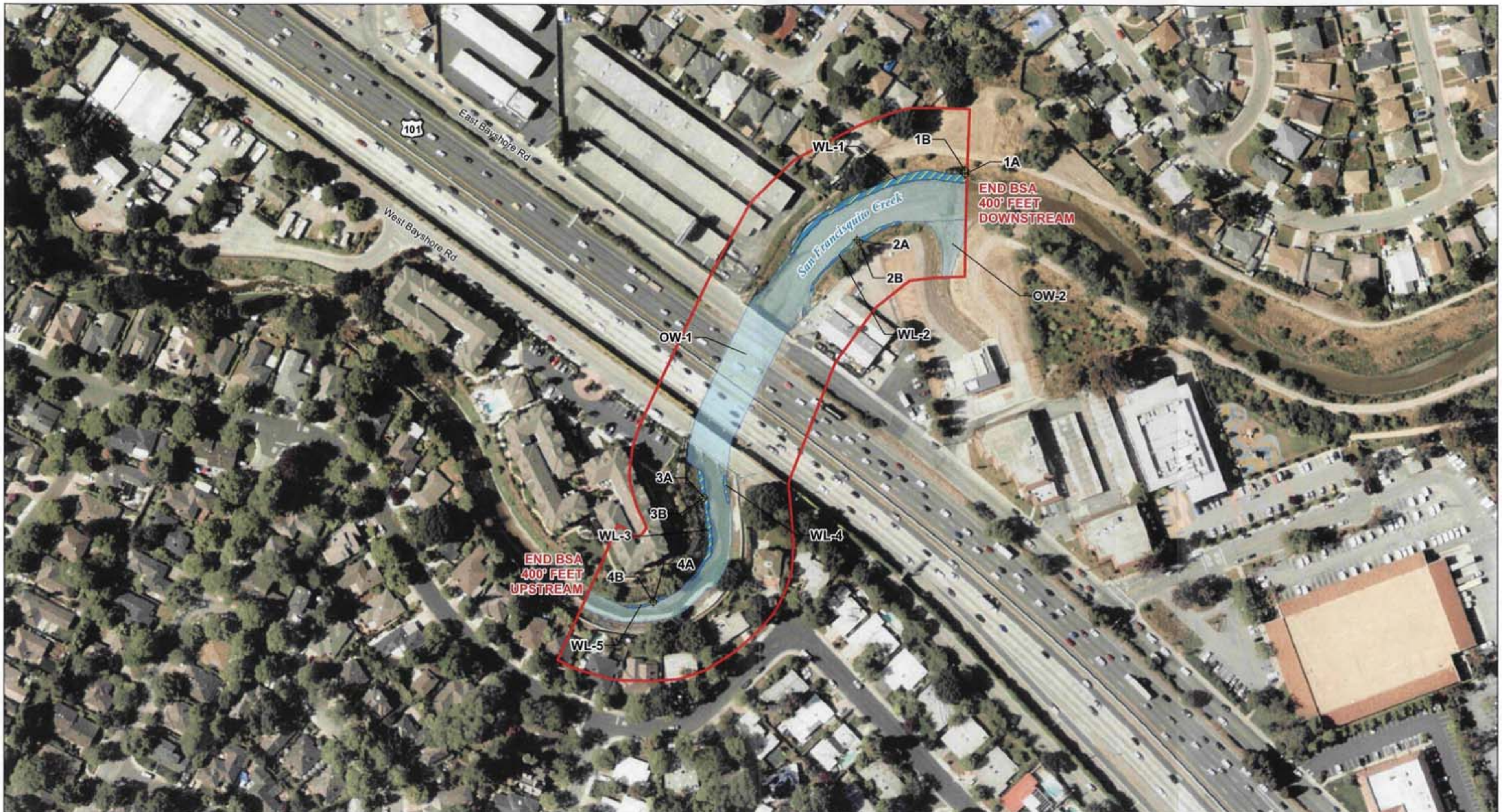
SCALE: 1" = 50'

L-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

LAST REVISION 00-00-00 | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME



Wetland Sampling Point

Wetland

Other Waters of the U.S.

Biological Study Area

N

0 100 200

Feet

U.S. Army Corps of Engineers
San Francisco District, Regulatory Division
Preliminary Jurisdictional Determination

California Department of Transportation, District 4
San Francisco Creek Bridge Replacement Project, Hwy 101
File no.: SPN-2011-00088 S Date: Mar. 23, 2011

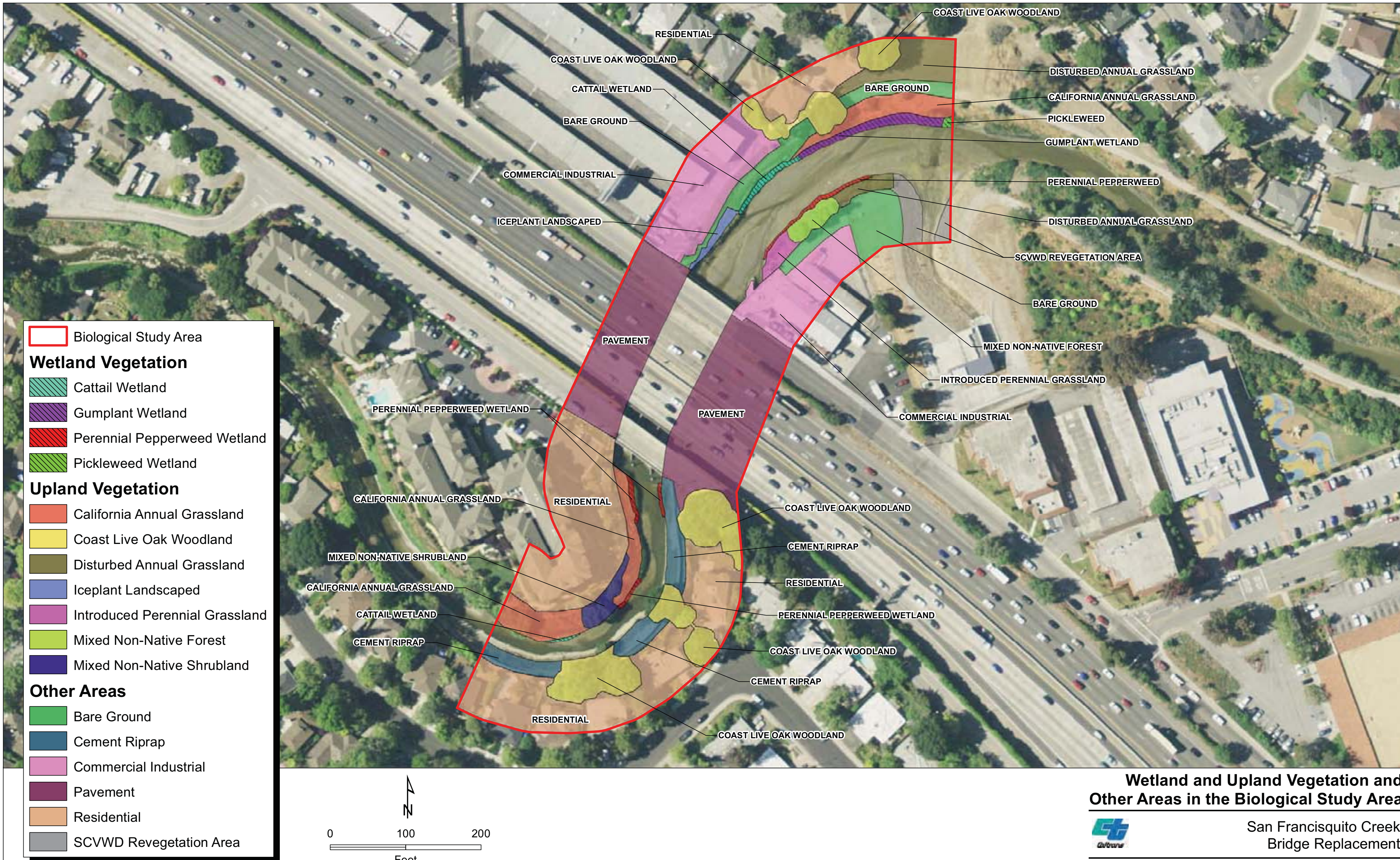
Potentially Jurisdictional Waters of the U.S. in the Biological Study Area

Caltrans

San Francisquito Creek Bridge Replacement

FEBRUARY 2011

FIGURE 2-2

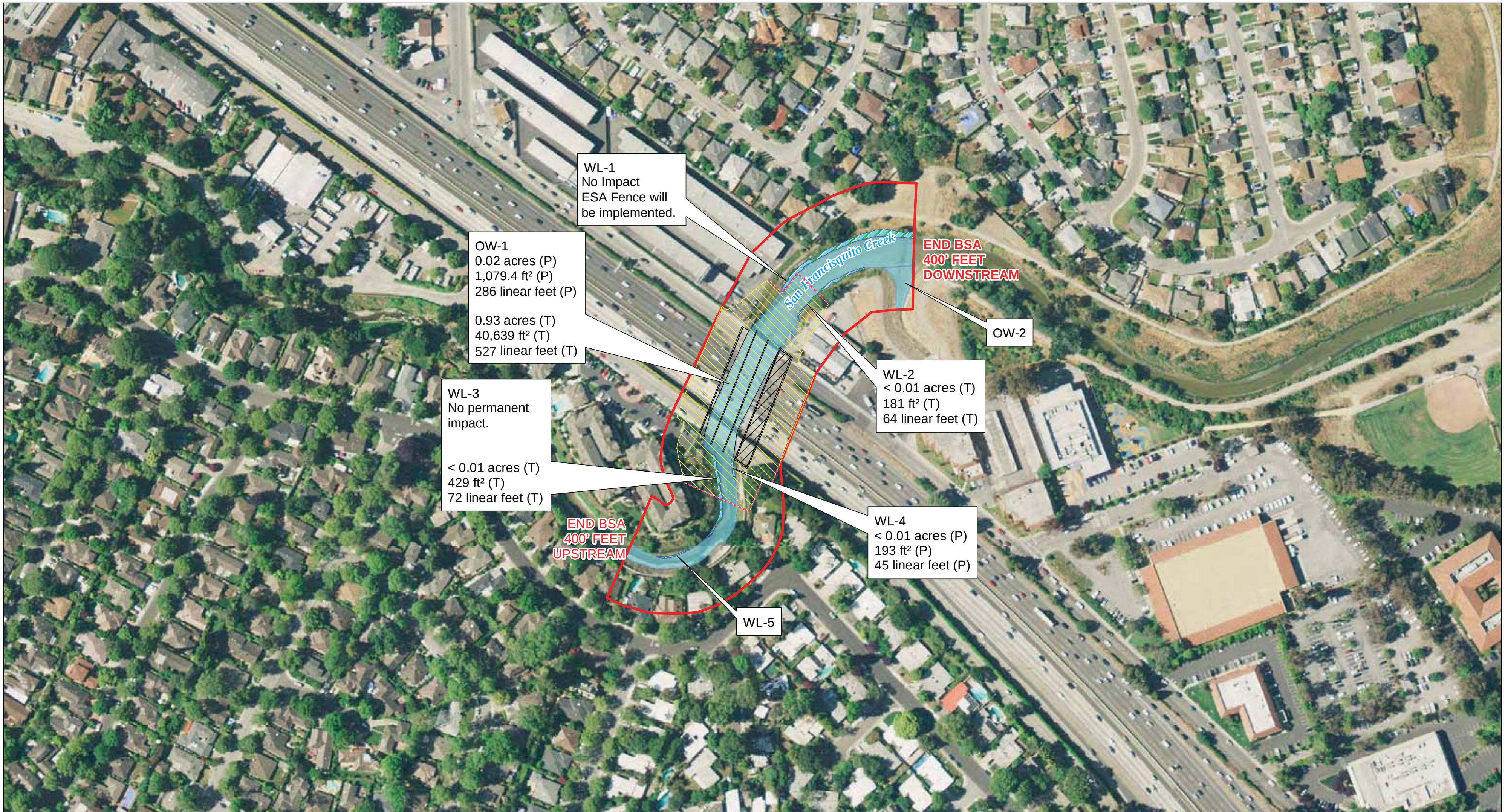


Wetland and Upland Vegetation and Other Areas in the Biological Study Area

San Francisquito Creek
Bridge Replacement

DECEMBER 2010

FIGURE 2-3



Biological Study Area
Permanent Impact
Temporary Impact
Wetland
Other Waters of the U.S.
ESA Fence

N

0 100 200
Feet

Total Impacts to Waters of the U.S.

	Permanent	Temporary
Wetlands:	0	0.02 acre (181 lf)
Other Waters:	0.02 acre (286 lf)	0.93 acre (527lf)

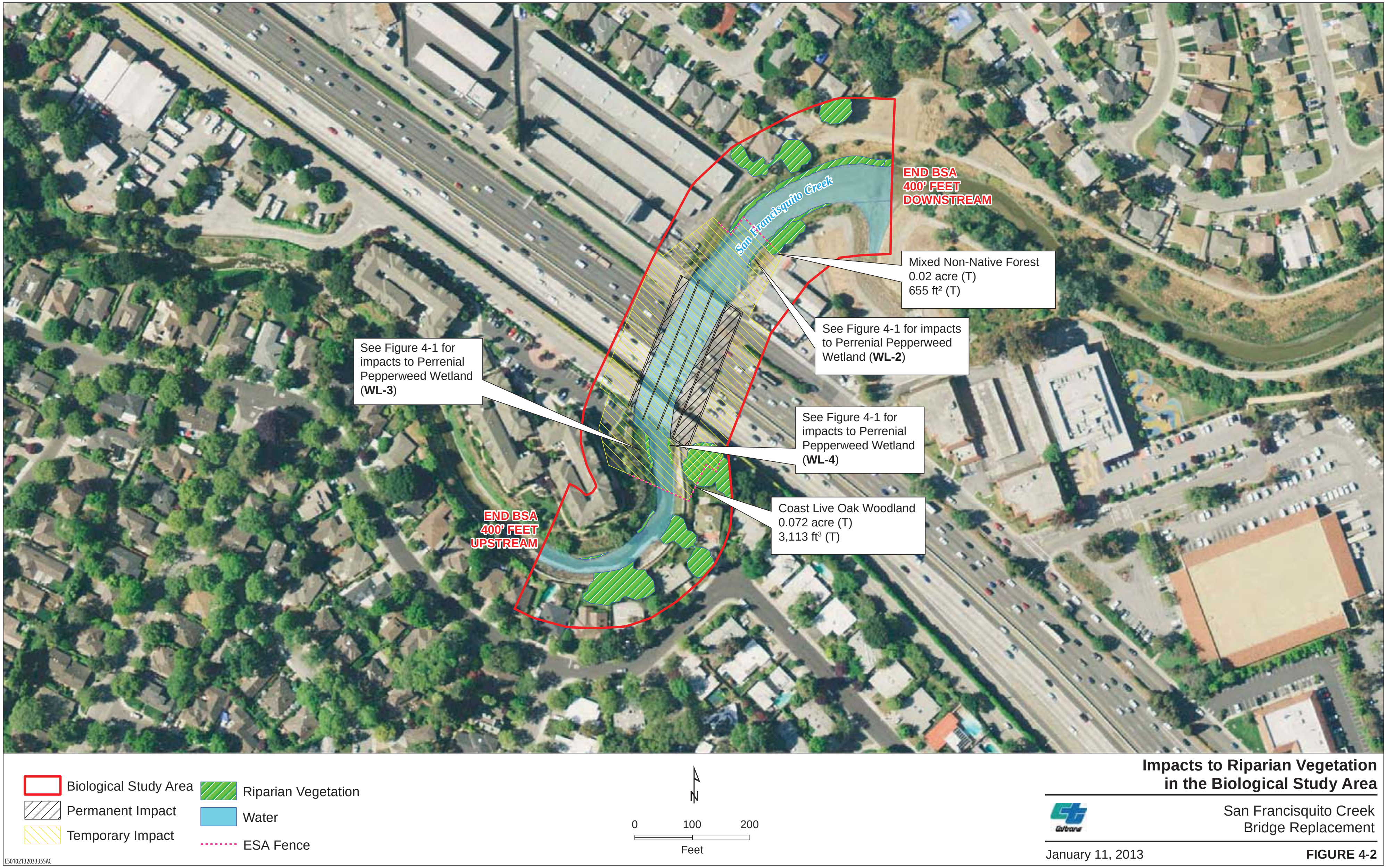
Impacts to Jurisdictional Waters of the U.S. in the Biological Study Area

San Francisquito Creek
Bridge Replacement

January 11, 2013

FIGURE 4-1

ES010213203335SAC



Impacts to Riparian Vegetation in the Biological Study Area

San Francisquito Creek
Bridge Replacement

January 11, 2013

FIGURE 4-2

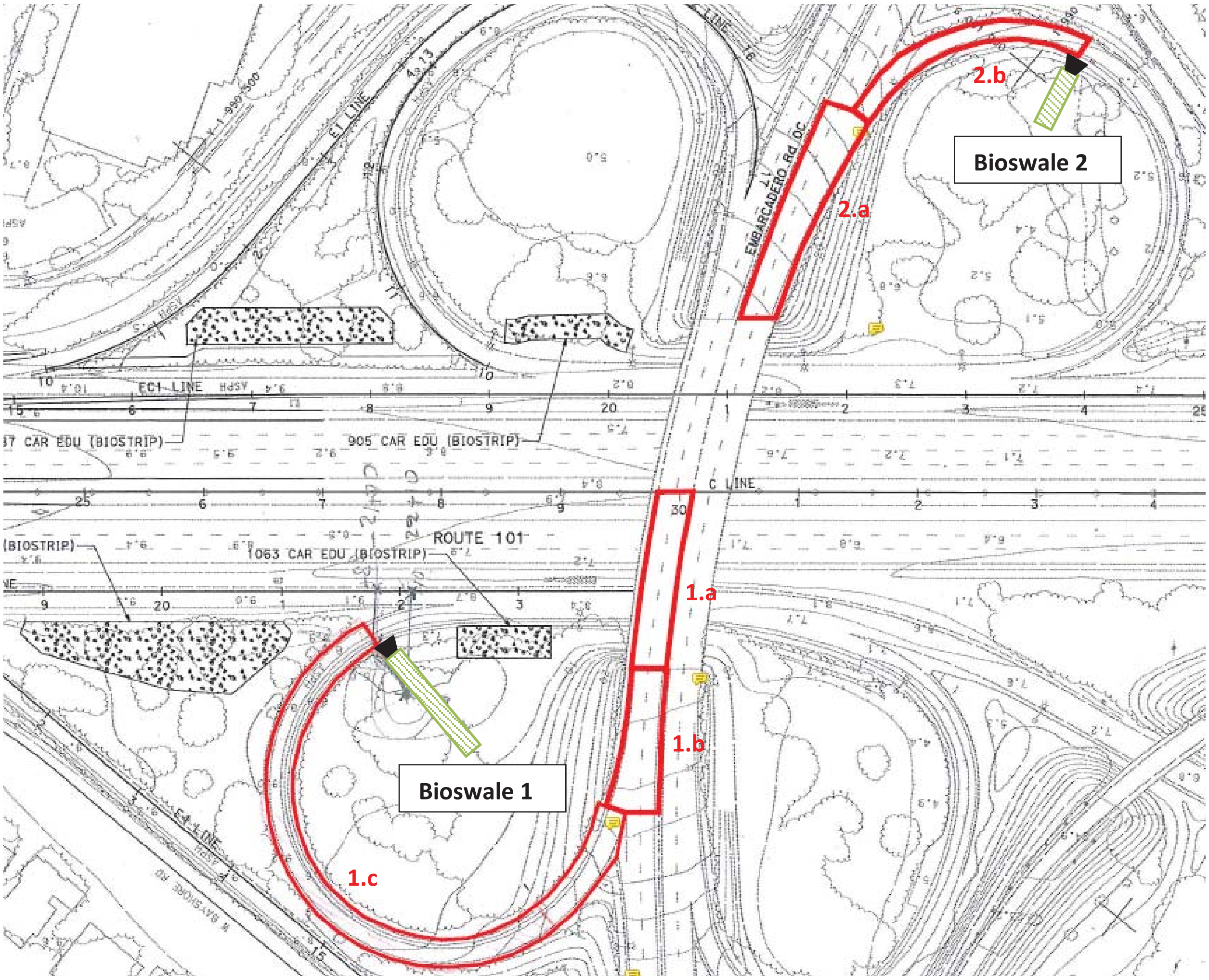
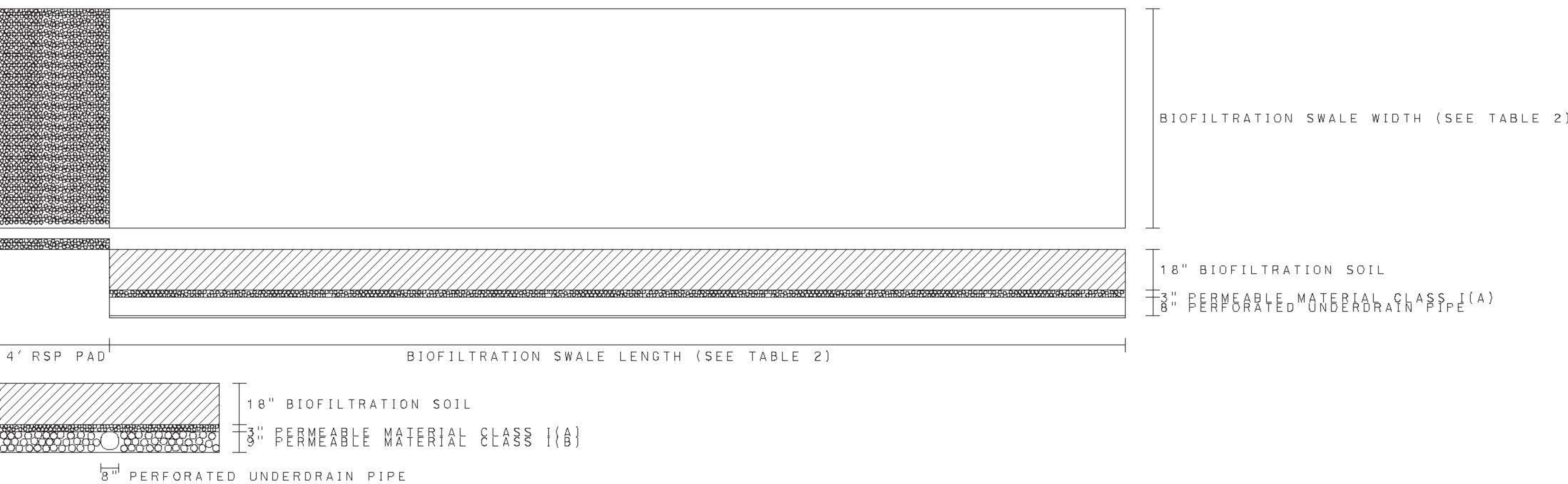


FIGURE 1 Location of Bioswales and tributary areas for each Bioswale

TABLE 2 Summary of Biowale dimensions and tributary area

No	BMP	Tributary Area		Location		Bioswale Dimensions		
				Start	End	Length	Width	Area
		SQ.FT	ACRES			FT	FT	SQ.FT
1	Bioswale 1	21,715	0.498	EC4 line, STA 22+00 60 FT RT	EC4 line, STA 22+20, 151 FT RT	109	8	872
2	Bioswale 2	9,652	0.222	EC1 line, STA 23+90, 277 FT RT	EC1 line, STA 23+50, 228 FT RT	49	8	392


BIOFILTRATION SWALE WIDTH (SEE TABLE 2)
18" BIOFILTRATION SOIL
3" PERMEABLE MATERIAL CLASS I(A)
8" PERFORATED UNDERDRAIN PIPE
4' RSP PAD
BIOFILTRATION SWALE LENGTH (SEE TABLE 2)
18" BIOFILTRATION SOIL
3" PERMEABLE MATERIAL CLASS I(A)
9" PERMEABLE MATERIAL CLASS I(B)
8" PERFORATED UNDERDRAIN PIPE

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

REPLY TO
ATTENTION OF

Regulatory Division

MAR - 4 2013

SUBJECT: File Number 2011-00088S

Mr. Jeffery Jensen
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Dear Mr. Jensen:

This correspondence is in reference to your submittal of July 7, 2011, concerning Department of the Army (DA) authorization to replace the San Francisquito Creek Bridge located at where U.S. 101 crosses San Francisquito Creek between the cities of Palo Alto and East Palo Alto, in San Mateo and Santa Clara Counties, California (37.45276, -122.12731).

Work within U.S. Army Corps of Engineers' (Corps) jurisdiction will include replacement of the bridge over San Francisquito Creek, widening the bridge to facilitate auxiliary lanes, and widening the creek channel to increase flow capacity to 100-year flood projections. Work will require replacement of the existing bridge and frontage roads with a new bridge that is 12 feet wider and 42 feet longer than the original bridge. To accommodate increased bridge length two existing pier walls will be replaced with three pier walls. Work will also include installation of cofferdams and a temporary water diversion pipe, demolition and removal of the existing bridge, excavation for abutments and installation of pier piles, installation of falsework and construction of bridge deck and pier walls, and installation of pile walls and modification of creek banks. Work will require the permanent placement of fill within 0.02 acre (261 linear feet) and will temporarily affect 0.93 acre (664 linear feet) of San Francisquito Creek. Work will also require the temporary placement of fill within 0.02 acre of wetlands associated with San Francisquito Creek. Widening of the stream channel is expected to result in an approximate 0.36 acre increase in waters of the U.S. All work shall be completed in accordance with the plans and drawings titled "*USACE File #2011-00088S, San Francisquito Creek Bridge Replacement, February 27, 2013, Figure 1 to 6*" (enclosure 1).

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

States; in former diked baylands currently below mean high water; outside the limits of mean high water but affecting the navigable capacity of tidal waters; or below the plane of ordinary high water in non-tidal waters designated as navigable waters of the United States. Navigable waters of the United States generally include all waters subject to the ebb and flow of the tide; and/or all waters presently used, or have been used in the past, or may be susceptible for future use to transport interstate or foreign commerce. A Preliminary JD has been completed for your site. Preliminary JDs are written indications that there may be waters of the U.S. on a parcel or indications of the approximate location(s) of waters of the U.S. on a parcel. Preliminary JDs are advisory in nature and may not be appealed.

Based on a review of the information in your submittal, and the current condition of the site, as verified during a field investigation on date January 7, 2013, the project qualifies for authorization under Department of the Army Nationwide Permit (NWP) 14 for Linear Transportation Projects, 77 Fed. Reg. 10,184, February 21, 2012, pursuant to Section 404 of the CWA of 1972, as amended (33 U.S.C. § 1344 *et seq.*) and Section 10 of the Rivers and Harbors Act (RHA) of 1899, as amended (33 U.S.C. § 403 *et seq.*). The project must be in compliance with the terms of the NWP, the general conditions of the Nationwide Permit Program, and the San Francisco District regional conditions cited in enclosure 2. You must also be in compliance with any special conditions specified in this letter for the NWP authorization to remain valid. Non-compliance with any term or condition could result in the revocation of the NWP authorization for your project, thereby requiring you to obtain an Individual Permit from the Corps. This NWP authorization does not obviate the need to obtain other State or local approvals required by law.

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

(http://www.spn.usace.army.mil/regulatory/index.html). Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance, enclosure 3, verifying that you have complied with the terms and conditions of the permit.

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

This Corps permit does not authorize you to take an endangered species, in particular the federally listed as threatened Central California Coast steelhead (*Oncorhynchus mykiss*) and the North American green sturgeon (*Acipencer medirostris*) or designated critical habitat for these species. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The enclosed National Marine Fisheries Service Biological Opinion (Service File Number 2010/06575, dated March 29, 2011), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological Opinion. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached Biological Opinion, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the Biological Opinion, where an "incidental take" of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The National Marine Fisheries Service is the appropriate authority to determine compliance with the terms and conditions of its Biological Opinion, and with the Endangered Species Act. The permittee must comply with all conditions of this Biological Opinion. If you are unable to comply with the terms and conditions, you must immediately notify Caltrans, the appropriate NMFS office, and the U.S. Army Corps of Engineers Regulatory office, so that Caltrans acting as the lead Federal agency for this project may consult as appropriate, prior to initiating the work, in accordance with Federal law.

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

1. To remain exempt from the prohibitions of Section 9 of the Endangered Species Act, the non-discretionary Terms and Conditions for incidental take of federally-listed Central California Coast steelhead (*Oncorhynchus mykiss*) and the North American green sturgeon (*Acipencer medirostris*) shall be fully implemented as stipulated in the Biological Opinion (pages 1- 42) dated March 29, 2011 (enclosure 4). Project authorization under the NWP is conditional upon compliance with the mandatory terms and conditions associated with incidental take. Failure to comply with the terms and conditions for incidental take, where a take of a federally-listed species occurs, would constitute an unauthorized take and non-compliance with the NWP authorization for your project. The NMFS is, however, the authoritative federal agency for determining compliance with the incidental take statement and for initiating appropriate enforcement actions or penalties under the Endangered Species Act.

2. Caltrans initiated consultation with the National Marine Fisheries Service (NMFS) to address project related impacts to Essential Fish Habitat. The conservation recommendations outlined in pages 1-5, in enclosure 5, shall be fully implemented as stipulated.

3. While temporary creek diversions are in place, appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable.

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

5. Temporary fills must be removed at the end of each construction season in their entirety. The affected area must be return to pre-construction elevations post-construction.

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

7. In the event that you are unable to implement the plan described in special condition 4 within 1-year of initiation of temporary impact to a jurisdictional feature, you must purchase credits at a Corps approved mitigation bank to compensate for the temporary impact at a 3:1 ratio. If no approved bank or in-lieu fee is available, you shall propose an alternative mitigation plan to be reviewed and approved by the Corps.

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

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

Sincerely,

Jane M. Hicks

Jane M. Hicks
Chief, Regulatory Division

Enclosures

Copies Furnished (w/o encls):

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

NON-STORMWATER INFORMATION

TABLE OF CONTENTS

ATTACHMENTS

1. Project Description

The project proposes to demolish the existing San Francisquito Creek Bridge and the two frontage road bridges and replace them with a new bridge (Project). The Project proposes to replace the existing 83-foot long by 232-foot wide San Francisquito Creek Bridge and two associated two-lane frontage roads. The new bridge structure will have 12 feet in additional width and 42 feet in additional length to accommodate the standard lane requirements of Route 101 and the anticipated flow capacity of San Francisquito Creek.

2. Construction Activities Requiring Dewatering

Abutment 1

Excavation required for 64 piles of class 200 Alternative "W" steel pipe pile with 16 inch diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -75.5 ft.

Pier 2

Excavation required for 35 piles of class 200 Alternative "W" steel pipe pile with 16 inch diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -83.5 ft.

Pier 3

Excavation required for 35 piles of class 200 Alternative "W" steel pipe pile with 16 inch diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -83.5 ft.

Pier 4

Excavation required for 33 piles of class 200 Alternative "W" steel pipe pile with 16 inch diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -83.5 ft.

Abutment 5

Excavation required for 64 piles of class 200 Alternative "W" steel pipe pile with 16 inch diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -81.0 ft.

Soundwall SW2

Excavation required for 6 piles of class 200 Alternative "Y" precast pile with 1.25 ft diameter. The piles tip elevation is -21.0 ft.

Retaining Wall "A"

Excavation required for 6 solider piles (H Piles) steel grade piles W14 x 233 with 2.5 ft diameter. The pile tip elevation will be at -28.0 ft.

Retaining Wall "B"

Excavation required for 5 solider piles (H Piles) steel grade piles W14 x 233 with 2.5 ft diameter. The pile tip elevation will be at -28.0 ft.

Retaining Wall "C"

Excavation required for 5 solider piles (H Piles) steel grade piles W14 x 233 with 2.5 ft diameter. The pile tip elevation will be at -28.0 ft.

Overhead sign

The sign will be located far away (about 1200 feet) from the bridge on the median. Excavation required for one CIDH pile Type V with 5 ft diameter and embedded length of 30 ft.

3. Treatment System Components

Treatment systems must be designed to remove turbidity-producing suspended solids, metals, and petroleum hydrocarbon constituents found in the groundwater.

Primary and secondary treatment may be required, or the design of the treatment system may require combined use of the various treatment components in series to achieve effective treatment. Ensure that the treatment system components are steam cleaned to remove any residual contaminants. Treatment system components may include:

1. Desilting basins
2. Weir tanks
3. Settling tanks
4. Sediment traps

5. Gravity bag filters
6. Sand media filters
7. Pressurized bag filters
8. Cartridge filters
9. In-line chemical coagulants and/or flocculants
10. Activated clay filters
11. Activated carbon filters
12. A combination of these systems to provide primary and secondary treatment

4. Disposal of Treated Groundwater

Use discharged treated water or uncontaminated ground or surface water for dust control in active work areas when possible, or discharge the water to an inactive area where the grade prevents sheet flow and the soil will allow percolation. The discharge point in the inactive area must include a velocity dissipater. The discharge volume must not exceed the area's capacity for percolation.

Do not discharge into a body of water where erosion, scour, or sedimentary deposits could occur that impact natural bedding or aquatic life. Monitor the water at the discharge point using water quality measurements and visual observation in conformance with the regulatory permit and the special provisions.

Storm water must be diverted away from excavations that would require dewatering.

5. Inspection, Monitoring, and Reporting

If treated groundwater is discharged to the storm drain system, perform compliance monitoring in conformance with the Monitoring and Reporting Program (MRP) included in Attachment E of the Order No. R2-2012-0012. If a batch discharge permit is obtained from a POTW, comply with the provisions contained in the batch discharge permit including all monitoring and reporting requirements.

During periods when the dewatering and non-storm water discharge operations occur, document the results in a Daily Inspection Report (DIR). The DIR form must include the discharge volume records and water quality monitoring records. In developing the DIR, refer to the Department's Dewatering Guide. The DIR form must be approved by the Engineer before use. The DIR must be provided weekly or as directed to the Engineer.

All information and recorded data collected or submitted as part of the DIR must be certified as true and accurate and signed by those who gather the information.

During each day of discharge, perform daily inspection of the effluent at the discharge site and include, in the DIR, observations of:

1. Date and Time.
2. Weather conditions,
3. Wind direction and velocity,
4. The presence or absence of water fowl or aquatic wildlife,
5. The color and clarity of the effluent discharge, and
6. Erosion or ponding downstream of the discharge site.

The DIR must include photographs of the discharge point and areas downstream of the discharge location. These photographs must be labeled with the time, date, and location.

A flow meter that has been approved by the Engineer for exclusive use in dewatering during construction must be used to measure all excavation discharges. All calibrations must be done in conformance with the manufacturer's instructions in the presence of the Engineer.

Record the flow-meter totalizer readings and compute average daily volumes for every day that dewatering is conducted.

ATTACHMENT A

ESTIMATED GROUNWATER SEEPAGE RATES IN THE PROJECT AREA

Memorandum

Flex your power!
Be energy efficient!

To: MR. HARDEEP TAKHAR
District Office Chief
Office of Water Quality

Attention: J. Chen

Date: April 24, 2013

File: 04- SCL- SM- 101 PM 0.0
04 – 235621
San Francisquito Creek Bridge
(Seepage Rate)

From: RIFAAT NASHED RN
Engineering Geologist
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

CHRIS RISDEN
Acting Chief, Branch B
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject : Seepage Rate (Flow Rate) Estimate at San Francisquito Creek Bridge Location

This memo is in response to your request to provide the groundwater depth and seepage rate for 11 construction elements: Abutment 1, Pier 2, 3 and 4, Abutment 5, Soundwall SW1, Soundwall SW2, Retaining Wall A, Retaining Wall B, Retaining Wall C, and Overhead sign located in the project site. It is our understanding that this information will be used in estimating dewatering quantities.

It should be noted that in our estimate in all the locations of construction elements, we considered the maximum depth of excavation under the groundwater elevation. The groundwater measured in borehole R-10-001 is at depth of 13 ft below the ground surface (1.5 ft elevation) and the groundwater measured in borehole R-10-002 is at depth of 14 ft below the ground surface (1.1 ft elevation).

Abutment 1

For this location, our estimates are limited to the excavation required for 64 piles of Class 200 Alternative "W" steel pipe pile with 16 inch (1.33 ft) diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -75.5 ft.

Based on the LOTB of boring R-10-001 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: lean clay with sand and silt (CL), poorly graded sand with silt and gravel (SP-SM), poorly graded gravel (GP), silty sand (CL-ML), and lean clay (CL).

By using a Coefficient of Permeability, K, value of 0.0027 ft /day for lean clay, 0.14 ft /day for poorly graded sand with silt, 13.7 ft /day for poorly graded gravel, 0.14 ft /day for silty sand and 0.00027 ft /day for silty clay the seepage rate for this location is approximately 15.5 gallon/day/ft^2.

Pier 2

For this location, our estimates are limited to the excavation required for 35 piles of Class 200 Alternative "W" steel pipe pile with 16 inch (1.33 ft) diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -83.5 ft.

Based on the LOTB of boring R-10-001 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: lean clay with sand and silt (CL), poorly graded sand with silt and gravel (SP-SM), poorly graded gravel (GP), silty sand (CL-ML), and lean clay (CL)

By using a Coefficient of Permeability, K, value of 0.0027 ft /day for lean clay, 0.14 ft /day for poorly graded sand with silt, 13.7 ft /day for poorly graded gravel, 0.14 ft /day for silty sand and 0.00027 ft /day for silty clay the seepage rate for this location is approximately 15.5gallon/day/ft^2.

Pier 3

For this location, our estimates are limited to the excavation required for 35 piles of Class 200 Alternative "W" steel pipe pile with 16 inch (1.33 ft) diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -83.5 ft.

Based on the LOTB of boring R-10-002 and R-10-003 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: silty sand (SM), lean clay (CL) and fat clay (CH), poorly graded sand with silt and gravel (SP-SM), silt with sand (ML).

By using a Coefficient of Permeability, K, value of 0.0027 ft /day for lean clay, 1.4 ft /day for poorly graded sand with silt and gravel, 13.7 ft /day, 0.14 ft /day for silty sand and 0.00027 ft /day for Lean clay and fat clay, the seepage rate for this location is approximately 5.5 gallon/day/ft^2.

Pier 4

For this location, our estimates are limited to the excavation required for 33 piles of Class 200 Alternative "W" steel pipe pile with 16 inch (1.33 ft) diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -83.5 ft.

Based on the LOTB of boring R-10-002 and R-10-003 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: silty sand (SM), lean clay (CL) and fat clay (CH), poorly graded sand with silt and gravel (SP-SM), Silt with sand (ML).

By using a Coefficient of Permeability, K, value of 0.0027 ft /day for lean clay, 1.4 ft /day for poorly graded sand with silt and gravel, 13.7 ft /day, 0.14 ft /day for silty sand and 0.00027 ft /day for lean clay and fat clay, the seepage rate for this location is approximately 6.0 gallon/day/ft^2.

Abutment 5

For this location, our estimates are limited to the excavation required for 64 piles of Class 200 Alternative "W" steel pipe pile with 16 inch (1.33 ft) diameter and pre-drill hole at least 2/3 ft larger than the pile size to elevation -21 from the original ground surface. The piles tip elevation is -81.0 ft.

Based on the LOTB of boring R-10-002 and R-10-003 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: Silty Sand (SM),lean clay (CL) and Fat Clay (CH), Poorly graded sand with silt and gravel (SP-SM), Silt with sand (ML).

By using a Coefficient of Permeability, K, value of 0.0027 ft /day for lean clay, 1.4 ft /day for poorly graded sand with silt and gravel, 13.7 ft /day, 0.14 ft /day for silty sand and 0.00027 ft /day for Lean clay and fat clay, the seepage rate for this location is approximately 11.0 gallon/day/ft^2.

Soundwall SW1

For this location, our estimates are limited to the excavation required for 7 piles of Class 200 Alternative "Y" precast pile with 1.25 ft diameter. The pile tip elevation will be at -17.0 ft.

Based on the LOTB of boring R-10-003 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: silt with sand (ML), fat clay (CH), silty sand with gravel (SM).

By using a Coefficient of Permeability, K, value of 0.14 ft /day for silty sand, 0.000027 ft /day for fat clay, 1.4 ft /day for poorly graded sand with silt and gravel, the seepage rate for this location is approximately 3.0 gallon/day/ft^2.

Soundwall SW2

For this location, our estimates are limited to the excavation required for 6 piles of Class 200 Alternative "Y" precast pile with 1.25 ft diameter. The pile tip elevation will be at -21.0 ft.

Based on the LOTB of boring R-10-003 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: silt with sand (ML), fat clay (CH), silty sand with gravel (SM) and silty gravel (GM).

By using a Coefficient of Permeability, K, value of 0.14 ft /day for silty sand, 0.000027 ft /day for fat clay, 1.4 ft /day for poorly graded sand with silt and gravel, 2.7 ft/day for silty gravel, the seepage rate for this location is approximately 3.0 gallon/day/ft^2.

Retaining Wall "A"

For this location, our estimates are limited to the excavation required for 6 Solider piles (H-Piles) steel grade piles W14 x 233 with 2.5 ft diameter. The pile tip elevation will be at -28.0 ft.

Based on the LOTB of boring R-10-002 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: silty sand (SM), lean clay with sand (CL), poorly graded sand with silt and gravel (SP-SM).

By using a Coefficient of Permeability, K, value of 0.14 ft /day for silty sand, 0.0027 ft /day for lean clay, and 0.14 ft /day for poorly graded sand with silt and gravel, the seepage rate for this location is approximately 0.5 gallon/day/ft^2.

Retaining Wall "B"

For this location, our estimates are limited to the excavation required for 5 Solider piles (H-Piles) steel grade piles W14 x 233 with 2.5 ft diameter. The pile tip elevation will be at -28.0 ft.

Based on the LOTB of boring R-10-003 drilled in August 2010, the soil layers at and below the groundwater level and extend to the bottom of the excavation are described as: silty sand (SM), lean clay with sand (CL), poorly graded sand with silt and gravel (SP-SM).

By using a Coefficient of Permeability, K, value of 0.14 ft /day for silty sand, 0.0027 ft /day for lean clay, and 0.14 ft /day for Poorly graded sand with silt and gravel, the seepage rate for this location is approximately 0.5 gallon/day/ft^2.

Retaining Wall "C"

For this location, our estimates are limited to the excavation required for 5 Solider piles (H-Piles) steel grade piles W14 x 233 with 2.5 ft diameter. The pile tip elevation will be at -28.0 ft.

Based on the LOTB of boring R-10-003 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: silt with sand (ML), fat clay (CH), silty sand with gravel (SM) and silty gravel (GM), and lean clay (CL).

By using a Coefficient of Permeability, K, value of 0.14 ft /day for silty sand, 0.000027 ft /day for Fat clay, 1.4 ft /day for poorly graded sand with silt and gravel, 2.7 ft/day for silty gravel, and 0.0027 ft/day, the seepage rate for this location is approximately 1.5 gallon/day/ft^2.

Overhead sign

The sign will be located far away (about 1200 feet) from the bridge on the median. Our estimates are limited to the excavation required for one CIDH pile Type V with 5 ft diameter and embedded length of 30 ft.

Based on the LOTB of boring R-10-001 drilled in August 2010, the soil layers at and below the groundwater level and extending to the bottom of the excavation are described as: poorly graded sand with silt and gravel (SP-SM), and lean clay with sand (CL)

By using a Coefficient of Permeability, K, value of 0.0027 ft /day for lean clay with sand, 0.14 ft /day for poorly graded sand with silt and gravel the seepage rate for this location is approximately 0.5gallon/day/ft^2.

According to "The Federal Highway Report NO. FHWA-TS-80-224, Page 48-49" the Coefficient of Permeability, K, (ft/day) for all soils encountered in the Francisquito Creek Bridge area are as follows:

Unified Soil Classification	Coefficient of Permeability K (ft./day)
Poorly graded gravel (GW)	13.7 to 27,400
Gravel with silt (GM)	2.7^{-4}x 27
Silt (ML)	2.7×10^{-5} to 0.14
Poorly graded sand (SP)	0.14 to 1.4
Silty sand (SM)	2.7×10^{-4} to 1.4
Clayey Sand (SC)	2.7×10^{-5} to 0.14
Lean clay (CL)	2.7×10^{-5} to 2.7×10^{-3}
Fat clay (CH)	2.7×10^{-7} to 2.7×10^{-5}

Our estimate of the average seepage rate (flow rate) for the entire project area is approximately 1.0 gallons /day/ $ft^{2.}$ The seepage rate (flow rate) estimates provided in this memo are for cost estimate purposes only. The contractor expected to perform his own calculations to estimate flow rate for his purposes.

If you have any questions or need additional information, please call Rifaat Nashed at (510) 622-1773 or Chris Risden, Acting Branch Chief at (510) 266-8757.

c: TPokrywka, CRisden, Daily File

RNashed/mm

SAN FRANCISQUITO CREEK BRIDGE

SEEPAGE RATE FOR THE WHOLE BOREHOLE

STRUCTURE ELEMENT	SOIL	Length (ft)/ Bed thickness	Perimeter (ft)	No of Piles/Holes	A (ft^2)	K (ft/day)	H (ft)	H_0 (ft)	dH (ft)	d S (ft)	i	q total (ft^3/day)	q total (Gallon/day)	q total (Gallon/day/ft^2)
Abutment 1	SP-SM	5.00	6.28	64	2009.6	0.14	1.5	-75.50	77.00	292.6	0.26315789	4122.2	30762.7	15.3
	SP-SM	7.00	4.18	64	1872.64	0.14	1.5	-75.50	77.00	292.6	0.26315789			
	CL	41.50	4.18	64	11102.08	0.0027	1.5	-75.50	77.00	292.6	0.26315789			
	GP	4.00	4.18	64	1070.08	13.7	1.5	-75.50	77.00	292.6	0.26315789			
	SM	11.50	4.18	64	3076.48	0.14	1.5	-75.50	77.00	292.6	0.26315789			
	CL-ML	1.00	4.18	64	267.52	0.00027	1.5	-75.50	77.00	292.6	0.26315789			
Pier 2	SP-SM	5.00	6.28	35	1099	0.14	1.5	-83.50	85.00	323	0.26315789	2270.6	16944.4	15.4
	SP-SM	10.00	4.18	35	1463	0.14	1.5	-83.50	85.00	323	0.26315789			
	CL	41.50	4.18	35	6071.45	0.0027	1.5	-83.50	85.00	323	0.26315789			
	GP	4.00	4.18	35	585.2	13.7	1.5	-83.50	85.00	323	0.26315789			
	SM	11.50	4.18	35	1682.45	0.14	1.5	-83.50	85.00	323	0.26315789			
	CL-ML	6.00	4.18	35	877.8	0.00027	1.5	-83.50	85.00	323	0.26315789			
Pier 3	SM	6.00	6.28	35	1318.8	0.14	1.1	-83.50	84.60	321.48	0.26315789	958.9	7156.1	5.4
	CL +CH	1.00	6.28	35	219.8	0.00027	1.1	-83.50	84.60	321.48	0.26315789			
	CL +CH	12.00	4.18	35	1755.6	0.00027	1.1	-83.50	84.60	321.48	0.26315789			
	SM	5.00	4.18	35	731.5	0.14	1.1	-83.50	84.60	321.48	0.26315789			
	SP-S Mw/ GM	9.00	4.18	35	1316.7	1.4	1.1	-83.50	84.60	321.48	0.26315789			
	SP	6.00	4.18	35	877.8	1.4	1.1	-83.50	84.60	321.48	0.26315789			
	ML	13.50	4.18	35	1975.05	0.14	1.1	-83.50	84.60	321.48	0.26315789			
	CL	19.00	4.18	35	2779.7	0.0027	1.1	-83.50	84.60	321.48	0.26315789			
Pier 4	SM	6.00	6.28	33	1243.44	0.14	1.1	-83.50	84.60	321.48	0.26315789	952.5	7107.9	5.7
	CL -CH	1.00	6.28	33	207.24	0.00027	1.1	-83.50	84.60	321.48	0.26315789			
	CL -CH	12	6.28	33	2486.88	0.00027	1.1	-83.50	84.60	321.48	0.26315789			
	SM	14.50	4.18	33	2000.13	0.14	1.1	-83.50	84.60	321.48	0.26315789			
	SP-SM w/ GM	9.00	4.18	33	1241.46	1.4	1.1	-83.50	84.60	321.48	0.26315789			
	SP	6.00	4.18	33	827.64	1.4	1.1	-83.50	84.60	321.48	0.26315789			
	ML	13.50	4.18	33	1862.19	0.14	1.1	-83.50	84.60	321.48	0.26315789			
	CL	19.00	4.18	33	2620.86	0.0027	1.1	-83.50	84.60	321.48	0.26315789			
Abutment 5	SM	6.00	6.28	33	1243.44	0.14	1.1	-81.00	82.10	311.98	0.26315789	1804.0	13463.0	10.8
	CL-CH	1.00	6.28	64	401.92	0.00027	1.1	-81.00	82.10	311.98	0.26315789			
	CL-CH	12.00	4.18	64	3210.24	0.00027	1.1	-81.00	82.10	311.98	0.26315789			
	SM	14.50	4.18	64	3879.04	0.14	1.1	-81.00	82.10	311.98	0.26315789			
	SP-SM w/GM	9.00	4.18	64	2407.68	1.4	1.1	-81.00	82.10	311.98	0.26315789			
	SP	6.00	4.18	64	1605.12	1.4	1.1	-81.00	82.10	311.98	0.26315789			
	ML	13.50	4.18	64	3611.52	0.14	1.1	-81.00	82.10	311.98	0.26315789			
	CL	19.00	4.18	64	5082.88	0.0027	1.1	-81.00	82.10	311.98	0.26315789			
SW1	ML	7.00	3.93	7	192.57	0.14	1.1	-17	18.10	68.78	0.26315789	68.9	514.3	2.7
	CH	5.00	3.93	7	137.55	0.000027	1.1	-17	18.10	68.78	0.26315789			
	SM w/gravel	6.10	3.93	7	167.811	1.4	1.1	-17	18.10	68.78	0.26315789			
SW2	ML	7.00	3.93	6	165.06	0.14	1.1	-21	22.10	83.98	0.26315789	56.2	419.1	2.5
	CH	5.00	3.93	6	117.9	0.000027	1.1	-21	22.10	83.98	0.26315789			
	SM	7.50	3.93	6	176.85	0.14	1.1	-21	22.10	83.98	0.26315789			
	GM	2.60	3.93	6	61.308	2.7	1.1	-21	22.10	83.98	0.26315789			
Ret. Wall A	SM	14.50	7.85	6	682.95	0.14	1.1	-28	29.10	110.58	0.26315789	40.9	305.4	0.4
	CL	4.50	7.85	6	211.95	0.0027	1.1	-28	29.10	110.58	0.26315789			
	SP-SM	9.00	7.85	6	423.9	0.14	1.1	-28	29.10	110.58	0.26315789			
Ret. Wall B	SM	14.50	7.85	5	569.125	0.14	1.1	-28	29.10	110.58	0.26315789	34.1	254.5	0.4
	CL	4.50	7.85	5	176.625	0.0027	1.1	-28	29.10	110.58	0.26315789			
	SP-SM	9.00	7.85	5	353.25	0.14	1.1	-28	29.10	110.58	0.26315789			
Ret. Wall C	ML	13.00	7.85	5	510.25	0.14	1.1	-28	29.10	110.58	0.26315789	99.4	742.1	1.5
	CH	2.50	7.85	5	98.125	0.000027	1.1	-28	29.10	110.58	0.26315789			
	SM	7.50	7.85	5	294.375	0.14	1.1	-28	29.10	110.58	0.26315789			
	GM	2.50	7.85	5	98.125	2.7	1.1	-28	29.10	110.58	0.26315789			
	CL	2.50	7.85	5	98.125	0.0027	1.1	-28	29.10	110.58	0.26315789			
Ovrhead Sign	SP-SMw/GM	7.00	10.7	1	74.9	0.14	1.5	-15.5	17.00	64.6	0.26315789	2.8	21.2	0.3
	CL	10.00	10.7	1	107	0.0027	1.5	-15.5	17.00	64.6	0.26315789			
Total					80801.679							10410.6	77690.8	1.0

q = KiA

Notes

Length = bed thickness
Perimeter = is the circumference of the pile (hole) = 2 PI r/or width of of hole - trench
A = The cylender surface area = 2 PI r x Length
k = Soil permeability (from Hwy Subdrainage Design Report No. FHWA - TS-80-224- Page 48-49)
H = ground water elevation
H0 = the pile tip (bottom of the hole) elevation
dH = water head
ds = gradient distance Li = 3.8x(H - H0)............Ref. FHWA-Ts-80-224 Page 66
"i" = dH/ds
q total = (gallon/day/ft2) = q total (gallon/day)/ total surface area

ATTACHMENT B

DEWATERING LOCATION PLAN

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

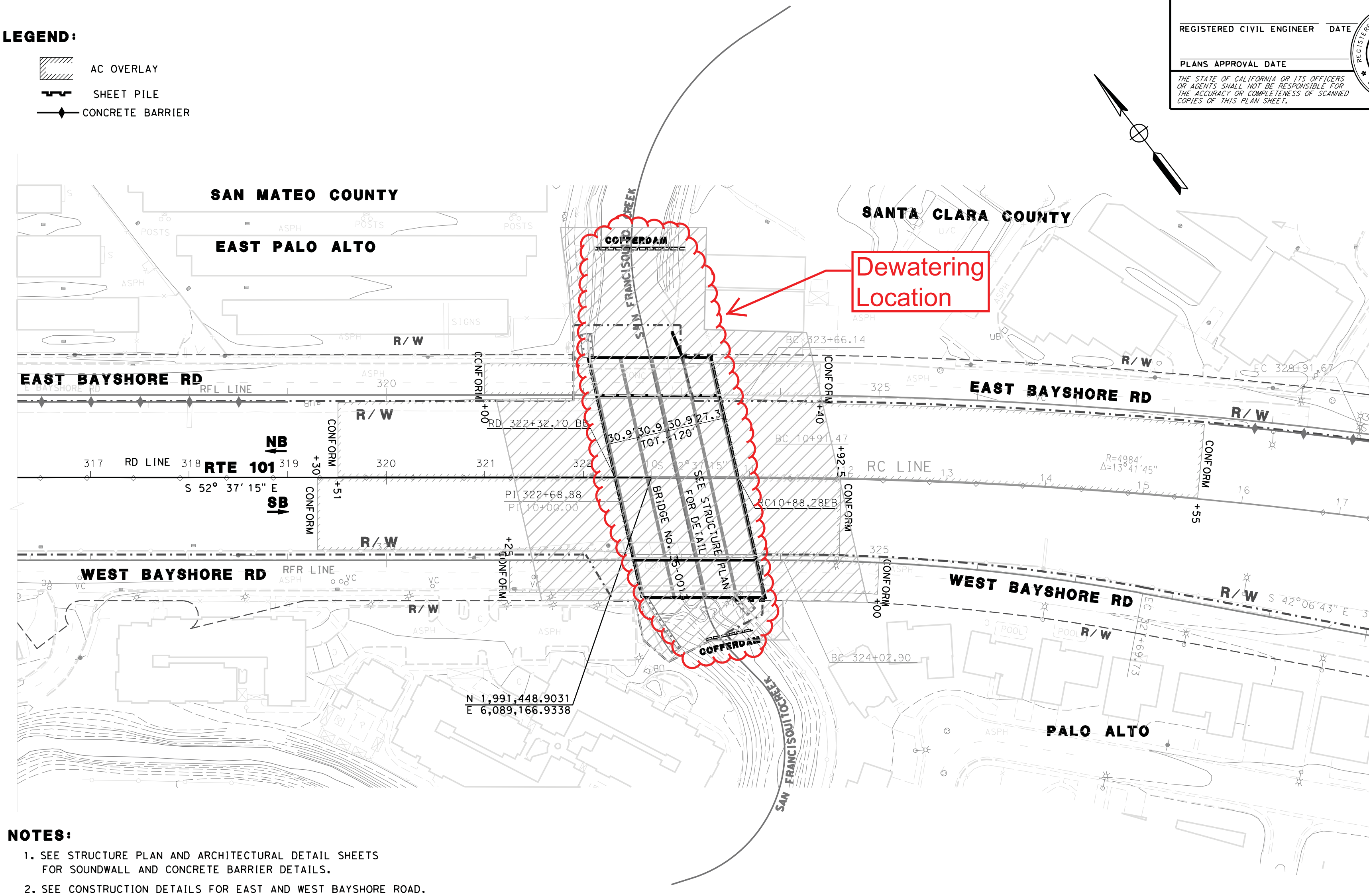
REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

LEGEND:

AC OVERLAY

SHEET PILE

CONCRETE BARRIER



NOTES:

1. SEE STRUCTURE PLAN AND ARCHITECTURAL DETAIL SHEETS FOR SOUNDWALL AND CONCRETE BARRIER DETAILS.
2. SEE CONSTRUCTION DETAILS FOR EAST AND WEST BAYSHORE ROAD.
3. SEE STRUCTURE PLAN FOR BRIDGE DETAILS.

SAN FRANCISQUITO CREEK BRIDGE REPLACEMENT LAYOUT (REVISION 5)

SCALE: 1" : 50'

L-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

FUNCTIONAL SUPERVISOR

CALCULATED-DESIGNED BY CHECKED BY

REVISED BY DATE REVISED

LAST REVISION 00-00-00 DATE PLOTTED => $DATE TIME PLOTTED => $TIME

BORDER LAST REVISED 7/2/2010

USERNAME => $USER DGN FILE => $REQUEST

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

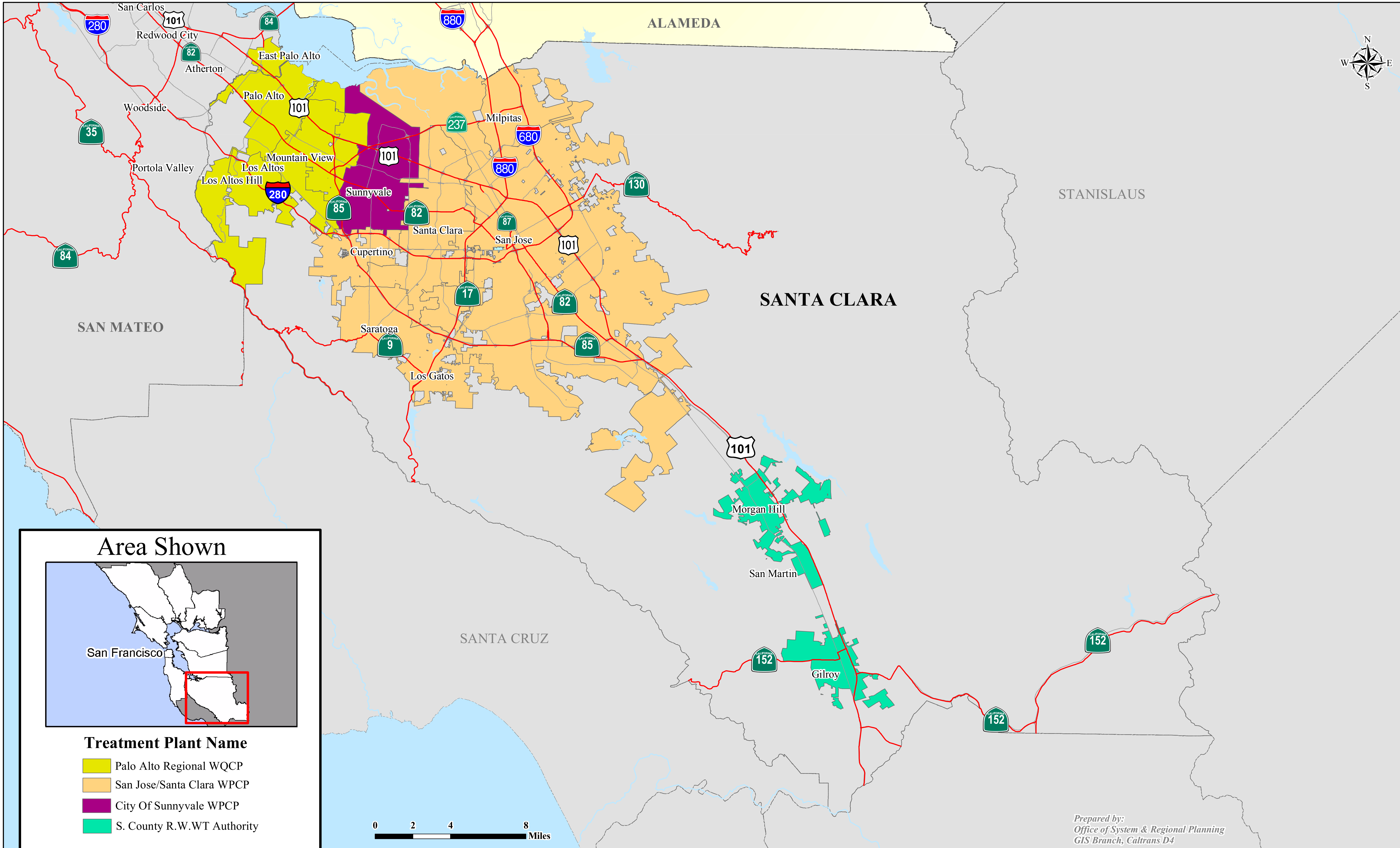
UNIT 0000

PROJECT NUMBER & PHASE 00000000001

ATTACHMENT C

PUBLICLY-OWNER TREATMENT WORKS (POTW) FACILITY INFORMATION

Santa Clara County - POTW Service Areas

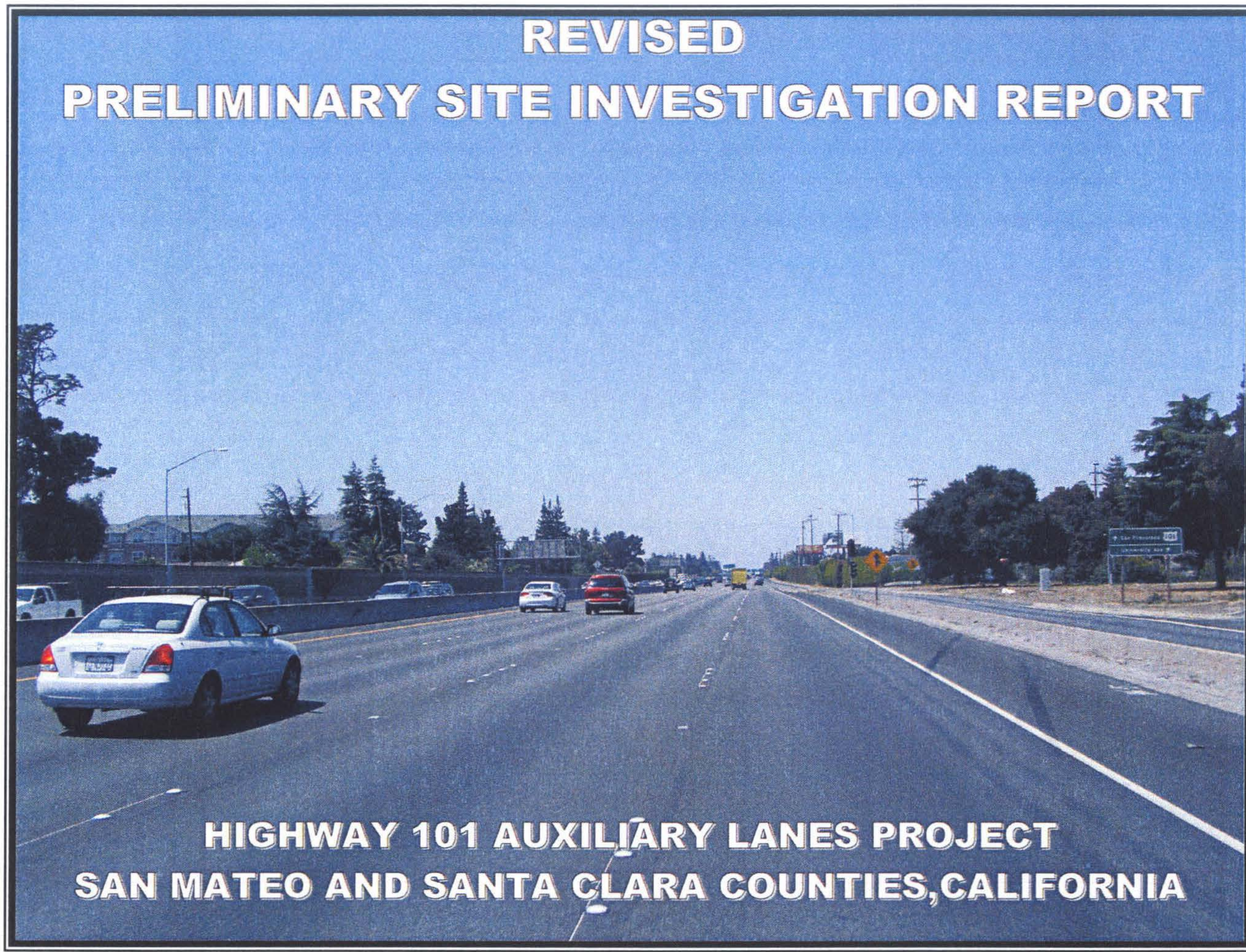


	City Discharger	Treatment Plant Name	WDR Discharger Name	Discharger Contact Name	Contact Phone No.	Contact Email	Mail Address	Ct Contact for Groundwater & De-Watering Discharges	Service Area of the POTW
67	City of Palo Alto Regional WQCP	City of Palo Alto Regional WQCP	City of Palo Alto Regional WQCP	Phil Bobel	650-329-2285	phil_bobel@city.palo-alto.ca.us	2501 Embarcadero Way, Palo Alto, 94303	Best Contact: Javad Ghaffari @ 650-329-2285 Need Exceptional Discharge Permit ($750), then $3.40 per 1,000 gals, testing. Has limited capacity, discouraged during winter. See: cleanbay@cityofpaloalto.org	Service Area is : Los Altos, Los Altos Hills, Mt. View, Palo Alto, Stanford & East Palo Alto Sanitation District
68			City of Palo Alto	Bill Gray	650-496-6932(ph); 650-496-6924	bill_gray@city.palo-alto.ca.us	Bill Gray, Manager-Water, Gas, Wastewater Utilities Operaions, City of Palo Alto, 3201 East Bayshore Blvd., Palo Alto, CA 94303	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
69			Los Altos Hills	Mintze Cheng	650-941-7222(ph); 650-941-3160(fax)	mcheng@losaltoshills.ca.gov	Mintze Cheng, Director of Public Works,Town of Los Altos Hills, 26379 Fremont Road, Los Altos Hills, CA 94022	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
70			City of Los Altos	Jim Porter	650-948-1491(ph); 650-941-7419(fax)	jim.porter@ci.los-altos.ca.us	Jim Porter, Director of Public Works, City of Los Altos, 1 N. San Antonio Road, Los Altos, CA 94022	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
71			East Palo Alto SD	Karen Maxey	650-325-9021	kmaxey@epasd.com	Karen Maxey, Acting General Manager, East Palo Alto Sanitary District, P.O. Box 51686, Palo Alto, CA 94303	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
72			City of Mountain View	David Serge	650-903-6239	dave.serge@ci.mtnview.ca.us	Dave Serge, Utility Manager, 231 North Whisman Road, P.O. Box 7540, Mountain View, CA 94039-7540	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
73			Stanford University	Marty Laporte	650-725-7864 (phone); 650-723-3191(fax)	martyl@bonair.stanford.edu	Marty Laporte, Manager of Water Resources and Environmental Quality Stanford Utilities Department, 327 Bonair Siding, Stanford University, Stanford, CA 94305-7270	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
74			Foothill College	David Paulsen	650-949-6122 (phone); 650-948-5194 (fax)	paulsend@admin.fhda.edu	David Paulsen, Coordinator, Foothill College, 12345 Altos Hills, CA 94022	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
75			Veterans Administration Hospital	Debasis Malakar	650-493-5000, ext. 64786(ph); 650-849-0117	debasis.malakar@med.va.gov	Debasis Malakar, Industrial Hygienist, VA Palo Alto Health Care System, 3801 Miranda Ave. Palo Alto, CA 94304	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
76			NASA Ames Research Center	Dana Bolles	650-604-3145(ph); 650-604-6508(fax)	dbolles@mail.arc.nasa.gov	Dana Bolles, Environmental Engineer, NASA Ames Research Center, DOH:218-1, Moffett Field, CA 94035-1000	Same as City of Palo Alto Regional WQCP - see line # A-67	Part of Palo Alto Regional WQCP - see line # A - 67
77	San Jose/Santa Clara WPCP	San Jose/Santa Clara WPCP	San Jose/Santa Clara WPCP	Ron Garner	408-945-5316	ron.garner@ci.si.ca.us	Ron Garner, Deputy Director, 700 Los Esteros Rd., San Jose, CA 95134	Best contact is permit writer Joe Denk 408-945-5482 and see website:www.ci.san-jose.ca.us/esd/eeforms.htm	San Jose, Santa Clara, Milpitas,Campbell, Cupertino, Los Gatos, Saratoga, Monte Sereno. Plant phone is 408-945-5300
78			City of San Jose	Jim Helmer Joe Garcia	408-277-4945 408 277-2554	jim.helmer@ci.sj.ca.us hoe.garcia@ci.sj.ca.us	Jim Helmer, Director Dept. of Transporatation, 4 North Second St. Ste. 1000, San Jose, CA 95113	Same as San Jose/Santa Clara WPCP - see Line # A-77	They send their WW to SanJose/Santa Clara WPCP for treatment See Line # A 77
79			City of Milpitas	Steve Smith	408-586-2640	ssmith@ci.milpitas.ca.gov	Steve Smith, Acting Director of Public Works, 455 E. Calaveras, Milpitas, CA 95035	Same as San Jose/Santa Clara WPCP - see Line # A -77	They send their WW to SanJose/Santa Clara WPCP for treatment See Line # A 77
80			Cupertino Sanitary District	David Ross	408-253-7071	dross@cu.mthomas.com	David Ross, District Manager, Cuertino San. District, 20065 Stevens Creek Blvd., Cupertino, CA 95014	Same as San Jose/Santa Clara WPCP - see Line # A -77	They send their WW to SanJose/Santa Clara WPCP for treatment See Line # A 77
81			West Valley SD	Bob Reid	408-378-2407	rreid@wvsd.dst.ca.us	Robert Reid, District Manager, West Valley Sanitation District, 100 E. Sunnyoaks Ave., Campbell, CA 95008	Same as San Jose/Santa Clara WPCP - see Line # A -77	They send their WW to SanJose/Santa Clara WPCP for treatment See Line # A 77
82			City of Santa Clara	Robin Saunders	408-615-2011	rsaunders@ci.santaclara.ca.us	Robin Saunders, Director of Water & Sewer Utilities, 1500 Warburton Ave., Santa Clara, CA 95050	Same as San Jose/Santa Clara WPCP - see Line # A -77	They send their WW to SanJose/Santa Clara WPCP for treatment See Line # A 77
83			Burbank Sanitary District	Ken Kuebler	408-286-4401	bsburbank@aol.com	Ken Kuebler, Board Secretary, Burbank Sanitary District, 97 Boston Ave., San Jose, CA 95128	Same as San Jose/Santa Clara WPCP - see Line #A - 77	They send their WW to SanJose/Santa Clara WPCP for treatment See Line # A 77
84			Sunol Sanitary District	Steve Oster	408-456-2049 or 530-886-8225	steve2002@starband.net	Steve Oster, Sunol Sanitary District, 253 Lincoln Ave., San Jose, CA 95126	Same as San Jose/Santa Clara WPCP - see Line #A- 77	They send their WW to SanJose/Santa Clara WPCP for treatment See Line # A 77
85			County Sanitation District #2-3	Sid Nash	408-453-5373	snash@cu.mthomas.com	Sid Nash, Mark Thomas Co., 90 Archer St., San Jose, CA 95112	Same as San Jose/Santa Clara WPCP - see Line # A -77	They send their WW to SanJose/Santa Clara WPCP for treatment See Line # A 77
86	City of Sunnyvale WPCP	City of Sunnyvale WPCP	City of Sunnyvale WPCP	Jim Craig	408-730-7558	jcraig@ci.sunnyvale.ca.us	Jim Craig, Field Services Superintendent, Dept. of Public Works, City of Sunnyvale P.O. Box 3707, Sunnyvale, CA 94088-3707	Best contact is "pre-treatment coordinator" Robert Gallo @ 408-730-7737 - would depend on the source of the water, some permit exemptions for groundwater, need estimates of quantities, etc. [Knowledgeable: Christy McCumby 408-730-7274]	Serves the City of Sunnyvale and a very small part of Cupertino.

ATTACHMENT D

SITE INVESTIGATION REPORT

REVISED
PRELIMINARY SITE INVESTIGATION REPORT



HIGHWAY 101 AUXILIARY LANES PROJECT
SAN MATEO AND SANTA CLARA COUNTIES, CALIFORNIA

PREPARED FOR:
CALTRANS DISTRICT 4
OFFICE OF ENVIRONMENTAL ENGINEERING
111 GRAND AVENUE, MS8C
OAKLAND, CA 94612

Caltrans

PREPARED BY:
GEOCON CONSULTANTS, INC.
6671 BRISA STREET
LIVERMORE, CALIFORNIA

GEOCON

GEOCON PROJECT NO. E8435-06-36
CALTRANS EA 04-235611

DECEMBER 2009
(Revised August 2011)

TABLE OF CONTENTS

REVISED PRELIMINARY SITE INVESTIGATION REPORT Page

REPORT LIMITATIONS

This report has been prepared exclusively for the State of California Department of Transportation (Caltrans) District 4. The information contained herein is only valid as of the date of the report and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. Geocon strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

The contents of this report reflect the views of the author who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

GEOCON CONSULTANTS, INC.

PROFESSIONAL GEOLOGIST
RICHARD W. DAY
No. 5479
Exp. 09-30-11
STATE OF CALIFORNIA

Richard Day, CEG, CHG
Senior Geologist, Vice President

CALIFORNIA DEPARTMENT OF TRANSPORTATION – DISTRICT 4
OFFICE OF ENVIRONMENTAL ENGINEERING

Reviewed By:	Recommended By:	Approved By:
Ana Uribe	Chris Wilson, PE	Allen Baradar, PE, REA
Task Order Manager	District Branch Chief	District Office Chief

PROJECT TEAM

Contact	Affiliation	Responsibility
Chris Wilson, PE 510.286.5647 510.286.5642 fax chris_wilson@dot.ca.gov	Caltrans – District 4 Environmental Engineering 111 Grand Avenue, 14th Floor Oakland, California 94612	District Branch Chief
Ana Uribe. 510.286.4914 510.286.5728 fax ana_uribe@dot.ca.gov	Caltrans – District 4 Environmental Engineering 111 Grand Avenue, 14th Floor Oakland, California 94612	Task Order Manager
Richard Day, CEG, CHG John Love, PG Lauren Vigliotti 925.371.5900 925.371.5915 fax livermore@geoconinc.com	Geocon Consultants, Inc. 6671 Brisa Street Livermore, CA 94550 (*Caltrans Contractor*)	Project Management Sample Collection Field QA/QC Investigation Report
Mr. John McAssey 925.521.1490 925.521.1494 fax jmcassey@vironex.com	Vironex 5292 Pacheco Boulevard Pacheco, CA 94553 *(Geocon Subcontractor)*	Drilling Contractor
Mr. Robert Cruz 831.461.1467 813.461.1470 fax cruzbros@att.net	Cruz Brothers Locators 3004 Bean Creek Road Scotts Creek, CA 95067 *(Geocon Subcontractor)*	Utility Locator
Ms. Terri Rodgers 408.436.1127 408.436.1675 fax trodgers@www.dmtraffic.com	D & M Traffic Services, Inc. 845 Reed street Santa Clara, CA 95050 *(Geocon Subcontractor)*	Traffic Control Contractor
Doug Krause, CIH 530.758.6397 530.758.6506 fax dskrause@pacbell.net	Krause & Associates 216 F. Street, Suite 162 Davis, CA 95616 (*Geocon Subcontractor*)	Health and Safety
Diane Galvan 562.989.4045 562.989.4040 fax diane@atlglobal.com	Advanced Technology Laboratories 1510 E. 33rd Street Signal Hill, CA 90807 (*Geocon Subcontractor*)	Sample Analysis

EXECUTIVE SUMMARY

We prepared this Revised Preliminary Site Investigation Report for the United States Highway 101 (US 101) Auxiliary Lane Addition project under California Department of Transportation (Caltrans) Contract No. 04A2912 and Task Order (TO) 36, EA 04-235611. The project location is depicted on the Vicinity Map, Figure 1, and the Site Plan, Figure 2.

The purpose of the investigation was to evaluate the concentrations of metals, including aerially deposited lead (ADL), in soil and total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) in soil and groundwater at the Site. The information obtained from this investigation will be used by Caltrans to determine soil disposal costs and to identify health and safety concerns during proposed construction activities.

The field investigation was performed on August 10-13, 18, 24, 25, and 31, 2009, by Geocon staff John Love, Professional Geologist (PG), and Chris Merritt, PG. The following field activities were performed during the sampling efforts:

- Advanced a total of 136 soil borings at the Site to a maximum depth of 18 feet using direct-push drilling and hand-auger techniques. One-hundred-twenty-three borings were advanced to a depth of 2.5 feet, nine borings were advanced to a depth of 6 feet, and four borings were advanced to a depth of 18 feet.
- Collected a total of 438 soil samples. Selected soil samples were analyzed for total and soluble lead, California Assessment Manual (CAM) 17 metals, TPH and/or VOCs.
- Collected four grab-groundwater samples for analysis of TPH and VOCs.
- Transported samples to Advanced Technology Laboratories (ATL) for analysis under standard chain-of-custody (COC) documentation.

Laboratory analytical results are presented on Tables 2 through 5. Reproductions of the laboratory reports and chain-of-custody documentation are provided as Appendix A.

Predicted Soluble (Waste Extraction Test; WET) Lead Results

The lead data for the Site were treated as 16 separate sample populations for statistical evaluation. The waste classifications for each of the sample populations are provided in Tables 6a through 6p, and are summarized as follows:

Soil excavated to a depth of **2.0 feet** would be classified as California hazardous and will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous:

a) US 101 Northbound (NB) - Borings B-1 to B-67

b) US 101 NB excluding Willow Road Overcrossing (OC) and University Avenue OC - Borings B-1 to B-25, B-32 to B-42, and B-53 to B-67

c) US 101 NB excluding Willow Road OC - Borings B-1 to B-25 and B-32 to B-67

e) US 101 NB excluding University Avenue OC - Borings B-1 to B-42 and B-53 to B-67

f) US 101 NB at University Avenue OC - Borings B-43 to B-52

g) US 101 Southbound (SB) - Borings B-68 to B-137

h) US 101 SB excluding Willow Road OC and University Avenue OC - Borings B-68 to B-97, B-102 to B-111, and B-122 to B-137

i) US 101 SB excluding Willow Road OC - Borings B-68 to B-97 and B-102-B-137

k) US 101 SB excluding University Avenue OC - Borings B-68 to B-111 and B-122 to B-137

m) US 101 NB from Marsh Road to University Avenue – Borings B-1 to B-48

n) US 101 NB from University Avenue to Embarcadero Road – Borings B-49 to B-67

p) US 101 SB from University Avenue to Embarcadero Road – Borings B-117 to B-137

Soil excavated to a depth of **1.0 foot** would be classified as California hazardous and will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 1.0 foot) would be classified as non-hazardous:

d) US 101 NB at Willow Road OC - Borings B-26 to B-31

l) US 101 SB at University Avenue OC - Borings B-113 to B-121

Soil excavated to a depth of **2.5 feet** would be classified as California hazardous and will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.5 feet) would be classified as non-hazardous:

j) US 101 SB at Willow Road OC - Borings B-98- to B-101

o) US 101 SB from Marsh Road to University Avenue – Borings B-68 to B-116

CAM 17 Metals

The 95% UCL values for arsenic and vanadium in the soil samples collected at the Site are greater than their respective residential land use ESLs and are less than the commercial/industrial land use ESLs. The SFRWQCB *November 2007 Update to Environmental Screening Levels (ESLs) Technical Document* states that ambient background concentrations of arsenic typically exceed risk-based screening levels. In such instances, it may be more appropriate to compare site data to regionally specific established background levels.

The calculated 95% UCLs for antimony, cadmium, chromium, mercury and zinc are less than their respective ESLs. The 95% UCLs for these metals are all less than their respective published background mean concentrations, with the exception of antimony, which is within the published background range.

Offsite reuse or disposal of excavated soil may be restricted based on metals content.

Organics

Soil

TPHg and VOCs were not detected above the laboratory reporting limits. The reported TPHd and TPHmo concentrations were below their respective ESLs.

Grab-Groundwater

Organic compounds were not detected above their respective laboratory reporting limits in the grab-groundwater samples, with the exception of 4-isopropyltoluene, which does not have a published ESL value.

Worker Protection

Per Caltrans' requirements, the contractor(s) should prepare a project-specific health and safety plan to prevent or minimize worker exposure to impacted soil and groundwater. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of soil and groundwater.

1.0 INTRODUCTION

This Revised Preliminary Site Investigation Report for the United States Highway 101 (US 101) Auxiliary Lane Addition project was prepared by Geocon Consultants, Inc. under California Department of Transportation (Caltrans) Contract No. 04A2912 and Task Order (TO) 36, EA 04-235611.

Asbestos-containing materials (ACMs) surveys of the Ringwood pedestrian overcrossing (POC), the Hetch Hetchy Aqueduct Bridge, and the Francisquito Creek Bridge were also conducted under TO 36. The results of the ACM surveys are presented under separate cover in the *Asbestos and Lead-Containing Paint Survey Report,* dated December 2009.

1.1 Project Description and Proposed Improvements

The project area consists of US 101 from the intersection with Embarcadero Road in the City of Palo Alto to Marsh Road (the Site) in the City of Menlo Park, California. The Site extends between Post Miles (PM) 52.2 in Palo Alto, Santa Clara County, to PM 3.6 in Menlo Park, San Mateo County. Caltrans is proposing to add approximately four miles of auxiliary lane in both directions of US 101. The site location is depicted on the Vicinity Map, Figure 1.

1.2 General Objectives

The purpose of the investigation was to evaluate the concentrations of metals, including aerially deposited lead (ADL), in soil and total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) in soil and groundwater at the Site. The information obtained from this investigation will be used by Caltrans to determine soil disposal costs and to identify health and safety concerns during proposed construction activities.

2.0 BACKGROUND

2.1 Hazardous Waste Determination Criteria

Regulatory criteria to classify a waste as California hazardous for handling and disposal purposes are contained in the CCR, Title 22, Division 4.5, Chapter 11, Article 3, §66261.24. Criteria to classify a waste as Resource, Conservation, and Recovery Act (RCRA) hazardous are contained in Chapter 40 of the Code of Federal Regulations (40 CFR), Section 261.

For waste containing metals, the waste is classified as California hazardous when: 1) the total metal content exceeds the respective Total Threshold Limit Concentration (TTLC); or 2) the soluble metal content exceeds the respective Soluble Threshold Limit Concentration (STLC) based on the standard

Waste Extraction Test (WET). A waste has the potential of exceeding the STLC when the waste's total metal content is greater than or equal to ten times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to ten times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is required. A material is classified as RCRA hazardous, or Federal hazardous, when the soluble metal content exceeds the Federal regulatory level based on the Toxicity Characteristic Leaching Procedure (TCLP).

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability and corrosivity; however, for the purposes of this investigation, toxicity (i.e., lead concentrations) is the primary factor considered for waste classification since waste generated during the construction activities would not likely warrant testing for ignitability or other criteria. Waste that is classified as either California hazardous or RCRA hazardous requires management as a hazardous waste.

2.2 Environmental Screening Levels

The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) has prepared a technical report entitled *Screening For Environmental Concerns At Sites With Contaminated Soil and Groundwater, Interim Final* (May 2008), which presents Environmental Screening Levels (ESLs) for soil, groundwater, soil gas, and surface water, to assist in evaluating sites impacted by releases of hazardous chemicals. The ESLs are conservative values for more than 100 commonly detected contaminants, which may be used to compare with environmental data collected at a site. ESLs are strictly risk assessment tools and "not regulatory clean up standards." The presence of a chemical at concentrations in excess of an ESL does not necessarily indicate that adverse impacts to human health or the environment are occurring; this simply indicates that a potential for adverse risk may exist and that additional evaluation is or "may be" warranted (SFRWQCB, 2008).

The most conservative ESL tables were used for this characterization: Table A – Shallow Soil (≤3 meters below ground surface; bgs) – Groundwater is a Current or Potential Source of Drinking Water and Table K-2 – Direct Exposure Soil Screening Levels for Commercial / Industrial Worker Exposure Scenario. The respective ESLs are listed at the end of Tables 3 and 4 for comparative purposes.

3.0 SCOPE OF SERVICES

The scope of services requested by Caltrans under TO-36, EA 04-235611 included the following:

3.1 Pre-field Activities

- Prepared a *Workplan* dated June 25, 2009, that describes the requested scope of services and quality assurance/quality control (QA/QC) sampling and laboratory procedures.
- Prepared a site-specific health and safety plan to provide guidelines on the use of personal protective equipment and the health and safety procedures implemented during the field activities.
- Prepared a traffic control plan and obtained an encroachment permit from the City of Menlo Park Department of Public Works (a copy of the encroachment permit is provided in Appendix A).
- Obtained soil boring permit from the San Mateo County Health Services Division (a copy of the soil boring permit is provided in Appendix A).
- Retained the services of Caltrans-approved, California-licensed laboratories to perform the sample analyses.
- Retained the services of Caltrans-approved, utility location surveyor.
- Notified Underground Service Alert (USA) at least 48 hours prior to fieldwork involving drilling or direct-push sampling activities.
- Arranged traffic control on surface streets with D & M Traffic Services and along US 101 with Caltrans.

3.2 Field Activities

The field investigation was performed on August 10-13, 18, 24, 25, and 31, 2009, by Geocon staff John Love, Professional Geologist (PG), and Chris Merritt, PG. The following field activities were performed during the sampling efforts:

- Advanced a total of 136 soil borings at the Site to a maximum depth of 18 feet using direct-push drilling and hand-auger techniques. One-hundred-twenty-three borings were advanced to a depth of 2.5 feet, nine borings were advanced to a depth of 6 feet, and four borings were advanced to a depth of 18 feet.
- Collected a total of 438 soil samples. Selected soil samples were analyzed for total and soluble lead, California Assessment Manual (CAM) 17 metals, TPH and/or VOCs.
- Collected four grab-groundwater samples for analysis of TPH and VOCs.
- Transported samples to Advanced Technology Laboratories (ATL) for analysis under standard chain-of-custody (COC) documentation.

4.0 INVESTIGATIVE METHODS

4.1 Sampling Procedures

Soil samples were collected from 136 boring locations identified by the Caltrans TO Manager. Boring locations are shown on the Site Plans, Figure 2a-h, and were surveyed using Differential Global Positioning System (DGPS) equipment. Boring coordinates are presented on Table 1.
Soil samples were collected from the borings as follows:

- B-1 through B-111 and B-113 through B-137 (except for those borings listed below) at depth intervals of 0 to 0.5 foot, 1.0 to 1.5 feet, and 2.0 to 2.5 feet.
- B-7, B-60, B-73 through B-78 and B-131 at depth intervals of 0 to 0.5 foot, 1.0 to 1.5 feet, 2.0 to 2.5 feet, 4.0 to 4.5 feet and 6.0 to 6.5 feet.
- B17, B-19, B-84 and B-87 at depth intervals of 0 to 0.5 foot, 1.0 to 1.5 feet, 2.0 to 2.5 feet, 6.0 to 6.5 feet, 12 to 12.5 feet and 18 to 18.5 feet.

In addition, grab-groundwater samples were collected from borings B-17, B-19, B-75 and B-84.

Soil and groundwater samples were collected using a Geoprobe direct-push sample rig or a hand auger if access was limited. Soil samples collected using the Geoprobe direct-push rig were obtained by hydraulically advancing a three- to five-foot-long stainless steel core-barrel sampler lined with an acetate sample tube into undisturbed soil. Soil samples were collected for laboratory analysis by cutting an approximately 6-inch-long section of the acetate tube from the target sample depth, capping the ends with Teflon tape and plastic end caps, and then placing the sample tube in a chest cooled with ice for storage and delivery to the analytical laboratory. Soil samples collected using a hand-auger were placed in 8-ounce glass jars with threaded Teflon-lined plastic lids prior to being stored in a chest cooled with ice.

Grab-groundwater samples were collected by placing temporary PVC well casings into the open boreholes and then pumping groundwater through the well casing using ¼-inch-diameter disposable polyethylene tubing fitted with a check valve. Groundwater was discharged at ground surface into the appropriate sample containers where it was then placed in a chest cooled with ice for transport to the analytical laboratory.

Sample containers were labeled and transported to a Caltrans-approved, certified environmental laboratory using standard COC documentation. Shallow soil borings ($\leq$6 feet) were back-filled to surface with soil cuttings; borings advanced to groundwater were backfilled with neat cement grout.

Geocon and their subcontractors conducted QA/QC procedures during the field activities. These procedures included washing the sampling equipment with a Liqui-Nox® solution followed by a double rinse with deionized water. Decontamination water was disposed to the ground surface within Caltrans right-of-way in a manner not to create runoff, away from drain inlets or potential water bodies.

4.2 Laboratory Analyses

Laboratory analyses were performed by ATL under a standard seven-day turn-around-time. A CD containing the laboratory reports and COC documentation are presented as Appendix B.
Soil samples were analyzed as follows:

- Two-hundred-twenty-six samples for CAM 17 metals according to Title 22 CCR, Environmental Protection Agency (EPA) Test Methods 6010 ICAP and 7471A.
- Two-hundred-twelve samples for total lead using EPA Method 6010 ICAP.
- Per Caltrans request, 124 samples were further analyzed for WET lead using EPA Method 7420 and 45 samples were analyzed for TCLP lead using EPA Method 1445.
- Nine samples, which were collected from the 10 to 10.5-foot depth interval, for TPH as gasoline (TPHg), TPH as diesel (TPHd), and TPH as motor oil (TPHmo) using EPA Test Method 8015M.
- Nine samples for VOCs, including benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Test Method 8260B.
- Seventy-six soil samples for pH using EPA Method 9045.

The four grab-groundwater samples were analyzed for the following:

- TPHg, TPHd, and TPHmo using EPA Test Method 8015M.
- VOCs, including BTEX, using EPA Test Method 8260B.

4.3 Laboratory QA/QC

QA/QC procedures were performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. The laboratory QA/QC procedures included the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix; whichever was more frequent, with spike made at ten times the detection limit or at the analyte level.

Prior to submitting the samples to the laboratories, the COC documentation was reviewed for accuracy and completeness (Appendix B).

5.0 INVESTIGATIVE RESULTS

5.1 Subsurface Conditions

Near surface soils (0 to 2 feet) encountered along the US 101 corridor between Embarcadero Road in Palo Alto and Marsh Road in Menlo Park consisted primarily of dry to slightly moist intermixed sand, silt, and gravel with some clay being observed throughout the area. Soils deeper than two feet typically consisted of dark brown silty and sandy clay.

Groundwater was measured in borings B-17, B-19, and B-84 drilled near the Ringwood POC at depths ranging from 12.5 to 13.5 feet.

5.2 Laboratory Analytical Results

A summary of the analytical results for soil and grab-groundwater samples collected at the Site are presented in Tables 2 through 5. A CD containing the laboratory reports and chain-of-custody documentation are presented as Appendix B.

5.2.1 Soil

- The following CAM 17 metals were not detected above their respective laboratory reporting limits: beryllium, silver, and thallium.
- Remaining CAM 17 metals, with the exception of lead, were reported in the samples at concentrations less than ten times their respective STLCs.
- Total lead was reported at concentrations ranging from of 1.5 mg/kg to 5,300 mg/kg, with 30 samples equal to or exceeding the TTLC of 1,000 mg/kg.
- WET lead was reported as <0.25 mg/l in 2 of the 124 sampled analyzed. It was reported at concentrations ranging from 0.39 mg/l to 71 mg/l in the other 122 samples.
- TCLP lead was reported as <0.25 mg/l in 7 of the 45 samples analyzed. It was reported at concentrations ranging from 0.30 mg/l to 71 mg/l in the other 38 samples.
- TPHg was not detected above the laboratory reporting limit of 1.0 mg/kg in the samples.
- TPHd was reported at concentrations ranging from <1.0 to 5.8 mg/kg.
- TPHmo was reported in the samples at concentrations ranging from <1.0 to 13 mg/kg.
- VOCs, including BTEX, were not detected above their respective laboratory reporting limits.
- Soil pH values ranged from 7.0 to 8.7.

5.2.2 Grab-Groundwater

- TPHg, TPHd and TPHmo were not detected above their respective laboratory reporting limits.
- VOCs were not detected in the samples, with the exception of 4-isopropyltoluene at a concentration of 0.82 micrograms per liter (μg/l) in sample B-75.

5.3 Laboratory QA/QC

We reviewed the QA/QC results provided with the laboratory analytical reports. The data indicate non-detect results for the method blanks.

Matrix spike and/or matrix spike duplicates (MS/MSDs) were outside recovery criteria for several samples. The relative percent differences (RPDs) of the duplicate samples for several of the analyses were outside criteria. The RPDs for several of the MSDs for the analyses were outside criteria. Additionally, the surrogate recoveries were diluted out of two samples. However, the Case Narratives in the laboratory reports state that each analytical batch was validated by the laboratory control sample (LCS). The data showed acceptable recoveries and RPDs for the remainder of the duplicates and matrix spikes. Dilution was necessary for several analyses due to sample matrix.

Based on this limited data review, no additional qualifications of the soil data are necessary, and the data are of sufficient quality for the purposes of this report.

5.4 Statistical Evaluation for Lead Detected in Soil Samples

The lead data for the Site were treated as 16 separate sample populations for statistical evaluation, which consisted of the following:

a) US 101 Northbound (NB) - Borings B-1 to B-67

b) US 101 NB excluding Willow Road Overcrossing (OC) and University Avenue OC - Borings B-1 to B-25, B-32 to B-42, and B-53 to B-67

c) US 101 NB excluding Willow Road OC - Borings B-1 to B-25 and B-32 to B-67

d) US 101 NB at Willow Road OC - Borings B-26 to B-31

e) US 101 NB excluding University Avenue OC - Borings B-1 to B-42 and B-53 to B-67

f) US 101 NB at University Avenue OC - Borings B-43 to B-52

g) US 101 Southbound (SB) - Borings B-68 to B-137

h) US 101 SB excluding Willow Road OC and University Avenue OC - Borings B-68 to B-97, B-102 to B-111, and B-122 to B-137

i) US 101 SB excluding Willow Road OC - Borings B-68 to B-97 and B-102-B-137

j) US 101 SB at Willow Road OC - Borings B-98- to B-101

k) US 101 SB excluding University Avenue OC - Borings B-68 to B-111 and B-122 to B-137

l) US 101 SB at University Avenue OC - Borings B-113 to B-121

m) US 101 NB from Marsh Road to University Avenue – Borings B-1 to B-48

n) US 101 NB from University Avenue to Embarcadero Road – Borings B-49 to B-67

o) US 101 SB from Marsh Road to University Avenue – Borings B-68 to B-116

p) US 101 SB from University Avenue to Embarcadero Road – Borings B-117 to B-137

Statistical methods were applied to the total lead data to evaluate: 1) the upper confidence limits (UCLs) of the arithmetic means of the total lead concentrations for each sampling depth; and 2) if an acceptable correlation between total and WET lead concentrations exists that would allow the prediction of WET lead concentrations based on calculated UCLs. The statistical methods used are discussed in a book entitled *Statistical Methods for Environmental Pollution Monitoring,* by Richard Gilbert; in an EPA *Technology Support Center Issue* document entitled, *The Lognormal Distribution in Environmental Applications,* by Ashok Singh et. al., dated December 1997; and in a book entitled *An Introduction to the Bootstrap,* by Bradley Efron and Robert J. Tibshirani.

5.4.1 Calculating the UCLs for the Arithmetic Mean

The upper one-sided 90% and 95% UCLs of the arithmetic mean are defined as the values that, when calculated repeatedly for randomly drawn subsets of site data, equal or exceed the true mean 90% and 95% of the time, respectively. Statistical confidence limits are the classical tool for addressing uncertainties of a distribution mean. The UCLs of the arithmetic mean concentration are used as the mean concentrations because it is not possible to know the true mean due to the essentially infinite number of soil samples that could be collected from a site. The UCLs therefore account for uncertainties due to limited sampling data. As data become less limited at a site, uncertainties decrease, and the UCLs move closer to the true mean.

Non-parametric bootstrap techniques used to calculate the UCLs are discussed in the previously referenced EPA document and in *An Introduction to the Bootstrap.* For those samples in which total lead was not detected at concentrations exceeding the laboratory reporting limit, a value equal to one-half of the detection limit was used in the UCL calculation. The bootstrap test results are included in Appendix C.

The following tables present the calculated UCLs and statistics for each data set.

US 101 NB
Borings B-1 to B-67

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	551.7	588.5	411.5	2.5	5,300
1.0 to 1.5	372.3	398.2	275.5	2.5	4,100
2.0 to 2.5	62.9	69.7	43.8	1.0	830

US 101 NB excluding Willow Road OC and University Avenue OC
Borings B-1 to B-25, B-32 to B-42, and B-53 to B-67

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	329.3	349.9	257.3	2.5	2,000
1.0 to 1.5	431.3	468.1	312.7	2.5	4,100
2.0 to 2.5	79.2	85.8	53.5	2.5	830

US 101 NB excluding Willow Road OC
Borings B-1 to B-25 and B-32 to B-67

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	431.8	463.9	322.3	2.5	4,600
1.0 to 1.5	394.5	423.6	294.6	2.5	4,100
2.0 to 2.5	68.3	72.9	46.5	1.0	830

US 101 NB at Willow Road OC
Borings B-26 to B-31

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	2,274	2,547	1,318	100	5,300
1.0 to 1.5	108.8	116.3	81.8	15	150
2.0 to 2.5	23.0	24.6	16.6	2.5	35

US 101 NB excluding University Avenue OC
Borings B-1 to B-42 and B-53 to B-67

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	502	536.6	369	2.5	5,300
1.0 to 1.5	392.3	426.8	288.4	2.5	4,100
2.0 to 2.5	72.2	78.8	49.6	2.5	830

US 101 NB at University Avenue OC
Borings B-43 to B-52

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	1,202	1,374	653.7	17	4,600
1.0 to 1.5	346.1	382.4	201.9	8.0	1,200
2.0 to 2.5	16.2	18.0	10.9	1.0	49

US 101 SB
Borings B-68 to B-137

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	649.7	683.5	525.7	2.5	5,300
1.0 to 1.5	227.1	240.9	182.7	1.5	1,300
2.0 to 2.5	70.8	78.2	41.5	2.4	1,900

US 101 SB excluding Willow Road OC and University Avenue OC
Borings B-68 to B-97, B-102 to B-111, and B-122 to B-137

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	585.4	615.2	485.6	2.5	2,700
1.0 to 1.5	242.1	258.8	192.1	1.5	1,300
2.0 to 2.5	87.3	101.1	44.4	2.4	1,900

US 101 SB excluding Willow Road
Borings B-68 to B-97 and B-102 to B-137

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	549.9	577	460	2.5	2,700
1.0 to 1.5	219.5	231.8	171.9	1.5	1,300
2.0 to 2.5	76.3	86.6	39.3	2.4	1,900

US 101 SB at Willow Road OC
Borings B-98 to B-101

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	Not Calculated	Not Calculated	1,594	27	5,300
1.0 to 1.5	Not Calculated	Not Calculated	357	65	790
2.0 to 2.5	Not Calculated	Not Calculated	260.8	15	820

US 101 SB excluding University Avenue OC
Borings B-68 to B-111 and B-122 to B-137

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	699.6	742.7	559.5	2.5	5,300
1.0 to 1.5	256.3	267	203.1	1.5	1,300
2.0 to 2.5	101	114.5	58.8	2.4	1,900

US 101 SB at University Avenue OC
Borings B-113 to B-121

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	496.1	547.6	300.3	21	1,500
1.0 to 1.5	62.3	66.7	46.6	8.5	100
2.0 to 2.5	9.0	9.3	7.6	2.5	14

US 101 NB from Marsh Road to University Avenue
Borings B-1 to B-48

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	626.8	667.1	441.9	2.5	5,300
1.0 to 1.5	257.1	275.3	197	2.5	1,400
2.0 to 2.5	57.5	62.0	39.9	2.5	560

US 101 NB from University Avenue to Embarcadero Road
Borings B-49 to B-67

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	492.6	538	334.6	19	2,000
1.0 to 1.5	760.3	839.5	473.8	5.3	4,100
2.0 to 2.5	106	122.7	53.8	1.0	830

US 101 SB from Marsh Road to University Avenue
Borings B-68 to B-116

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	705.3	753	547.2	2.5	5,300
1.0 to 1.5	236.3	252	182	1.5	1,300
2.0 to 2.5	123.8	139.1	70.4	2.4	1,900

US 101 SB from University Avenue to Embarcadero Road
Borings B-117 to B-137

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0.0 to 0.5	648.1	690.9	476.6	12	1,900
1.0 to 1.5	264.8	287.7	184.1	2.5	1,200
2.0 to 2.5	11.8	12.3	10.3	2.5	20

5.4.2 Correlation of Total and WET Lead

Total and corresponding WET lead concentrations are bivariate data with a linear structure. This linear structure should allow for the prediction of WET lead concentrations based on the UCLs calculated above in Section 5.4.1.

To estimate the degree of interrelation between total and corresponding WET lead values (*x* and *y*, respectively), the *correlation coefficient [r]* is used. The correlation coefficient is a ratio that ranges from +1 to –1. A *correlation coefficient* of +1 indicates a perfect direct relationship between two variables; a *correlation coefficient* of –1 indicates that one variable changes inversely with relation to the other. Between the two extremes is a spectrum of less-than-perfect relationships, including zero, which indicates the lack of any sort of linear relationship at all. The *correlation coefficient* was calculated for the 124 (*x, y*) data points (i.e., soil samples analyzed for both total lead [*x*] and WET lead [*y*]). To achieve an acceptable correlation, the 15 data points with the highest squared residual WET lead concentrations were eliminated from the regression analysis. The resulting *coefficient of determination* (r^2) equaled 0.6573, which yields a corresponding *correlation coefficient* (*r*) of 0.81.

For the *correlation coefficient* that indicates a linear relationship between total and WET lead concentrations, it is possible to compute the line of dependence or a best-fit line between the two variables. A least squares method was used to find the equation of a best-fit line (regression line) by forcing the y-intercept equal to zero since that is a known point. The equation of the regression line was determined to be $y = 0.046(x)$, where *x* represents total lead concentrations and *y* represents predicted WET lead concentrations.

This equation was used to estimate the expected WET lead concentrations for the UCLs calculated in for samples collected from the Site (see Section 5.4.1). Regression analysis results and a scatter plot depicting the (*x, y*) data points along with the regression line are included in Appendix C. The predicted WET lead concentrations are summarized in Tables 6a to 6p.

6.0 CONCLUSIONS

Waste classifications are evaluated based on the 90% UCL of the lead content for the relevant excavation depths; this has historically been considered sufficient to satisfy a good faith effort by the EPA as discussed in SW-846. Risk assessment characterization is based on the 95% UCL of the lead content in the waste for the relevant depths; this is in accordance with the Risk Assessment Guidance for Superfund (RAGS) Volume 1 Documentation for Exposure Assessment. Per Caltrans, the 90% UCLs are to be used to evaluate onsite reuse and the 95% UCLs are to be used to evaluate offsite disposal.

6.1 Predicted WET Lead Results

6.1.1 US 101 NB

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. Weighted averages are calculated by using the total lead concentration for each 0.5-foot depth interval as the value for the underlying 0.5-foot depth interval (unless a sample was collected from the underlying depth interval). The total and WET lead calculations are summarized in Table 6a.

Excavation Depth	**90% UCL Total Lead (mg/kg)**	**90% UCL Predicted WET Lead (mg/l)**	**95% UCL Total Lead (mg/kg)**	**Waste Classification**
0 to 1.0 foot	552	**25**	589	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*269*	***12***	*289*	***Hazardous***
0 to 2.0 feet	462	**21**	493	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*63*	*2.9*	*70*	*Non-Hazardous*
0 to 2.5 feet	*382*	***18***	*409*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.2 US 101 NB excluding Willow Road OC and University Avenue OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6b.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	329	**15**	350	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*314*	***14***	*341*	***Hazardous***
0 to 2.0 feet	380	**17**	409	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*79*	*3.6*	*86*	*Non-Hazardous*
0 to 2.5 feet	*320*	***15***	*344*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.3 US 101 NB excluding Willow Road OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6c.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	432	**20**	464	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*286*	***13***	*307*	***Hazardous***
0 to 2.0 feet	413	**19**	444	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*68*	*3.1*	*73*	*Non-Hazardous*
0 to 2.5 feet	*344*	***16***	*370*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.4 US 101 NB at Willow Road OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6d.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	2,274	**105**	2,547	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*80*	*3.7*	*86*	*Non-Hazardous*
0 to 2.0 feet	1,191	**55**	1,332	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*23*	*1.1*	*25*	*Non-Hazardous*
0 to 2.5 feet	*958*	***44***	*1,070*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 1.0 foot would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 1.0 foot will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 1.0 foot) would be classified as non-hazardous.

6.1.5 US 101 NB excluding University Avenue OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6e.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	502	**23**	537	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*286*	***13***	*311*	***Hazardous***
0 to 2.0 feet	447	**21**	482	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*72*	*3.3*	*79*	*Non-Hazardous*
0 to 2.5 feet	*372*	*17*	*401*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.6 US 101 NB at University Avenue OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6f.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	1,202	**55**	1,374	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*236*	***11***	*261*	***Hazardous***
0 to 2.0 feet	774	**36**	878	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*16*	*0.74*	*18*	*Non-Hazardous*
0 to 2.5 feet	*622*	***29***	*706*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.7 US 101 SB

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6g.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	650	**30**	684	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*175*	***8.0***	*187*	***Hazardous***
0 to 2.0 feet	438	**20**	462	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*71*	*3.3*	*78*	*Non-Hazardous*
0 to 2.5 feet	*365*	*17*	*385*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.8 US 101 SB excluding Willow Road OC and University Avenue OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6h.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	585	**27**	615	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*191*	***8.8***	*206*	***Hazardous***
0 to 2.0 feet	414	**19**	437	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*87*	*4.0*	*101*	*Non-Hazardous*
0 to 2.5 feet	*348*	***16***	*370*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.9 US 101 SB excluding Willow Road OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6i.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	550	**25**	577	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*172*	***7.9***	*183*	***Hazardous***
0 to 2.0 feet	385	**18**	404	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*76*	*3.5*	*87*	*Non-Hazardous*
0 to 2.5 feet	*323*	***15***	*341*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.10 US 101 SB at Willow Road OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the maximum total lead concentrations and the relationship between total and WET lead for data collected at the Site. Maximum concentrations were conservatively used because UCLs cannot be calculated for a data set that consists of less than four unique values. The total and WET lead calculations are summarized in Table 6j.

Excavation Depth	Maximum Total Lead (mg/kg)	Predicted WET Lead (mg/l)	Waste Classification
0 to 1.0 foot	5,300	**244**	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*800*	*37*	***Hazardous***
0 to 2.0 feet	3,045	**140**	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*820*	***38***	***Hazardous***
0 to 2.5 feet	*2,600*	***120***	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.5 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.5 feet will require disposal at a Class I landfill facility.

6.1.11 US 101 SB excluding University Avenue OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6k.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	700	**32**	743	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*205*	***9.4***	*216*	***Hazardous***
0 to 2.0 feet	478	**22**	505	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*101*	*4.6*	*115*	*Non-Hazardous*
0 to 2.5 feet	*403*	***19***	*427*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.12 US 101 SB at University Avenue OC

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6l.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	496	**23**	**548**	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*45*	*2.0*	*48*	*Non-Hazardous*
0 to 2.0 feet	279	**13**	**307**	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*9.0*	*0.41*	*9.3*	*Non-Hazardous*
0 to 2.5 feet	*225*	***10***	*248*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 1.0 foot would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 1.0 foot will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 1.0 foot) would be classified as non-hazardous.

6.1.13 US 101 NB from Marsh Road to University Avenue

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6m.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	627	**29**	667	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*191*	***8.8***	*204*	***Hazardous***
0 to 2.0 feet	442	**20**	471	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*57*	*2.6*	*62*	*Non-Hazardous*
0 to 2.5 feet	*365*	*17*	*389*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.14 US 101 NB from University Avenue to Embarcadero Road

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6n.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	493	**23**	538	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*542*	***25***	*601*	***Hazardous***
0 to 2.0 feet	626	**29**	689	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*106*	*4.9*	*123*	*Non-Hazardous*
0 to 2.5 feet	*522*	***24***	*576*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.1.15 US 101 SB from Marsh Road to University Avenue

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6o.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	705	**32**	753	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*199*	***9.1***	*214*	***Hazardous***
0 to 2.0 feet	471	**22**	503	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*124*	***5.7***	*139*	***Hazardous***
0 to 2.5 feet	*401*	***18***	*430*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.5 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.5 feet will require disposal at a Class I landfill facility.

6.1.16 US 101 SB from University Avenue to Embarcadero Road

The following table summarizes the predicted WET lead concentrations and the waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and the relationship between total and WET lead for data collected at the Site. The total and WET lead calculations are summarized in Table 6p.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1.0 foot	648	**30**	691	**Hazardous**
Underlying soil (1.0 to 2.5 ft)	*180*	***8.3***	*196*	***Hazardous***
0 to 2.0 feet	456	**21**	489	**Hazardous**
Underlying Soil (2.0 to 2.5 ft)	*12*	*0.54*	*12*	*Non-Hazardous*
0 to 2.5 feet	*368*	***17***	*394*	**Hazardous**

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data in the above table, soil excavated from the surface to a depth of 2.0 feet would be classified as a California hazardous waste since the 90% UCL-predicted WET lead concentrations are greater than the lead STLC of 5.0 mg/l. Based on the TCLP lead results excavated soil would not be considered a RCRA hazardous waste. Soil excavated to a depth of 2.0 feet will require disposal at a Class I landfill facility. Underlying soil (i.e., deeper than 2.0 feet) would be classified as non-hazardous.

6.2 CAM 17 Metals

The CAM 17 metals concentrations in site soil were compared to ESLs (Table A, SFRWQCB, May 2008). The following metals were reported at concentrations greater than their respective ESL values in the soil samples collected at the Site: antimony, arsenic, cadmium, chromium, mercury, vanadium, and zinc. Arsenic and zinc were reported at concentrations exceeding their respective residential and commercial/industrial land use ESLs for shallow soil (≤3 meters; SFRWQCB, Table A). Antimony, cadmium, mercury, and vanadium were reported at concentrations exceeding their respective residential land use ESLs for shallow soil.

Upper one-sided 95% UCLs were calculated for the full set of metals concentrations with reported exceedances of ESLs. The 95% UCLs were compared with ESLs and with published background levels typically present in California soils as presented in *Background Concentrations of Trace and Major Elements in California Soils* (Kearney Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California, March 1996). The bootstrap results are included in Appendix C. The calculated standard bootstrap UCLs, ESLs and published background concentrations are summarized in the table below:

95% UCLs, ESLs and Published Background Concentrations for Selected Metals

Metal	95% UCL	Shallow Soil Residential ESL	Shallow Soil Commercial/ Industrial ESL	Direct Exposure Construction Worker ESL	PUBLISHED BACKGROUND MEAN[1]	PUBLISHED BACKGROUND RANGE [1]
Antimony	1.9	6.3	40	310	0.60	0.15 to 1.95
Arsenic	1.4	0.39	1.6	15	3.5	0.6 to 11.0
Cadmium	1.2	1.7	7.4	39	0.36	0.05 to1.70
Chromium*	46.3	750	750	1,200,000	122	23 to 1,579
Mercury	0.10	1.3	10	58	0.26	0.05 to 0.90
Vanadium	53.8	16	200	770	112	39 to 288
Zinc	151.8	600	600	230,000	149	88 to 236

Concentrations reported in milligrams per kilogram (mg/kg)

[1] Kearney Foundation of Soil Science, March 1996

* = Value is for Chromium III, no standard for total chromium.

The 95% UCL values for arsenic and vanadium in the soil samples collected at the Site are greater than their respective residential land use ESLs and are less than the commercial/industrial land use ESLs. The SFRWQCB *November 2007 Update to Environmental Screening Levels (ESLs) Technical Document* states that ambient background concentrations of arsenic typically exceed risk-based screening levels. In such instances, it may be more appropriate to compare site data to regionally specific established background levels.

The calculated 95% UCLs for antimony, cadmium, chromium, mercury and zinc are less than their respective ESLs. The 95% UCLs for these metals are all less than their respective published background mean concentrations, with the exception of antimony, which is within the published background range.

Offsite reuse or disposal of excavated soil may be restricted based on metals content.

6.3 Organics

6.3.1 Soil

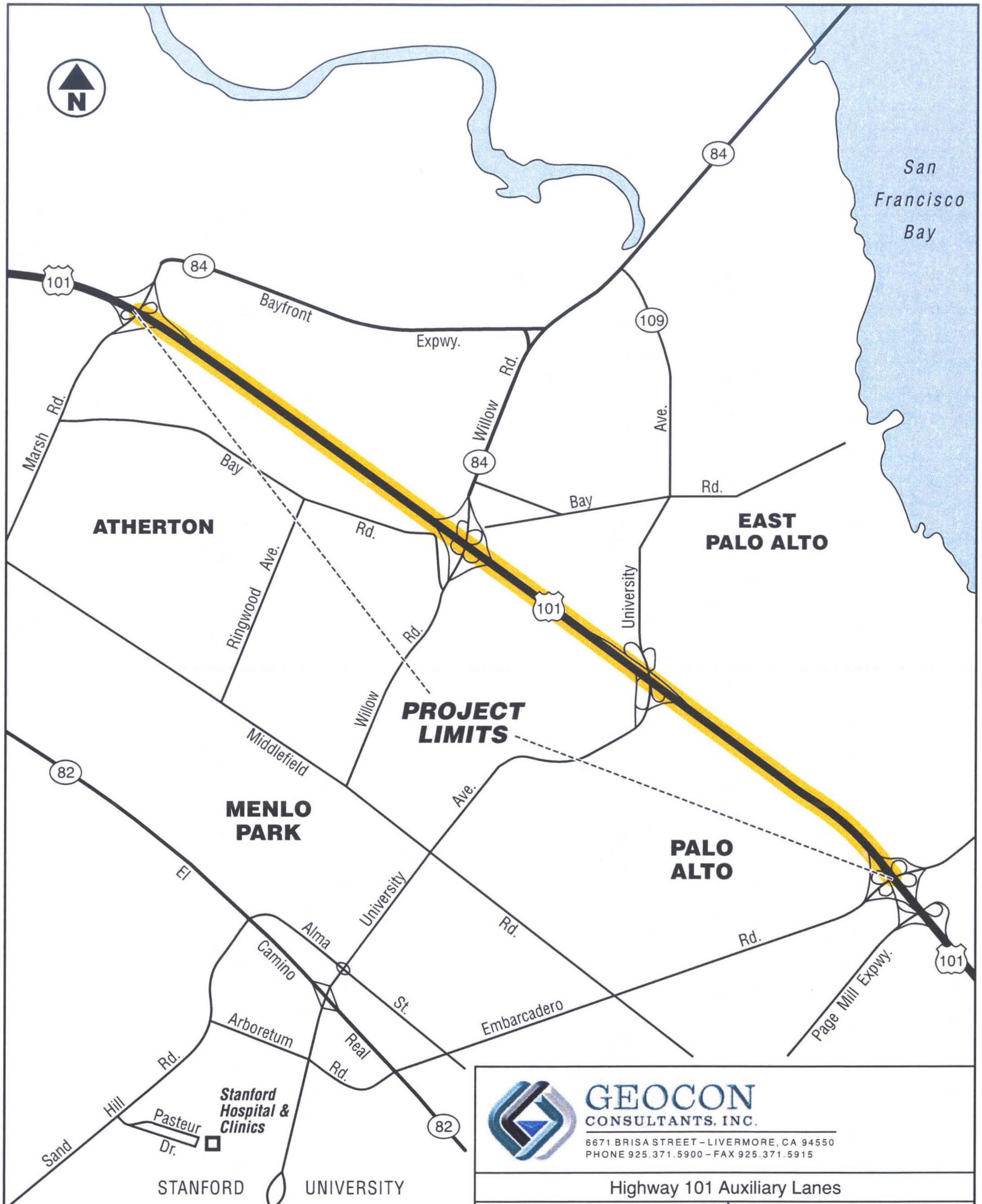
TPHg and VOCs were not detected above the laboratory reporting limits. The reported TPHd and TPHmo concentrations were below their respective ESLs.

6.3.2 Grab-Groundwater

Organic compounds were not detected above their respective laboratory reporting limits in the grab-groundwater samples, with the exception of 4-isopropyltoluene, which does not have a published ESL value.

6.4 Worker Protection

Per Caltrans' requirements, the contractor(s) should prepare a project-specific health and safety plan to prevent or minimize worker exposure to impacted soil and groundwater. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of soil and groundwater.



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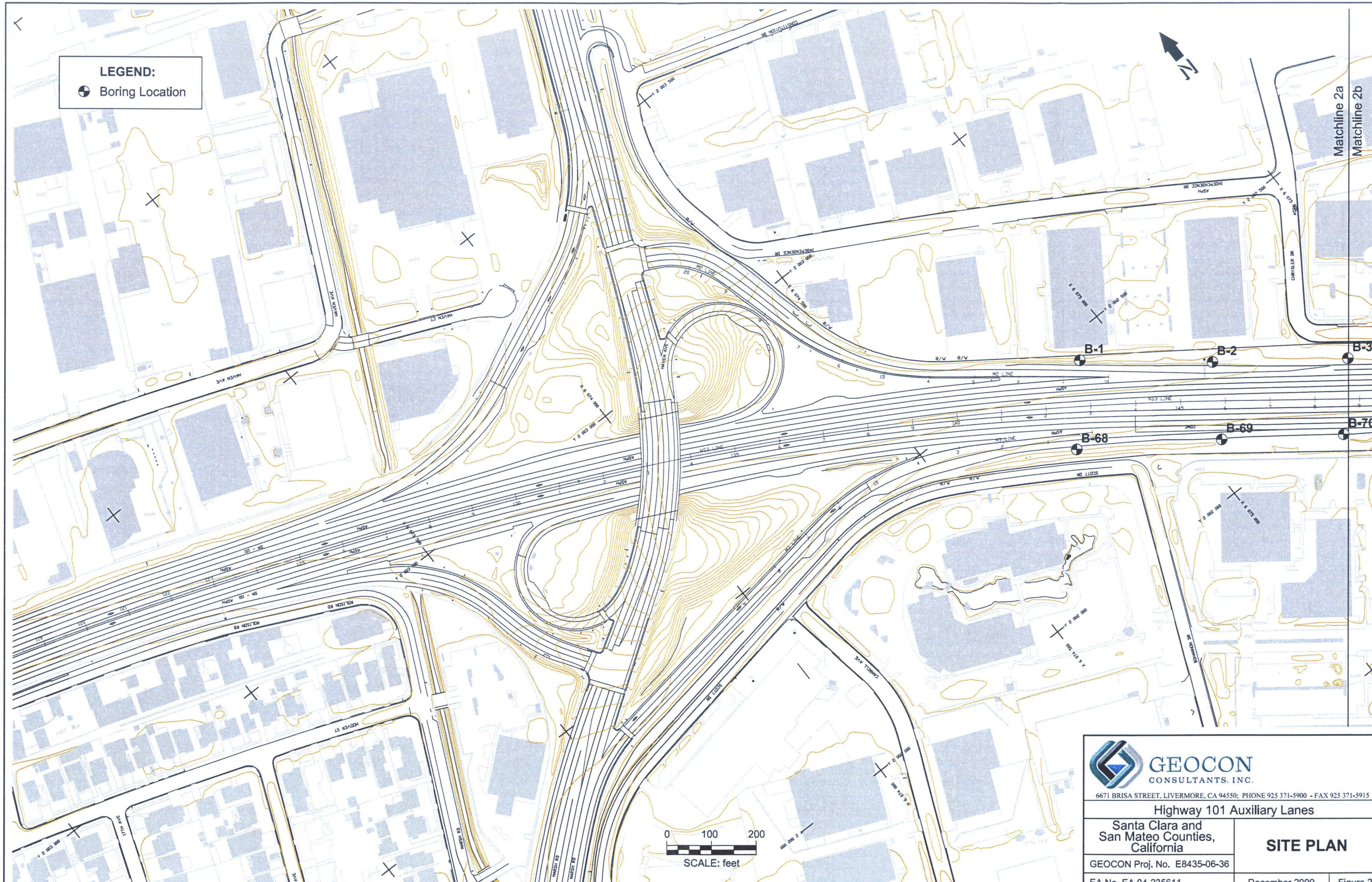
Highway 101 Auxiliary Lanes		
Santa Clara & San Mateo Counties, California	**VICINITY MAP**	
GEOCON Proj. No. E8435-06-36		
Task Order No. 36, EA 04-235611	December 2009	Figure 1



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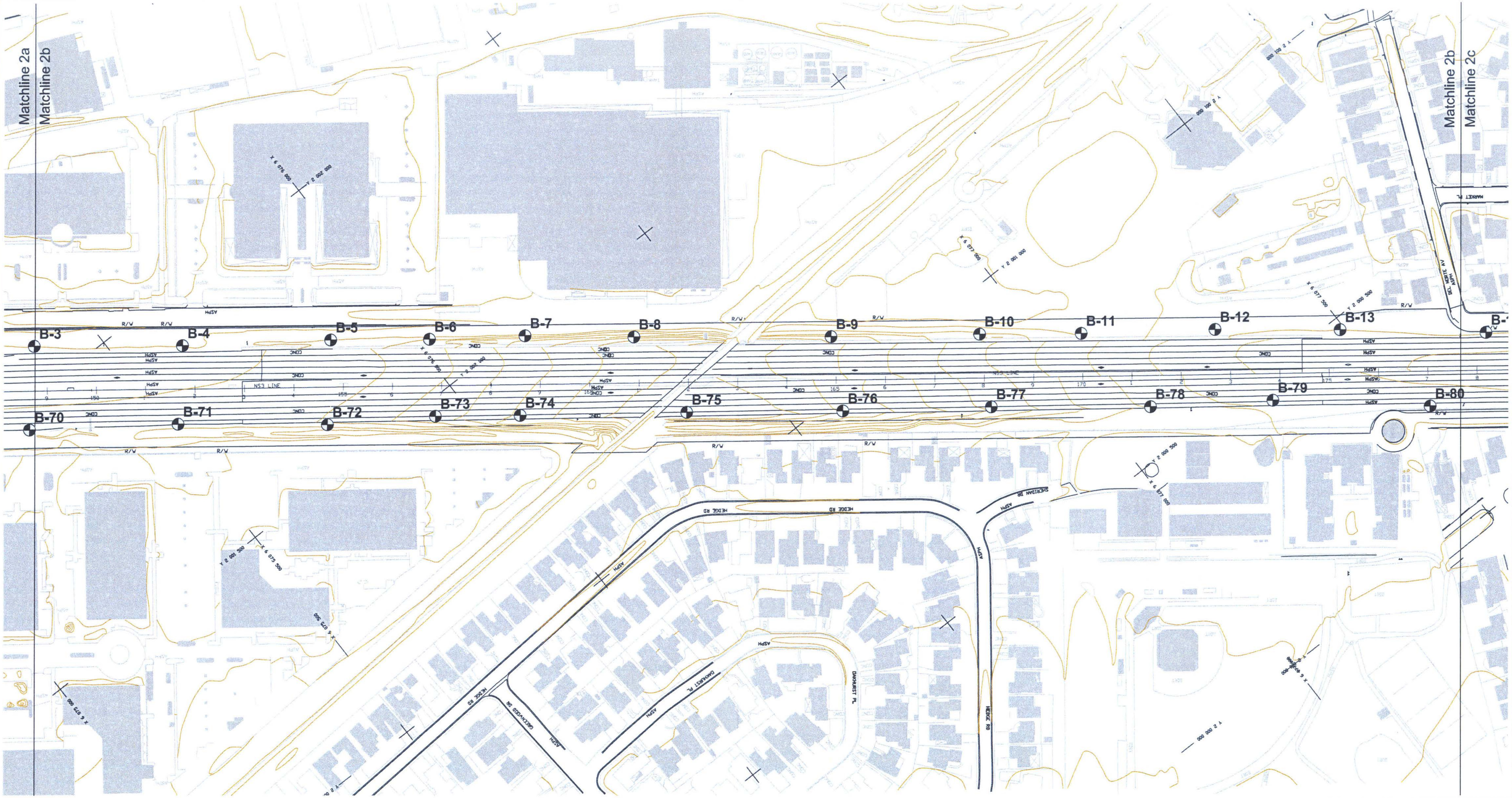
Highway 101 Auxiliary Lanes		
Santa Clara and San Mateo Counties, California	SITE PLAN	
GEOCON Proj. No. E8435-06-36		
EA No. EA 04-235611	December 2009	Figure 2a

SITE0110



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Boring Location

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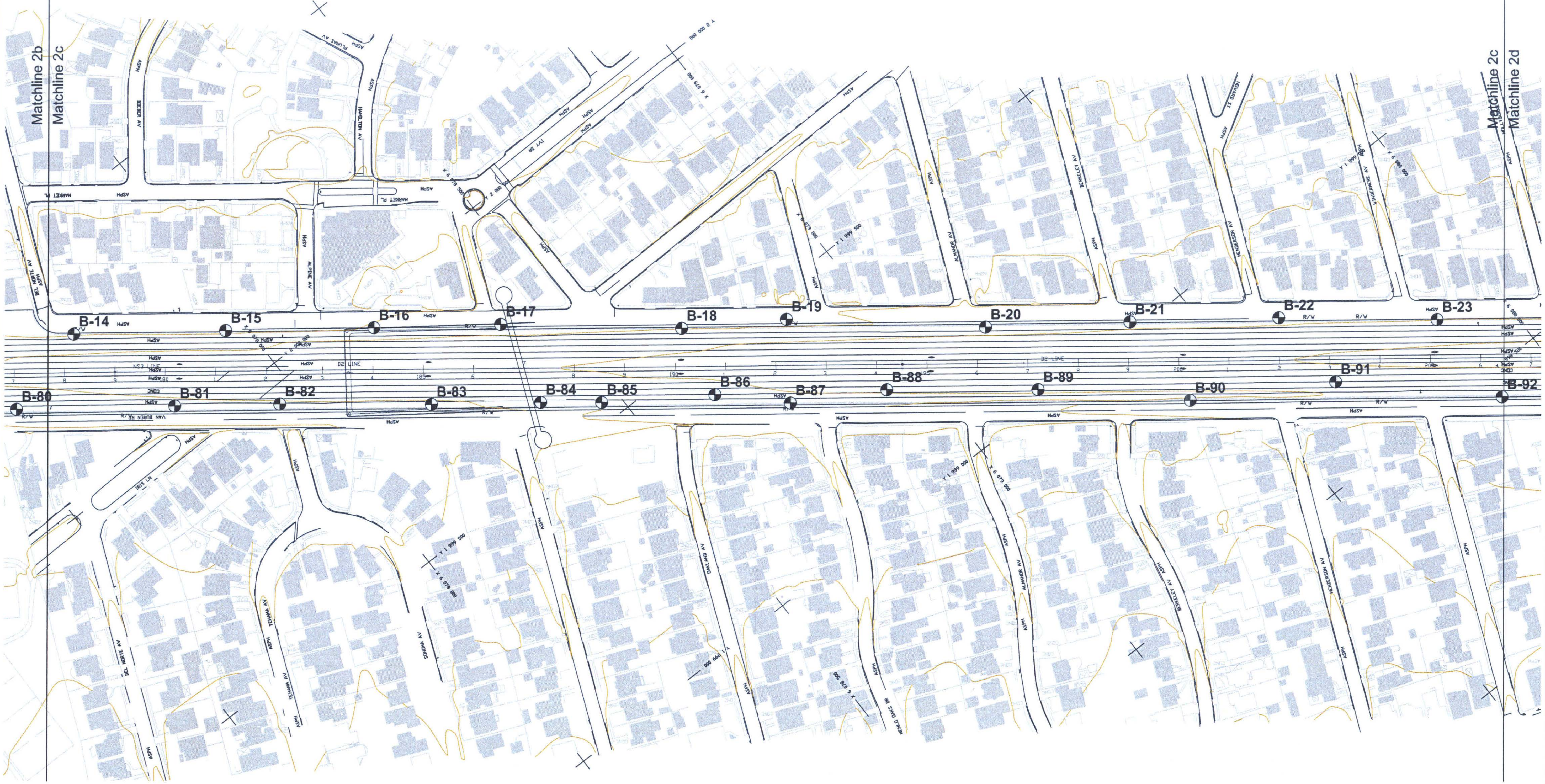
Highway 101 Auxiliary Lanes		
Santa Clara and San Mateo Counties, California	SITE PLAN	
GEOCON Proj. No. E8435-06-36		
EA No. EA 04-235611	December 2009	Figure 2b

SITE0110



LEGEND:

Boring Location

N

0 100 200

SCALE: feet

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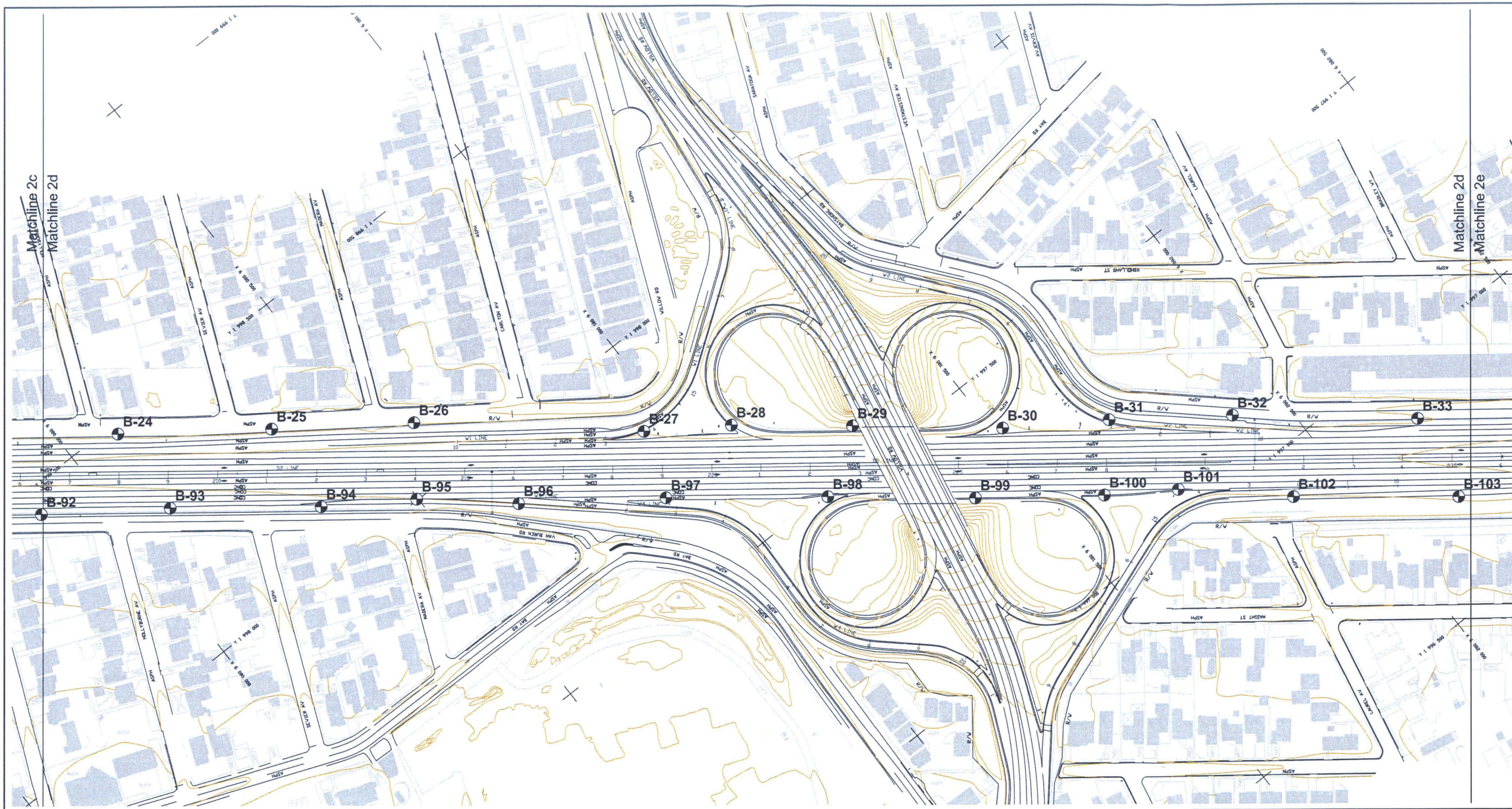
Highway 101 Auxiliary Lanes

Santa Clara and San Mateo Counties, California	SITE PLAN
GEOCON Proj. No. E8435-06-36	
EA No. EA 04-235611	December 2009 / Figure 2c

SITE0110



LEGEND:
Boring Location

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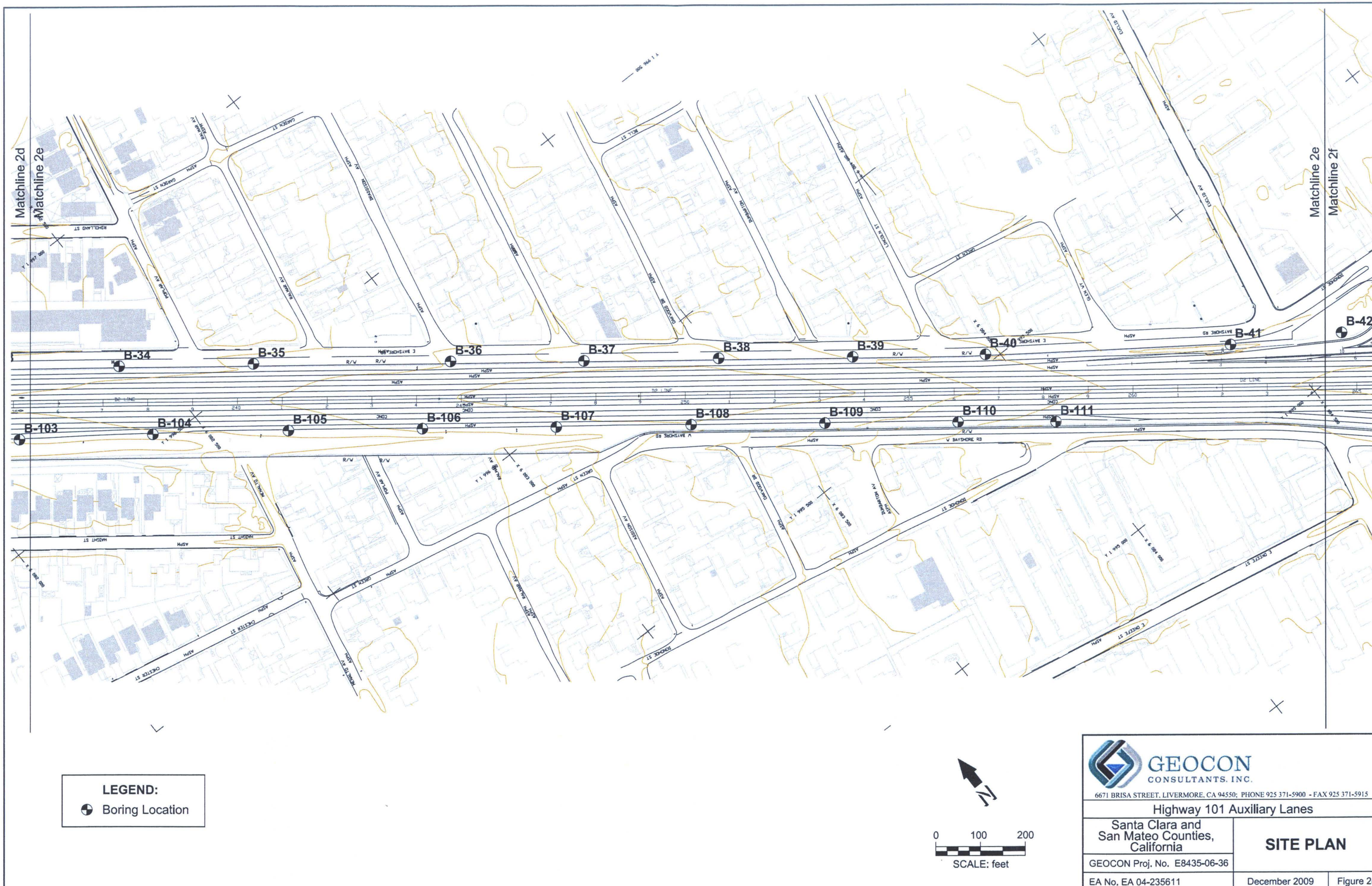
Highway 101 Auxiliary Lanes		
Santa Clara and San Mateo Counties, California	SITE PLAN	
GEOCON Proj. No. E8435-06-36		
EA No. EA 04-235611	December 2009	Figure 2d

SITE0110



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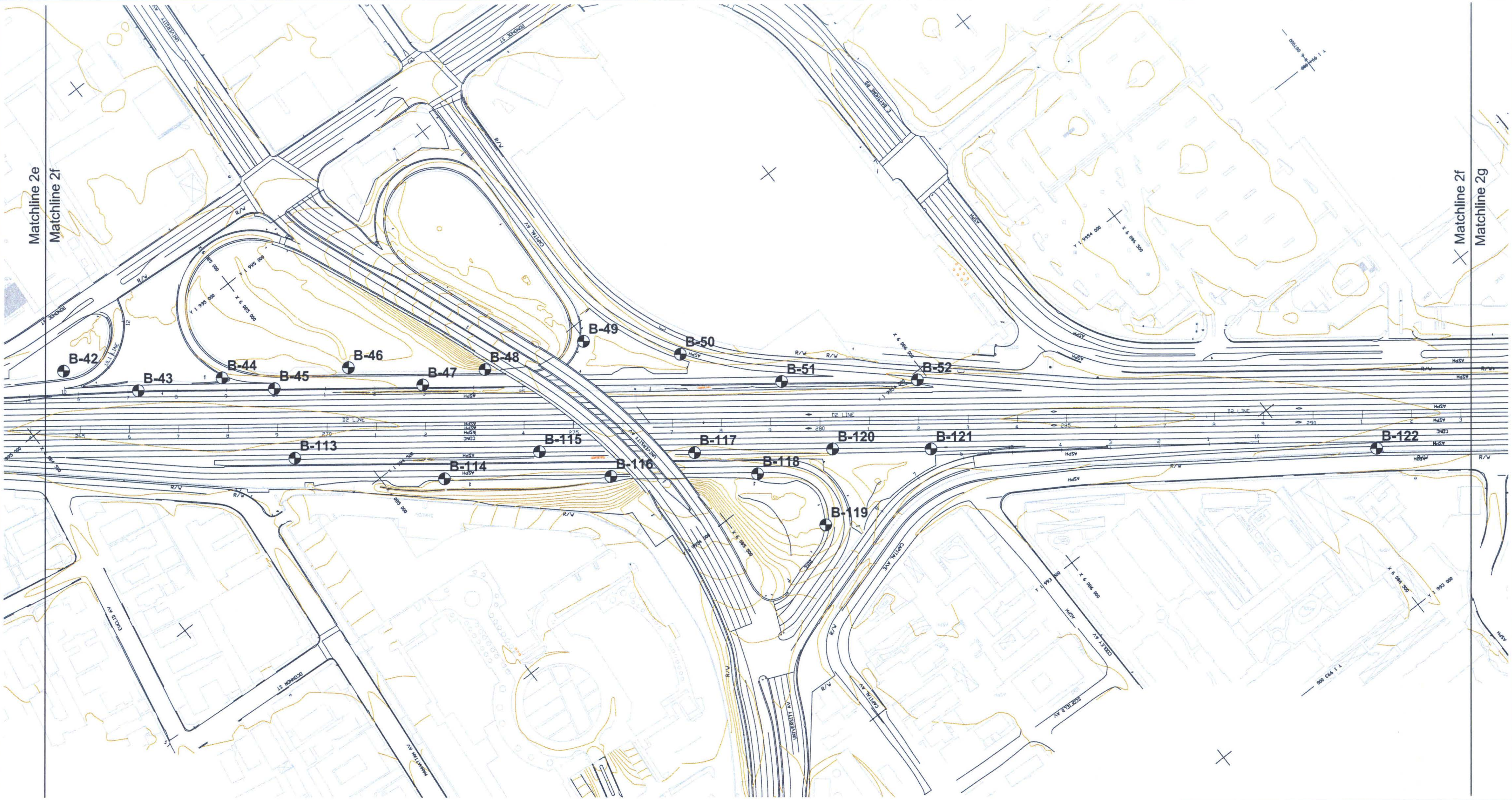
Highway 101 Auxiliary Lanes

Santa Clara and San Mateo Counties, California	SITE PLAN
GEOCON Proj. No. E8435-06-36	
EA No. EA 04-235611	December 2009 / Figure 2e

SITE0110



LEGEND:

Boring Location

0 100 200

SCALE: feet

N

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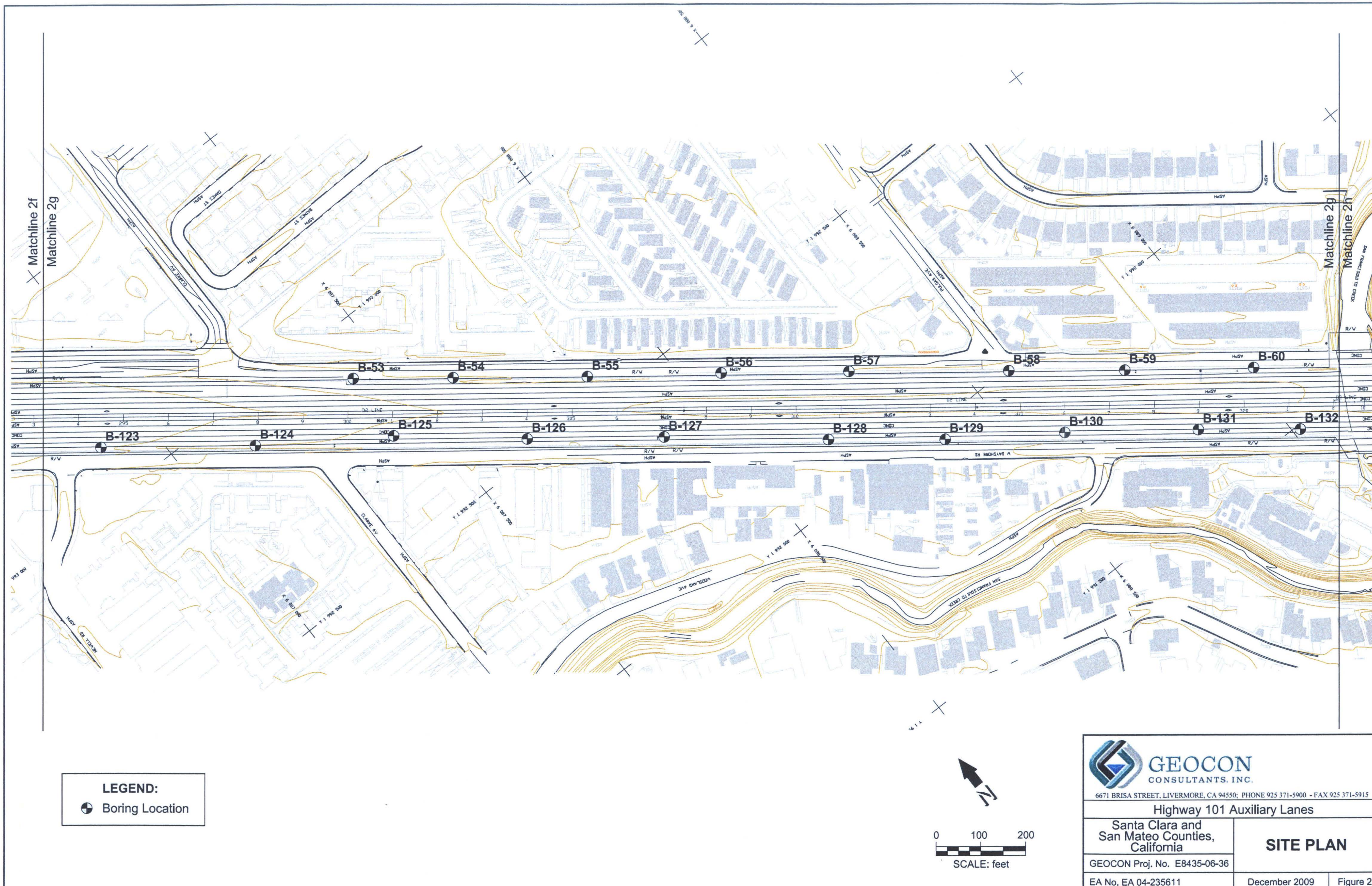
Highway 101 Auxiliary Lanes	
Santa Clara and San Mateo Counties, California	**SITE PLAN**
GEOCON Proj. No. E8435-06-36	
EA No. EA 04-235611	December 2009 — Figure 2f

SITE0110



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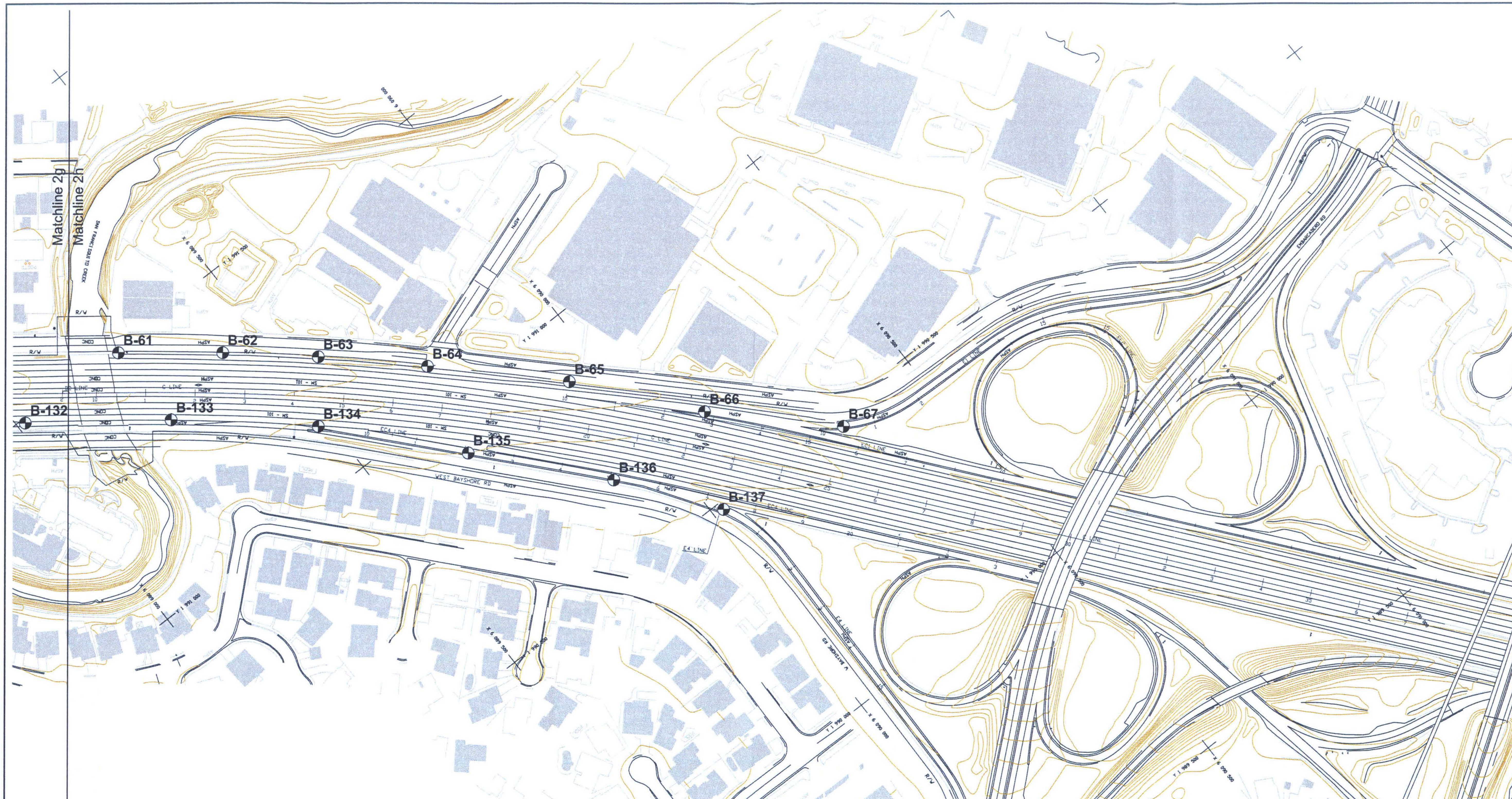
Highway 101 Auxiliary Lanes		
Santa Clara and San Mateo Counties, California	SITE PLAN	
GEOCON Proj. No. E8435-06-36		
EA No. EA 04-235611	December 2009	Figure 2g

SITE0110



LEGEND:

Boring Location

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Highway 101 Auxiliary Lanes		
Santa Clara and San Mateo Counties, California	SITE PLAN	
GEOCON Proj. No. E8435-06-36		
EA No. EA 04-235611	December 2009	Figure 2h

SITE0110

TABLE 1
Boring Coordinates
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Boring	Northing	Easting
B-1	2,002,446.309	6,074,910.656
B-2	2,002,260.699	6,075,141.045
B-3	2,002,081.012	6,075,384.226
B-4	2,001,896.906	6,075,622.235
B-5	2,001,721.634	6,075,865.281
B-6	2,001,599.343	6,076,024.775
B-7	2,001,485.651	6,076,181.794
B-8	2,001,348.256	6,076,353.959
B-9	2,001,101.857	6,076,669.769
B-10	2,000,920.889	6,076,909.823
B-11	2,000,795.027	6,077,073.107
B-12	2,000,633.868	6,077,292.202
B-13	2,000,476.731	6,077,491.387
B-14	2,000,289.795	6,077,721.038
B-15	2,000,110.089	6,077,963.512
B-16	1,999,933.837	6,078,198.398
B-17	1,999,784.338	6,078,401.617
B-18	1,999,557.533	6,078,679.334
B-19	1,999,443.181	6,078,854.631
B-20	1,999,188.014	6,079,156.451
B-21	1,999,019.430	6,079,388.881
B-22	1,998,843.345	6,079,627.035
B-23	1,998,646.847	6,079,872.078
B-24	1,998,479.016	6,080,102.407
B-25	1,998,295.232	6,080,353.437
B-26	1,998,127.871	6,080,587.959
B-27	1,997,826.559	6,080,943.772
B-28	1,997,727.394	6,081,090.707
B-29	1,997,574.285	6,081,283.255
B-30	1,997,382.996	6,081,519.355
B-31	1,997,262.815	6,081,699.530
B-32	1,997,115.492	6,081,901.848
B-33	1,996,878.079	6,082,192.356
B-34	1,996,693.327	6,082,435.960
B-35	1,996,513.039	6,082,675.252
B-36	1,996,245.678	6,083,025.233
B-37	1,996,062.921	6,083,259.489
B-38	1,995,881.099	6,083,499.797
B-39	1,995,699.235	6,083,736.981
B-40	1,995,519.944	6,083,973.414
B-41	1,995,198.136	6,084,417.155
B-42	1,995,065.897	6,084,628.631
B-43	1,994,941.101	6,084,723.766
B-44	1,994,857.484	6,084,873.638
B-45	1,994,775.042	6,084,943.491
B-46	1,994,715.919	6,085,087.448
B-47	1,994,595.605	6,085,184.900
B-48	1,994,542.400	6,085,303.800

TABLE 1
Boring Coordinates
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Boring	Northing	Easting
B-49	1,994,464.136	6,085,496.276
B-50	1,994,322.707	6,085,634.374
B-51	1,994,152.199	6,085,762.596
B-52	1,993,985.513	6,085,981.139
B-53	1,992,883.124	6,087,422.287
B-54	1,992,747.120	6,087,599.693
B-55	1,992,564.565	6,087,836.138
B-56	1,992,386.674	6,088,076.288
B-57	1,992,214.222	6,088,302.727
B-58	1,991,995.120	6,088,584.610
B-59	1,991,835.945	6,088,789.316
B-60	1,991,662.919	6,089,018.964
B-61	1,991,486.187	6,089,251.610
B-62	1,991,357.127	6,089,418.304
B-63	1,991,231.759	6,089,565.182
B-64	1,991,080.731	6,089,727.702
B-65	1,990,879.289	6,089,935.383
B-66	1,990,663.933	6,090,113.300
B-67	1,990,466.578	6,090,317.079
B-68	2,002,293.865	6,074,783.337
B-69	2,002,112.092	6,075,051.309
B-70	2,001,953.288	6,075,272.788
B-71	2,001,777.023	6,075,517.779
B-72	2,001,590.504	6,075,754.905
B-73	2,001,468.909	6,075,938.681
B-74	2,001,364.641	6,076,075.200
B-75	2,001,161.954	6,076,344.889
B-76	2,000,968.586	6,076,596.277
B-77	2,000,790.197	6,076,838.131
B-78	2,000,591.500	6,077,093.000
B-79	2,000,448.399	6,077,296.335
B-80	2,000,242.451	6,077,540.327
B-81	2,000,054.115	6,077,792.164
B-82	1,999,929.309	6,077,958.636
B-83	1,999,743.709	6,078,195.633
B-84	1,999,613.413	6,078,369.473
B-85	1,999,539.025	6,078,464.483
B-86	1,999,413.304	6,078,650.851
B-87	1,999,307.551	6,078,759.000
B-88	1,999,210.562	6,078,926.080
B-89	1,999,026.268	6,079,162.459
B-90	1,998,823.041	6,079,388.241
B-91	1,998,673.656	6,079,637.928
B-92	1,998,446.341	6,079,880.071
B-93	1,998,295.400	6,080,093.500
B-94	1,998,109.600	6,080,335.300
B-95	1,998,002.460	6,080,497.200
B-96	1,997,867.715	6,080,654.718

TABLE 1
Boring Coordinates
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Boring	Northing	Easting
B-97	1,997,693.249	6,080,895.934
B-98	1,997,492.071	6,081,155.618
B-99	1,997,305.630	6,081,388.927
B-100	1,997,148.695	6,081,598.021
B-101	1,997,065.091	6,081,723.148
B-102	1,996,909.019	6,081,897.283
B-103	1,996,702.240	6,082,160.371
B-104	1,996,527.514	6,082,402.142
B-105	1,996,347.624	6,082,644.878
B-106	1,996,166.356	6,082,883.210
B-107	1,995,984.822	6,083,120.212
B-108	1,995,802.596	6,083,360.245
B-109	1,995,621.262	6,083,597.176
B-110	1,995,439.129	6,083,832.155
B-111	1,995,304.594	6,084,004.851
B-113	1,994,638.534	6,084,889.559
B-114	1,994,418.667	6,085,103.087
B-115	1,994,343.108	6,085,288.846
B-116	1,994,214.590	6,085,371.682
B-117	1,994,147.996	6,085,534.702
B-118	1,994,034.961	6,085,609.209
B-119	1,993,868.179	6,085,654.594
B-120	1,993,980.797	6,085,760.024
B-121	1,993,858.388	6,085,916.835
B-122	1,993,300.933	6,086,628.733
B-123	1,993,108.195	6,086,885.007
B-124	1,992,899.838	6,087,158.911
B-125	1,992,726.744	6,087,415.110
B-126	1,992,537.556	6,087,645.595
B-127	1,992,353.060	6,087,888.189
B-128	1,992,122.300	6,088,173.500
B-129	1,991,962.200	6,088,378.400
B-130	1,991,809.183	6,088,598.583
B-131	1,991,630.026	6,088,836.873
B-132	1,991,490.706	6,089,016.371
B-133	1,991,313.858	6,089,253.131
B-134	1,991,120.836	6,089,479.066
B-135	1,990,891.680	6,089,685.518
B-136	1,990,667.528	6,089,884.164
B-137	1,990,484.322	6,090,022.272

Coordinates are shown in feet, NAD 83 (Zone 3)

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-1 0'	0	34	---	---	---
B-1 1'	1	<5.0	---	---	8.7
B-1 2'	2	<5.0	---	---	---
B-2 0'	0	40	---	---	---
B-2 1'	1	4.0	---	---	---
B-2 2'	2	2.8	---	---	---
B-3 0'	0	360	40	---	---
B-3 1'	1	25	---	---	---
B-3 2'	2	110	15	---	---
B-4 0'	0	130	8.0	---	---
B-4 1'	1	19	---	---	---
B-4 2'	2	92	1.8	---	---
B-5 0'	0	540	22	---	---
B-5 1'	1	390	18	---	---
B-5 2'	2	5.4	---	---	---
B-6 0'	0	290	11	---	---
B-6 1'	1	1,100	---	0.47	7.6
B-6 2'	2	220	2.3	---	---
B-7 0'	0	730	---	<0.25	---
B-7 1'	1	100	0.39	---	7.3
B-7 2'	2	280	14	---	---
B-7 4'	4	12	---	---	---
B-7 6'	6	3.7	---	---	---
B-8 0'	0	840	---	<0.25	---
B-8 1'	1	450	24	---	---
B-8 2'	2	560	6.1	---	---
B-9 0'	0	610	---	---	---
B-9 1'	1	470	19	---	7.7
B-9 2'	2	15	---	---	---
B-10 0'	0	680	---	<0.25	---
B-10 1'	1	56	1.2	---	---
B-10 2'	2	7.7	---	---	---
B-11 0'	0	1,100	---	0.51	---
B-11 1'	1	120	7.6	---	---
B-11 2'	2	21	---	---	---
B-12 0'	0	500	28	---	---
B-12 1'	1	320	12	---	7.8
B-12 2'	2	100	1.8	---	---
B-13 0'	0	15	---	---	---
B-13 1'	1	7.0	---	---	---
B-13 2'	2	50	---	---	---

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-14 0'	0	33	---	---	---
B-14 1'	1	12	---	---	7.8
B-14 2'	2	8.1	---	---	---
B-15 0'	0	170	5.6	---	---
B-15 1'	1	11	---	---	8.1
B-15 2'	2	4.1	---	---	---
B-16 0'	0	28	---	---	---
B-16 1'	1	11	---	---	---
B-16 2'	2	<5.0	---	---	---
B-17 0'	0	110	3.7	---	---
B-17 1'	1	120	8.7	---	---
B-17 2'	2	7.4	---	---	---
B-17 6'	6	5.5	---	---	---
B-17 12'	12	8.3	---	---	---
B-17 18'	18	6.8	---	---	---
B-18 0'	0	23	---	---	---
B-18 1'	1	6.6	---	---	---
B-18 2'	2	4.4	---	---	---
B-19 0'	0	190	10	---	---
B-19 1'	1	57	<0.25	---	---
B-19 2'	2	26	---	---	---
B-19 6'	6	7.4	---	---	---
B-19 12'	12	4.9	---	---	---
B-19 18'	18	4.9	---	---	---
B-20 0'	0	16	---	---	---
B-20 1'	1	10	---	---	8.1
B-20 2'	2	<5.0	---	---	---
B-21 0'	0	4.2	---	---	---
B-21 1'	1	18	---	---	---
B-21 2'	2	4.2	---	---	---
B-22 0'	0	55	4.5	---	---
B-22 1'	1	17	---	---	---
B-22 2'	2	6.4	---	---	---
B-23 0'	0	32	---	---	---
B-23 1'	1	4.1	---	---	8.3
B-23 2'	2	3.6	---	---	---
B-24 0'	0	26	---	---	---
B-24 1'	1	100	18	---	---
B-24 2'	2	7.2	---	---	---
B-25 0'	0	74	1.1	---	---
B-25 1'	1	2.8	---	---	---

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-25 2'	2	5.3	---	---	---
B-26 0'	0	450	7.5	---	---
B-26 1'	1	23	---	---	7.4
B-26 2'	2	12	---	---	---
B-27 0'	0	1,200	---	0.55	---
B-27 1'	1	15	---	---	---
B-27 2'	2	<5.0	---	---	---
B-28 0'	0	5,300	---	4.6	---
B-28 1'	1	150	6.3	---	---
B-28 2'	2	9.3	---	---	---
B-29 0'	0	270	4.7	---	---
B-29 1'	1	110	5.9	---	8.1
B-29 2'	2	31	---	---	---
B-30 0'	0	590	25	---	---
B-30 1'	1	63	1.9	---	---
B-30 2'	2	35	---	---	---
B-31 0'	0	100	71	---	---
B-31 1'	1	130	13	---	---
B-31 2'	2	9.6	---	---	---
B-32 0'	0	35	---	---	---
B-32 1'	1	140	13	---	7.7
B-32 2'	2	89	9.5	---	---
B-33 0'	0	50	---	---	---
B-33 1'	1	25	---	---	---
B-33 2'	2	8.7	---	---	---
B-34 0'	0	18	---	---	---
B-34 1'	1	110	<0.25	---	---
B-34 2'	2	7.2	---	---	---
B-35 0'	0	99	4.1	---	---
B-35 1'	1	560	29	---	7.3
B-35 2'	2	8.7	---	---	---
B-36 0'	0	23	---	---	---
B-36 1'	1	1,400	---	6.2	---
B-36 2'	2	5.1	---	---	---
B-37 0'	0	32	---	---	---
B-37 1'	1	360	4.3	---	---
B-37 2'	2	7.6	---	---	---
B-38 0'	0	30	---	---	---
B-38 1'	1	9.3	---	---	8.6
B-38 2'	2	22	---	---	---

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-39 0'	0	39	---	---	---
B-39 1'	1	990	---	0.30	---
B-39 2'	2	12	---	---	---
B-40 0'	0	16	---	---	---
B-40 1'	1	180	5.8	---	---
B-40 2'	2	12	---	---	---
B-41 0'	0	130	8.3	---	---
B-41 1'	1	290	0.70	---	8.3
B-41 2'	2	<5.0	---	---	---
B-42 0'	0	<5.0	---	---	---
B-42 1'	1	6.7	---	---	---
B-42 2'	2	6.4	---	---	---
B-43 0'	0	4,600	---	3.9	---
B-43 1'	1	8.6	---	---	---
B-43 2'	2	7.5	---	---	---
B-44 0'	0	910	---	0.68	---
B-44-1'	1	43	---	---	---
B-44 2'	2	<5.0	---	---	---
B-45 0'	0	17	---	---	---
B-45 1'	1	36	---	---	---
B-45 2'	2	12	---	---	---
B-46 0'	0	79	5.9	---	---
B-46 1'	1	34	---	---	---
B-46 2'	2	12	---	---	---
B-47 0'	0	390	16	---	---
B-47 1'	1	140	5.9	---	---
B-47 2'	2	<5.0	---	---	---
B-48 0'	0	200	4.0	---	---
B-48 1'	1	1,200	---	0.49	7.2
B-48 2'	2	49	---	---	---
B-49 0'	0	23	---	---	---
B-49 1'	1	8.0	---	---	---
B-49 2'	2	6.1	---	---	---
B-50 0'	0	49	---	---	---
B-50 1'	1	42	---	---	---
B-50 2'	2	14	---	---	---
B-51 0'	0	59	3.4	---	---
B-51 1'	1	37	---	---	8.2
B-51 2'	2	<5.0	---	---	---

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-52 0'	0	210	17	---	---
B-52 1'	1	470	0.51	---	---
B-52 2'	2	1.0	---	---	---
B-53 0'	0	27	---	---	---
B-53 1'	1	53	1.2	---	---
B-53 2'	2	51	0.93	---	---
B-54 0'	0	37	---	---	
B-54 1'	1	16	---	---	8.1
B-54 2'	2	12	---	---	---
B-55 0'	0	19	---	---	---
B-55 1'	1	57	10	---	---
B-55 2'	2	<5.0	---	---	---
B-56 0'	0	21	---	---	---
B-56 1'	1	1,100	---	0.77	---
B-56 2'	2	9.7	---	---	---
B-57 0'	0	310	11	---	---
B-57 1'	1	11	---	---	---
B-57 2'	2	<5.0	---	---	---
B-58 0'	0	260	19	---	---
B-58 1'	1	6.9	---	---	---
B-58 2'	2	10	---	---	---
B-59 0'	0	40	---	---	---
B-59 1'	1	5.3	---	---	8.3
B-59 2'	2	7.3	---	---	---
B-60 0'	0	39	---	---	---
B-60 1'	1	46	---	---	7.9
B-60 2'	2	6.5	---	---	---
B-60 4'	4	6.1	---	---	---
B-60 6'	6	6.3	---	---	---
B-61 0'	0	2,000	---	2.3	---
B-61 1'	1	33	---	---	---
B-61 2'	2	10	---	---	---
B-62 0'	0	260	12	---	---
B-62 1'	1	1,600	---	5.6	---
B-62 2'	2	23	---	---	---
B-63 0'	0	85	3.0	---	8.0
B-63 1'	1	4,100	---	5.6	8.1
B-63 2'	2	11	---	---	7.9
B-64 0'	0	78	6.1	---	---
B-64 1'	1	6.8	---	---	---
B-64 2'	2	7.9	---	---	---

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-65 0'	0	1,000	---	0.38	---
B-65 1'	1	1,200	---	0.71	---
B-65 2'	2	830	---	0.87	---
B-66 0'	0	1,400	---	1.7	---
B-66 1'	1	180	9.5	---	8.0
B-66 2'	2	11		---	---
B-67 0'	0	440	25	---	---
B-67 1'	1	31	---	---	---
B-67 2'	2	3.5	---	---	---
B-68 0'	0	140	7.1	---	---
B-68 1'	1	26	---	---	---
B-68 2'	2	1,900	---	<0.25	---
B-69 0'	0	7.8	---	---	8.1
B-69 1'	1	1.5	---	---	8.5
B-69 2'	2	55	2.0	---	8.3
B-70 0'	0	130	11	---	---
B-70 1'	1	29	---	---	---
B-70 2'	2	8.3	---	---	---
B-71 0'	0	1,000	---	0.75	---
B-71 1'	1	470	20	---	---
B-71 2'	2	7.2	---	---	---
B-72 0'	0	1,400	---	0.33	7.2
B-72 1'	1	330	9.3	---	8.1
B-72 2'	2	<5.0	---	---	8.7
B-73 0'	0	160	19	---	---
B-73 1'	1	10	---	---	7.9
B-73 2'	2	<5.0	---	---	---
B-73 4'	4	5.0	---	---	---
B-73 6'	6	4.4	---	---	---
B-74 0'	0	120	8.5	---	---
B-74 1'	1	160	5.9	---	7.9
B-74 2'	2	5.3	---	---	---
B-74 4'	4	3.5	---	---	---
B-74 6'	6	4.4	---	---	---
B-75 0'	0	370	24	---	---
B-75 1'	1	87	2.1	---	8.0
B-75 2'	2	57	1.6	---	---
B-75 4'	4	3.8	---	---	---
B-75 6'	6	3.2	---	---	---
B-76 0'	0	130	13	---	---
B-76 1'	1	8.2	---	---	8.0

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-76 2'	2	3.3	---	---	---
B-76 4'	4	4.4	---	---	---
B-76 6'	6	6.8	---	---	---
B-77 0'	0	210	3.9	---	---
B-77 1'	1	210	3.4	---	8.1
B-77 2'	2	5.6	---	---	---
B-77 4'	4	3.4	---	---	---
B-77 6'	6	2.8	---	---	---
B-78 0'	0	17	---	---	---
B-78 1'	1	27	---	---	7.8
B-78 2'	2	4.1	---	---	---
B-78 4'	4	6.0	---	---	---
B-78 6'	6	7.5	---	---	---
B-79 0'	0	2,700	---	0.86	---
B-79 1'	1	25	---	---	---
B-79 2'	2	2.4	---	---	---
B-80 0'	0	130	9.6	---	---
B-80 1'	1	1,100	---	0.44	---
B-80 2'	2	5.2	---	---	---
B-81 0'	0	450	3.8	---	7.5
B-81 1'	1	14	---	---	7.9
B-81 2'	2	16	---	---	8.4
B-82 0'	0	10	---	---	---
B-82 1'	1	870	---	<0.25	---
B-82 2'	2	8.9	---	---	---
B-83 0'	0	72	3.8	---	---
B-83 1'	1	1,300	---	2.9	---
B-83 2	2	12	---	---	---
B-84 0'	0	470	15	---	---
B-84 1'	1	9.5	---	---	---
B-84 2'	2	8.0	---	---	---
B-84 6'	6	8.5	---	---	---
B-84 12'	12	6.5	---	---	---
B-84 18'	18	4.8	---	---	---
B-85 0	0	11	---	---	8.4
B-85 1'	1	37	---	---	7.7
B-85 2'	2	6.1	---	---	7.6
B-86 0'	0	490	25	---	---
B-86 1'	1	150	9.0	---	---
B-86 2'	2	7.0	---	---	---
B-87 0'	0	300	14	---	---
B-87 1'	1	42	---	---	---

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-87 2'	2	8.0	---	---	---
B-87 6'	6	5.8	---	---	---
B-87 12'	12	4.5	---	---	---
B-87 18'	18	4.0	---	---	---
B-88 0'	0	1,100	---	2.2	---
B-88 1'	1	140	8.9	---	---
B-88 2'	2	8.0	---	---	---
B-89 0'	0	100	6.6	---	---
B-89 1'	1	630	---	---	---
B-89 2'	2	8.0	---	---	---
B-90 0'	0	30	---	---	---
B-90 1'	1	65	1.4	---	---
B-90 2'	2	7.1	---	---	---
B-91 0'	0	480	37	---	---
B-91 1'	1	9.1	---	---	---
B-91 2'	2	7.9	---	---	---
B-92 0'	0	560	25	---	7.6
B-92 1'	1	83	2.5	---	8.3
B-92 2'	2	8.4	---	---	7.9
B-93 0'	0	530	19	---	---
B-93 1'	1	160	7.4	---	---
B-93 2'	2	18	---	---	---
B-94 0'	0	46	---	---	---
B-94 1'	1	5.7	---	---	---
B-94 2'	2	6.7	---	---	---
B-95 0'	0	980	---	0.65	---
B-95 1'	1	22	---	---	---
B-95 2'	2	10	---	---	---
B-96 0'	0	1,100	---	0.50	7.4
B-96 1'	1	280	29	---	8.0
B-96 2'	2	8.2	---	---	7.7
B-97 0'	0	140	11	---	---
B-97 1'	1	22	---	---	---
B-97 2'	2	6.9	---	---	---
B-98 0'	0	240	15	---	---
B-98 1'	1	65	1.4	---	---
B-98 2'	2	15	---	---	---
B-99 0'	0	810	---	0.80	---
B-99 1'	1	790	---	1.3	7.8
B-99 2'	2	820	---	0.79	---

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-100 0'	0	5,300	---	1.1	---
B-100 1'	1	83	2.8	---	---
B-100 2'	2	18	---	---	---
B-101 0'	0	27	---	---	---
B-101 1'	1	490	40	---	---
B-101 2'	2	190	5.3	---	---
B-102 0'	0	170	12	---	7.4
B-102 1'	1	21	---	---	8.3
B-102 2'	2	11	---	---	8.3
B-103 0'	0	880	---	0.40	---
B-103 1'	1	79	1.5	---	---
B-103 2'	2	6.6	---	---	---
B-104 0'	0	1,800	---	51	---
B-104 1'	1	15	---	---	---
B-104 2'	2	15	---	---	---
B-105 0'	0	98	65	---	7.6
B-105 1'	1	16	---	---	7.8
B-105 2'	2	8.3	---	---	7.5
B-106 0'	0	1,200	---	1.9	---
B-106 1'	1	13	---	---	---
B-106 2'	2	8.6	---	---	---
B-107 0'	0	1,200	---	2.6	---
B-107 1'	1	6.1	---	---	---
B-107 2'	2	5.7	---	---	---
B-108 0'	0	56	4.1	---	7.8
B-108 1'	1	7.5	---	---	8.5
B-108 2'	2	7.0	---	---	7.5
B-109 0'	0	350	18	---	---
B-109 1'	1	540	38	---	---
B-109 2'	2	13	---	---	---
B-110 0'	0	30	---	---	---
B-110 1'	1	13	---	---	---
B-110 2'	2	6.3	---	---	---
B-111 0'	0	<5.0	---	---	7.4
B-111 1'	1	120	1.4	---	7.8
B-111 2'	2	8.6	---	---	7.1
B-113 0'	0	580	48	---	---
B-113 1'	1	45	---	---	---
B-113 2'	2	8.1	---	---	---
B-114 0'	0	21	---	---	---

TABLE 2
Summary of Lead and pH Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	TCLP Lead (mg/l)	pH
B-114 1'	1	8.5	---	---	7.7
B-114 2'	2	6.0	---	---	---
B-115 0'	0	43	---	---	---
B-115 1'	1	10	---	---	---
B-115 2'	2	6.4	---	---	---
B-116 0'	0	75	3.1	---	---
B-116 1'	1	93	3.3	---	---
B-116 2'	2	14	---	---	---
B-117 0'	0	1,500	---	<0.25	---
B-117 1'	1	9.6	---	---	7.0
B-117 2'	2	5.9	---	---	---
B-118 0'	0	98	4.3	---	---
B-118 1'	1	100	7.0	---	---
B-118 2'	2	8.7	---	---	---
B-119 0'	0	83	1.7	---	---
B-119 1'	1	96	3.5	---	---
B-119 2'	2	6.1	---	---	---
B-120 0'	0	33	---	---	---
B-120 1'	1	36	---	---	7.2
B-120 2'	2	<5.0	---	---	---
B-121 0'	0	270	23	---	---
B-121 1'	1	21	---	---	---
B-121 2'	2	11	---	---	---
B-122 0'	0	1,900	---	2.1	---
B-122 1'	1	250	7.9	---	---
B-122 2'	2	20	---	---	---
B-123 0'	0	23	---	---	7.6
B-123 1'	1	540	4.1	---	8.0
B-123 2'	2	8.0	---	---	7.8
B-124 0'	0	89	---	---	---
B-124 1'	1	8.1	13	---	---
B-124 2'	2	6.6	---	---	---

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: Lead ıg/l)	TCLP Lead (mg/l)	pH
---	---	---
---	---	---
---	---	---
---	---	---
.82	---	---
---	---	---
---	---	---
---	---	---
---	---	---
---	---	---
---	---	---
---	---	---
---	---	8.2
---	---	7.7
---	---	7.6
---	0.51	---
15	---	---
---	---	---
---	5.2	---
---	<0.25	---
---	---	---
61	---	8.1
---	---	8.4
---	---	8.1
31	---	---
14	---	---
---	---	---
---	---	---
---	---	---
---	---	---
---	0.53	---
22	---	---

TABLE 3
Summary of CAM17 Metals Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B-2 0'	0	<2.0	<1.0	290	<1.0	1.0	130	20	26	40	<1.0	350	<1.0	<1.0	<1.0	23	87	0.14
B-2 1'	1	<2.0	<1.0	210	<1.0	<1.0	4.6	4.0	<2.0	4.0	<1.0	3.5	<1.0	<1.0	<1.0	27	1,600	<0.10
B-2 2'	2	<2.0	<1.0	220	<1.0	<1.0	4.1	3.8	<2.0	2.8	<1.0	1.5	<1.0	<1.0	<1.0	27	85	<0.10
B-7 0'	0	<2.0	2.0	160	<1.0	1.1	37	7.1	51	730	14	39	<1.0	<1.0	<1.0	36	150	0.19
B-7 1'	1	<2.0	<1.0	410	<1.0	<1.0	20	11	29	100	11	58	<1.0	<1.0	<1.0	24	60	0.21
B-7 2'	2	<2.0	2.1	140	<1.0	<1.0	35	6.2	34	280	14	31	<1.0	<1.0	<1.0	38	95	<0.10
B-7 4'	4	12	10	150	<1.0	1.2	37	17	32	12	<1.0	71	1.7	<1.0	<1.0	51	130	0.10
B-7 6'	6	5.9	2.3	110	<1.0	<1.0	32	7.0	24	8.3	<1.0	36	1.4	<1.0	<1.0	40	51	<0.10
B-8 0'	0	3.7	<1.0	200	<1.0	2.2	53	9.8	61	840	<1.0	57	<1.0	<1.0	<1.0	40	260	0.19
B-8 1'	1	2.6	<1.0	130	<1.0	1.7	50	9.2	42	450	<1.0	50	<1.0	<1.0	<1.0	37	160	0.12
B-8 2'	2	2.8	<1.0	140	<1.0	1.7	54	9.8	41	5.2	<1.0	62	<1.0	<1.0	<1.0	39	160	0.17
B-11 0'	0	3.5	<1.0	210	<1.0	2.7	51	8.2	120	1,100	1.2	66	<1.0	<1.0	<1.0	34	420	0.26
B-11 1'	1	<2.0	<1.0	120	<1.0	1.3	32	7.1	22	120	<1.0	39	<1.0	<1.0	<1.0	32	73	<0.10
B-11 2'	2	<2.0	<1.0	130	<1.0	1.0	35	7.2	19	21	<1.0	34	<1.0	<1.0	<1.0	34	45	<0.10
B-13 0'	0	<2.0	<1.0	130	<1.0	<1.0	14	8.5	39	15	15	17	<1.0	<1.0	<1.0	32	26	<0.10
B-13 1'	1	<2.0	1.9	160	<1.0	1.3	32	8.6	34	7.0	1.8	42	<1.0	<1.0	<1.0	35	59	<0.10
B-13 2'	2	<2.0	<1.0	96	<1.0	<1.0	22	5.3	12	50	<1.0	24	<1.0	<1.0	<1.0	22	90	1.6
B-15 0'	0	<2.0	<1.0	150	<1.0	1.3	42	9.0	36	170	<1.0	39	<1.0	<1.0	<1.0	43	110	<0.10
B-15 1'	1	<2.0	<1.0	150	<1.0	<1.0	27	8.5	18	11	<1.0	33	<1.0	<1.0	<1.0	28	64	0.79
B-15 2'	2	<2.0	<1.0	100	<1.0	<1.0	61	6.8	17	4.1	<1.0	48	<1.0	<1.0	<1.0	33	43	<0.10
B-17 0'	0	<2.0	<1.0	140	<1.0	<1.0	46	11	32	110	<1.0	43	<1.0	<1.0	<1.0	54	120	<0.10
B-17 1'	1	<2.0	<1.0	130	<1.0	1.1	46	12	33	120	<1.0	45	<1.0	<1.0	<1.0	56	880	0.37
B-17 2'	2	<2.0	4.4	190	<1.0	<1.0	37	8.4	24	7.4	<1.0	39	<1.0	<1.0	<1.0	41	60	<0.10
B-17 6'	0	<2.0	2.4	150	<1.0	<1.0	38	6.2	22	5.5	<1.0	34	<1.0	<1.0	<1.0	39	49	<0.10
B-17 12'	12	<2.0	7.6	150	<1.0	<1.0	33	6.9	24	8.3	<1.0	32	<1.0	<1.0	<1.0	49	58	<0.10

TABLE 3
Summary of CAM17 Metals Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B-17 18'	18	<2.0	5.2	83	<1.0	<1.0	33	8.1	21	6.8	<1.0	38	<1.0	<1.0	<1.0	39	60	<0.10
B-18 0'	0	<2.0	<1.0	220	<1.0	1.2	35	7.8	38	23	<1.0	47	<1.0	<1.0	<1.0	38	110	<0.10
B-18 1'	1	<2.0	<1.0	160	<1.0	1.2	24	7.0	15	6.6	<1.0	28	<1.0	<1.0	<1.0	25	52	<0.10
B-18 2'	2	<2.0	<1.0	77	<1.0	<1.0	33	5.4	18	4.4	<1.0	32	<1.0	<1.0	<1.0	28	46	<0.10
B-19 0'	0	<2.0	<1.0	110	<1.0	1.0	44	13	35	190	<1.0	42	<1.0	<1.0	<1.0	68	92	<0.10
B-19 1'	1	<2.0	3.0	160	<1.0	<1.0	47	9.8	25	57	<1.0	47	<1.0	<1.0	<1.0	40	79	<0.10
B-19 2'	2	<2.0	3.8	130	<1.0	<1.0	28	7.1	19	26	<1.0	34	<1.0	<1.0	<1.0	32	53	0.22
B-19 6'	6	<2.0	4.7	180	<1.0	<1.0	37	8.7	23	7.4	<1.0	41	<1.0	<1.0	<1.0	44	56	0.12
B-19 12'	12	<2.0	<1.0	91	<1.0	1.9	32	5.7	19	4.9	<1.0	34	<1.0	<1.0	<1.0	27	53	<0.10
B-19 18'	18	<2.0	<1.0	56	<1.0	<1.0	34	5.5	20	4.9	<1.0	40	<1.0	<1.0	<1.0	33	44	<0.10
B-21 0'	0	2.5	<1.0	260	<1.0	<1.0	24	8.5	19	4.2	<1.0	37	<1.0	<1.0	<1.0	49	39	<0.10
B-21 1'	1	4.7	<1.0	130	<1.0	1.2	41	13	40	18	<1.0	27	<1.0	<1.0	<1.0	70	39	<0.10
B-21 2'	2	2.1	<1.0	130	<1.0	<1.0	29	6.9	10	4.2	<1.0	30	<1.0	<1.0	<1.0	28	35	<0.10
B-23 0'	0	2.3	<1.0	430	<1.0	1.5	53	12	28	32	<1.0	85	<1.0	<1.0	<1.0	47	54	<0.10
B-23 1'	1	7.0	<1.0	46	<1.0	1.6	40	18	31	4.1	<1.0	26	<1.0	<1.0	<1.0	110	46	<0.10
B-23 2'	2	<2.0	<1.0	130	<1.0	<1.0	29	6.5	12	3.6	<1.0	30	<1.0	<1.0	<1.0	29	37	<0.10
B-25 0'	0	<2.0	<1.0	150	<1.0	1.0	33	8.6	61	74	1.3	35	<1.0	<1.0	<1.0	59	990	<0.10
B-25 1'	1	<2.0	<1.0	55	<1.0	1.7	84	21	44	2.8	<1.0	39	<1.0	<1.0	<1.0	140	50	<0.10
B-25 2'	2	2.3	<1.0	110	<1.0	<1.0	31	6.2	13	5.3	<1.0	26	<1.0	<1.0	<1.0	32	36	<0.10
B-28 0'	0	<2.0	<1.0	200	<1.0	2.8	50	11	82	5,300	<1.0	51	<1.0	<1.0	<1.0	51	470	0.11
B-28 1'	1	<2.0	<1.0	130	<1.0	1.5	56	16	40	150	<1.0	39	<1.0	<1.0	<1.0	96	84	<0.10
B-28 2'	2	<2.0	<1.0	180	<1.0	1.1	46	8.6	25	9.3	<1.0	37	<1.0	<1.0	<1.0	49	1,200	<0.10
B-31 0'	0	<2.0	<1.0	130	<1.0	1.4	46	11	32	100	1.4	35	<1.0	<1.0	<1.0	68	75	0.16
B-31 1'	1	<2.0	<1.0	190	<1.0	1.2	40	11	32	130	1.1	39	<1.0	<1.0	<1.0	43	87	<0.10

TABLE 3
Summary of CAM17 Metals Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B-31 2'	2	<2.0	<1.0	180	<1.0	1.2	50	9.3	25	9.6	<1.0	41	<1.0	<1.0	<1.0	50	65	<0.10
B-32 0'	0	3.0	<1.0	320	<1.0	1.1	31	6.1	41	35	<1.0	33	<1.0	<1.0	<1.0	32	190	<0.10
B-32 1'	1	<2.0	<1.0	160	<1.0	1.2	38	8.5	25	140	<1.0	38	<1.0	<1.0	<1.0	39	110	<0.10
B-32 2'	2	2.0	<1.0	130	<1.0	1.3	39	9.4	25	89	<1.0	38	<1.0	<1.0	<1.0	43	85	<0.10
B-33 0'	0	<2.0	<1.0	370	<1.0	1.3	49	11	56	50	<1.0	61	<1.0	<1.0	<1.0	54	110	<0.10
B-33 1'	1	<2.0	1.3	190	<1.0	1.2	40	9.4	25	25	1.3	43	<1.0	<1.0	<1.0	39	64	<0.10
B-33 2'	2	<2.0	3.2	260	<1.0	1.4	50	10	27	8.7	<1.0	44	<1.0	<1.0	<1.0	54	77	<0.10
B-35 0'	0	<2.0	<1.0	320	<1.0	1.4	58	10	54	99	<1.0	69	<1.0	<1.0	<1.0	48	150	<0.10
B-35 1'	1	<2.0	<1.0	250	<1.0	1.7	42	11	41	560	1.4	45	<1.0	<1.0	<1.0	43	150	<0.10
B-35 2'	2	<2.0	2.4	190	<1.0	1.2	44	8.7	25	8.7	<1.0	39	<1.0	<1.0	<1.0	47	68	<0.10
B-37 0'	0	<2.0	<1.0	350	<1.0	1.5	50	13	67	32	1.7	74	<1.0	<1.0	<1.0	54	180	<0.10
B-37 1'	1	<2.0	<1.0	210	<1.0	1.3	41	9.0	30	360	2.3	39	<1.0	<1.0	<1.0	47	110	<0.10
B-37 2'	2	<2.0	1.6	190	<1.0	1.2	45	8.9	23	7.6	<1.0	42	<1.0	<1.0	<1.0	45	65	<0.10
B-39 0'	0	<2.0	<1.0	430	<1.0	1.8	68	16	67	39	2.2	91	<1.0	<1.0	<1.0	71	180	<0.10
B-39 1'	1	<2.0	<1.0	180	<1.0	1.9	90	15	48	990	1.0	150	<1.0	<1.0	<1.0	47	230	<0.10
B-39 2'	2	<2.0	<1.0	150	<1.0	<1.0	38	7.7	19	12	<1.0	36	<1.0	<1.0	<1.0	39	53	0.16
B-41 0'	0	<2.0	<1.0	470	<1.0	1.3	47	8.2	86	130	1.7	47	<1.0	<1.0	<1.0	37	170	<0.10
B-41 1'	1	<2.0	<1.0	86	<1.0	1.3	47	13	38	290	<1.0	70	<1.0	<1.0	<1.0	61	110	<0.10
B-41 2'	2	<2.0	<1.0	32	<1.0	1.4	37	22	44	6.4	<1.0	31	<1.0	<1.0	<1.0	97	80	<0.10
B-43 0'	0	<2.0	5.5	170	<1.0	3.5	52	9.8	96	4,600	<1.0	51	<1.0	<1.0	<1.0	37	2,300	0.18
B-43 1'	1	<2.0	<1.0	14	<1.0	1.6	47	17	60	8.6	<1.0	29	<1.0	<1.0	<1.0	88	60	<0.10
B-43 2'	2	<2.0	2.9	170	<1.0	1.1	30	8.1	21	12	<1.0	36	<1.0	<1.0	<1.0	29	61	<0.10
B-46 0'	0	<2.0	<1.0	76	<1.0	1.3	43	14	36	79	<1.0	29	<1.0	<1.0	<1.0	75	68	<0.10

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B-46 1'	1	<2.0	<1.0	140	<1.0	1.2	36	15	44	34	<1.0	32	<1.0	<1.0	<1.0	70	88	<0.10
B-46 2'	2	<2.0	1.4	150	<1.0	1.1	32	7.4	25	49	<1.0	34	<1.0	<1.0	<1.0	34	79	0.51
B-49 0'	0	<2.0	<1.0	130	<1.0	1.3	47	13	40	23	<1.0	38	<1.0	<1.0	<1.0	63	110	<0.10
B-49 1'	1	<2.0	3.0	170	<1.0	1.3	31	9.0	23	8.0	<1.0	37	<1.0	<1.0	<1.0	33	75	0.16
B-49 2'	2	<2.0	1.4	140	<1.0	<1.0	28	6.6	20	<5.0	<1.0	30	<1.0	<1.0	<1.0	30	66	<0.10
B-52 0'	0	<2.0	<1.0	290	<1.0	1.2	36	8.2	53	210	<1.0	41	<1.0	<1.0	<1.0	38	140	<0.10
B-52 1'	1	<2.0	<1.0	160	<1.0	1.3	55	14	46	470	2.2	45	<1.0	<1.0	<1.0	46	87	<0.10
B-52 2'	2	<2.0	<1.0	51	<1.0	<1.0	46	19	40	51	<1.0	31	<1.0	<1.0	<1.0	66	40	<0.10
B-54 0'	0	<2.0	<1.0	280	<1.0	1.5	48	12	52	37	<1.0	72	<1.0	<1.0	<1.0	69	140	<0.10
B-54 1'	1	<2.0	<1.0	210	<1.0	1.5	46	13	33	16	<1.0	51	<1.0	<1.0	<1.0	55	75	<0.10
B-54 2'	2	<2.0	4.1	250	<1.0	1.9	49	12	37	<5.0	<1.0	56	<1.0	<1.0	<1.0	51	110	<0.10
B-56 0'	0	<2.0	<1.0	440	<1.0	1.0	44	8.9	41	21	<1.0	74	<1.0	<1.0	<1.0	37	120	0.11
B-56 1'	1	<2.0	<1.0	160	<1.0	2.3	57	10	78	1,100	1.2	56	<1.0	<1.0	<1.0	46	220	0.13
B-56 2'	2	<2.0	2.4	180	<1.0	1.3	34	9.0	25	220	<1.0	41	<1.0	<1.0	<1.0	35	76	<0.10
B-60 0'	0	8.2	<1.0	190	<1.0	1.0	45	8.9	84	39	2.4	47	<1.0	<1.0	<1.0	49	230	<0.10
B-60 1'	1	8.0	2.3	130	<1.0	<1.0	32	8.8	22	46	<1.0	34	<1.0	<1.0	<1.0	39	52	<0.10
B-60 2'	2	7.7	3.8	130	<1.0	<1.0	27	6.7	16	6.5	<1.0	31	<1.0	<1.0	<1.0	29	47	<0.10
B-60 4'	4	8.6	4.3	150	<1.0	<1.0	28	7.0	19	6.1	<1.0	33	<1.0	<1.0	<1.0	30	56	<0.10
B-60 6'	6	8.8	4.6	160	<1.0	1.1	28	6.4	20	23	<1.0	31	<1.0	<1.0	<1.0	32	56	<0.10
B-63 0'	0	<2.0	<1.0	230	<1.0	1.3	43	7.9	51	85	<1.0	45	<1.0	<1.0	<1.0	40	170	<0.10
B-63 1'	1	<2.0	<1.0	160	<1.0	2.6	71	13	59	4,100	<1.0	67	<1.0	<1.0	<1.0	56	320	0.11
B-63 2'	2	<2.0	<1.0	140	<1.0	<1.0	30	6.7	15	7.9	<1.0	30	<1.0	<1.0	<1.0	31	47	<0.10
B-65 0'	0	4.4	<1.0	240	<1.0	2.5	66	9.8	130	1,000	1.9	67	<1.0	<1.0	<1.0	46	450	0.16
B-65 1'	1	4.3	<1.0	110	<1.0	1.8	58	14	56	1,200	<1.0	48	<1.0	<1.0	<1.0	61	230	0.10

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B-65 2'	2	4.1	<1.0	80	<1.0	1.7	54	18	49	11	<1.0	42	<1.0	<1.0	<1.0	73	120	0.10
B-67 0'	0	4.0	<1.0	160	<1.0	1.7	58	10	49	440	<1.0	47	<1.0	<1.0	<1.0	48	210	<0.10
B-67 1'	1	2.4	<1.0	81	<1.0	<1.0	39	12	32	31	<1.0	29	<1.0	<1.0	<1.0	50	42	0.34
B-67 2'	2	4.9	<1.0	23	<1.0	1.3	55	18	33	1,900	<1.0	35	<1.0	<1.0	<1.0	83	42	<0.10
B-69 0'	0	<2.0	<1.0	35	<1.0	<1.0	8.5	9.1	40	7.8	<1.0	12	<1.0	<1.0	<1.0	70	57	0.14
B-69 1'	1	<2.0	<1.0	64	<1.0	<1.0	12	12	41	1.5	<1.0	35	<1.0	<1.0	<1.0	71	38	<0.10
B-69 2'	2	<2.0	<1.0	66	<1.0	1.3	47	16	39	55	<1.0	36	<1.0	<1.0	<1.0	91	61	<0.10
B-71 0'	0	<2.0	<1.0	160	<1.0	2.5	68	11	68	1,000	<1.0	64	<1.0	<1.0	<1.0	46	260	0.14
B-71 1'	1	<2.0	<1.0	120	<1.0	1.9	61	14	43	470	<1.0	42	<1.0	<1.0	<1.0	74	100	0.18
B-71 2'	2	<2.0	<1.0	58	<1.0	1.6	45	20	36	<5.0	<1.0	30	<1.0	<1.0	<1.0	120	51	<0.10
B-73 0'	0	<2.0	1.3	150	<1.0	<1.0	34	8.0	55	160	13	37	<1.0	<1.0	<1.0	39	91	<0.10
B-73 1'	1	<2.0	1.7	150	<1.0	<1.0	37	7.6	22	10	14	38	<1.0	<1.0	<1.0	36	60	<0.10
B-73 2'	2	<2.0	<1.0	42	<1.0	<1.0	62	20	45	<5.0	21	37	<1.0	<1.0	<1.0	110	52	<0.10
B-73 4'	4	<2.0	5.0	260	<1.0	<1.0	31	8.8	24	5.0	14	29	<1.0	<1.0	<1.0	44	57	<0.10
B-73 6'	6	<2.0	<1.0	64	<1.0	<1.0	34	5.7	16	4.4	12	25	<1.0	<1.0	<1.0	30	55	<0.10
B-74 0'	0	<2.0	<1.0	130	<1.0	<1.0	30	8.5	27	120	13	40	<1.0	<1.0	<1.0	37	62	<0.10
B-74 1'	1	<2.0	<1.0	130	<1.0	<1.0	35	8.6	28	160	14	39	<1.0	<1.0	<1.0	40	75	<0.10
B-74 2'	2	<2.0	1.3	100	<1.0	<1.0	32	8.1	22	5.3	14	34	<1.0	<1.0	<1.0	39	61	<0.10
B-74 4'	4	<2.0	<1.0	68	<1.0	<1.0	27	4.8	16	3.5	11	26	<1.0	<1.0	<1.0	27	41	<0.10
B-74 6'	6	<2.0	1.9	140	<1.0	<1.0	30	9.0	29	4.4	14	45	<1.0	<1.0	<1.0	36	51	<0.10
B-75 0'	0	<2.0	<1.0	84	<1.0	<1.0	36	8.0	23	370	13	37	<1.0	<1.0	<1.0	42	58	<0.10
B-75 1'	1	<2.0	<1.0	57	<1.0	<1.0	52	12	27	87	15	35	<1.0	<1.0	<1.0	67	51	<0.10
B-75 2'	2	<2.0	<1.0	18	<1.0	<1.0	37	4.6	7.5	57	9.0	20	<1.0	<1.0	<1.0	41	45	<0.10
B-75 4'	4	<2.0	<1.0	62	<1.0	<1.0	36	5.2	20	3.8	14	30	<1.0	<1.0	<1.0	34	46	<0.10
B-75 6'	6	<2.0	<1.0	480	<1.0	<1.0	33	7.2	18	3.2	15	30	<1.0	<1.0	<1.0	41	43	<0.10

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B-76 0'	0	<2.0	<1.0	130	<1.0	<1.0	36	5.9	19	130	12	30	<1.0	<1.0	<1.0	35	55	<0.10
B-76 1'	1	<2.0	<1.0	97	<1.0	<1.0	31	6.1	16	8.2	11	27	<1.0	<1.0	<1.0	39	37	<0.10
B-76 2'	2	3.8	<1.0	43	<1.0	<1.0	29	8.1	17	3.3	<1.0	42	<1.0	<1.0	<1.0	34	30	<0.10
B-76 4'	4	3.5	1.9	200	<1.0	<1.0	28	4.1	15	4.4	<1.0	23	<1.0	<1.0	<1.0	31	37	<0.10
B-76 6'	6	5.9	2.7	86	<1.0	<1.0	33	7.6	21	6.8	<1.0	35	<1.0	<1.0	<1.0	44	63	<0.10
B-77 0'	0	5.0	<1.0	120	<1.0	<1.0	36	7.3	23	210	<1.0	32	<1.0	<1.0	<1.0	37	69	<0.10
B-77 1'	1	7.6	3.1	130	<1.0	<1.0	37	7.5	25	210	<1.0	34	<1.0	<1.0	<1.0	40	74	<0.10
B-77 2'	2	7.0	<1.0	85	<1.0	<1.0	34	6.9	17	5.6	<1.0	26	<1.0	<1.0	<1.0	31	51	<0.10
B-77 4'	4	<2.0	<1.0	110	<1.0	<1.0	28	6.2	18	3.4	10	24	<1.0	<1.0	<1.0	28	40	<0.10
B-77 6'	6	<2.0	1.5	100	<1.0	<1.0	25	4.8	15	2.8	10	27	<1.0	<1.0	<1.0	26	34	<0.10
B-78 0'	0	<2.0	<1.0	120	<1.0	<1.0	33	8.2	20	17	12	37	<1.0	<1.0	<1.0	33	47	<0.10
B-78 1'	1	<2.0	1.8	150	<1.0	<1.0	35	8.4	23	27	13	38	<1.0	<1.0	<1.0	35	55	0.15
B-78 2'	2	<2.0	<1.0	110	<1.0	<1.0	31	6.3	19	4.1	11	31	<1.0	<1.0	<1.0	31	37	<0.10
B-78 4'	4	<2.0	1.9	130	<1.0	<1.0	37	8.5	28	6.0	15	41	<1.0	<1.0	<1.0	37	60	<0.10
B-78 6'	6	<2.0	2.2	540	<1.0	<1.0	30	15	22	7.5	17	37	<1.0	<1.0	<1.0	37	58	<0.10
B-79 0'	0	5.0	<1.0	210	<1.0	2.4	55	8.5	77	2,700	1.7	46	<1.0	<1.0	<1.0	40	340	0.27
B-79 1'	1	2.2	<1.0	130	<1.0	1.2	38	7.7	21	25	<1.0	34	<1.0	<1.0	<1.0	41	52	<0.10
B-79 2'	2	7.6	<1.0	48	<1.0	1.9	70	23	47	2.4	<1.0	36	<1.0	<1.0	<1.0	120	47	<0.10
B-81 0'	0	<2.0	<1.0	160	<1.0	2.1	180	18	48	450	<1.0	210	<1.0	<1.0	<1.0	56	180	0.11
B-81 1'	1	<2.0	<1.0	86	<1.0	1.5	49	16	35	14	<1.0	34	<1.0	<1.0	<1.0	91	54	<0.10
B-81 2'	2	<2.0	<1.0	220	<1.0	1.5	49	15	30	8.9	<1.0	45	<1.0	<1.0	<1.0	72	56	<0.10
B-83 0'	0	<2.0	<1.0	370	<1.0	1.5	77	15	67	72	<1.0	93	<1.0	<1.0	<1.0	58	130	0.12
B-83 1'	1	<2.0	<1.0	110	<1.0	2.0	46	13	41	1,300	<1.0	50	<1.0	<1.0	<1.0	73	130	<0.10
B-83 2	2	<2.0	1.3	180	<1.0	1.2	44	8.6	22	12	<1.0	38	<1.0	<1.0	<1.0	45	61	<0.10

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B-84 0'	0	<2.0	2.1	150	<1.0	1.2	45	10	40	470	<1.0	42	<1.0	<1.0	<1.0	50	170	0.13
B-84 1'	1	<2.0	4.5	190	<1.0	<1.0	37	8.6	25	9.5	<1.0	39	<1.0	<1.0	<1.0	39	60	<0.10
B-84 2'	2	<2.0	4.3	180	<1.0	<1.0	37	8.4	24	8.0	<1.0	39	<1.0	<1.0	<1.0	42	58	<0.10
B-84 6'	6	<2.0	3.4	320	<1.0	<1.0	39	8.9	27	8.5	<1.0	41	<1.0	<1.0	<1.0	39	63	<0.10
B-84 12'	12	<2.0	4.7	89	<1.0	<1.0	28	7.3	18	6.5	<1.0	26	<1.0	<1.0	<1.0	35	49	<0.10
B-84 18'	18	<2.0	2.5	130	<1.0	<1.0	32	6.7	19	4.8	<1.0	31	<1.0	<1.0	<1.0	36	42	<0.10
B-86 0'	0	<2.0	<1.0	160	<1.0	1.7	69	12	51	490	<1.0	68	<1.0	<1.0	<1.0	53	180	0.20
B-86 1'	1	<2.0	<1.0	54	<1.0	1.6	57	21	44	150	<1.0	35	<1.0	<1.0	<1.0	100	59	0.64
B-86 2'	2	<2.0	2.3	170	<1.0	1.1	44	8.4	23	7.0	<1.0	38	<1.0	<1.0	<1.0	46	58	<0.10
B-87 0'	0	<2.0	2.7	150	<1.0	1.1	46	9.6	32	300	<1.0	40	<1.0	<1.0	<1.0	49	150	<0.10
B-87 1'	1	<2.0	3.7	190	<1.0	1.1	36	8.1	23	42	<1.0	36	<1.0	<1.0	<1.0	40	74	<0.10
B-87 12'	12	<2.0	1.1	100	<1.0	<1.0	33	5.7	17	4.5	<1.0	33	<1.0	<1.0	<1.0	27	53	<0.10
B-87 18'	18	<2.0	<1.0	88	<1.0	<1.0	31	4.5	15	4.0	<1.0	31	<1.0	<1.0	<1.0	26	45	<0.10
B-88 0'	0	<2.0	<1.0	150	<1.0	2.2	65	13	54	1,100	<1.0	55	<1.0	<1.0	<1.0	72	190	0.12
B-88 1'	1	<2.0	<1.0	75	<1.0	1.4	56	17	39	140	<1.0	36	<1.0	<1.0	<1.0	91	57	<0.10
B-88 2'	2	<2.0	2.4	250	<1.0	1.1	44	8.3	22	8.0	<1.0	37	<1.0	<1.0	<1.0	46	60	<0.10
B-90 0'	0	<2.0	<1.0	120	<1.0	1.3	50	11	28	30	<1.0	44	<1.0	<1.0	<1.0	58	51	0.19
B-90 1'	1	<2.0	<1.0	110	<1.0	1.6	52	14	35	65	<1.0	41	<1.0	<1.0	<1.0	76	62	<0.10
B-90 2'	2	<2.0	2.1	240	<1.0	1.3	49	9.2	23	7.1	<1.0	42	<1.0	<1.0	<1.0	49	59	<0.10
B-91 0'	0	<2.0	<1.0	84	<1.0	1.9	64	20	47	480	<1.0	41	<1.0	<1.0	<1.0	120	82	<0.10
B-91 1'	1	<2.0	1.4	150	<1.0	1.1	42	8.3	22	9.1	<1.0	35	<1.0	<1.0	<1.0	46	59	<0.10
B-91 2'	2	<2.0	1.6	210	<1.0	1.1	44	8.5	21	7.9	<1.0	38	<1.0	<1.0	<1.0	46	56	<0.10
B-93 0'	0	<2.0	<1.0	210	<1.0	1.7	45	11	49	530	<1.0	48	<1.0	<1.0	<1.0	57	140	0.14
B-93 1'	1	<2.0	<1.0	86	<1.0	1.3	51	17	40	160	<1.0	35	<1.0	<1.0	<1.0	85	65	<0.10
B-93 2'	2	<2.0	2.9	180	<1.0	1.2	43	11	26	18	<1.0	58	<1.0	<1.0	<1.0	46	77	0.10

TABLE 3
Summary of CAM17 Metals Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B-96 0'	0	<2.0	2.4	250	<1.0	2.2	54	13	57	1,100	<1.0	55	<1.0	<1.0	<1.0	61	260	0.12
B-96 1'	1	<2.0	<1.0	110	<1.0	1.3	51	11	34	280	<1.0	37	<1.0	<1.0	<1.0	58	81	0.22
B-96 2'	2	<2.0	2.4	170	<1.0	1.1	44	8.6	22	8.2	<1.0	38	<1.0	<1.0	<1.0	44	63	<0.10
B-99 0'	0	<2.0	<1.0	81	<1.0	1.6	51	17	48	810	<1.0	34	<1.0	<1.0	<1.0	83	230	<0.10
B-99 1'	1	<2.0	<1.0	61	<1.0	1.5	51	17	39	790	<1.0	30	<1.0	<1.0	<1.0	84	150	<0.10
B-99 2'	2	<2.0	<1.0	67	<1.0	1.5	46	16	40	820	<1.0	29	<1.0	<1.0	<1.0	81	150	<0.10
B-102 0'	0	<2.0	<1.0	170	<1.0	1.6	50	8.4	84	170	2.6	45	<1.0	<1.0	<1.0	45	350	<0.10
B-102 1'	1	<2.0	<1.0	46	<1.0	1.8	53	21	37	21	<1.0	34	<1.0	<1.0	<1.0	130	55	<0.10
B-102 2'	2	<2.0	<1.0	100	<1.0	1.5	65	18	38	11	<1.0	44	<1.0	<1.0	<1.0	88	58	<0.10
B-104 0'	0	<2.0	<1.0	64	<1.0	2.1	120	21	86	1,800	<1.0	57	<1.0	<1.0	<1.0	93	130	<0.10
B-104 1'	1	<2.0	1.9	140	<1.0	1.4	44	8.0	28	15	<1.0	37	<1.0	<1.0	<1.0	48	68	<0.10
B-104 2'	2	<2.0	2.9	250	<1.0	1.3	45	9.3	26	15	<1.0	40	<1.0	<1.0	<1.0	49	72	<0.10
B-106 0'	0	<2.0	<1.0	230	<1.0	1.6	56	13	67	1,200	<1.0	46	<1.0	<1.0	<1.0	67	160	<0.10
B-106 1'	1	<2.0	<1.0	100	<1.0	1.3	43	13	28	13	<1.0	32	<1.0	<1.0	<1.0	72	57	<0.10
B-106 2'	2	<2.0	<1.0	170	<1.0	1.2	47	9.2	22	8.6	<1.0	44	<1.0	<1.0	<1.0	47	65	0.14
B-108 0'	0	<2.0	<1.0	130	<1.0	1.1	36	9.1	30	56	<1.0	35	<1.0	<1.0	<1.0	50	65	<0.10
B-108 1'	1	<2.0	<1.0	110	<1.0	1.5	45	17	33	7.5	<1.0	36	<1.0	<1.0	<1.0	86	56	<0.10
B-108 2'	2	<2.0	1.4	180	<1.0	1.1	39	8.7	22	7.0	<1.0	39	<1.0	<1.0	<1.0	39	60	<0.10
B-110 0'	0	<2.0	<1.0	140	<1.0	1.3	40	10	26	30	<1.0	37	<1.0	<1.0	<1.0	51	66	<0.10
B-110 1'	1	<2.0	<1.0	100	<1.0	1.2	38	12	24	13	<1.0	36	<1.0	<1.0	<1.0	67	55	<0.10
B-110 2'	2	<2.0	1.3	150	<1.0	1.1	36	7.6	21	6.3	<1.0	35	<1.0	<1.0	<1.0	37	62	<0.10
B-113 0'	0	3.4	<1.0	140	<1.0	2.1	42	11	57	580	<1.0	40	<1.0	<1.0	<1.0	57	1,100	0.12
B-113 1'	1	<2.0	4.8	180	<1.0	1.2	33	6.9	26	45	<1.0	33	<1.0	<1.0	<1.0	33	130	0.11

TABLE 3
Summary of CAM17 Metals Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B-113 2'	2	<2.0	1.7	150	<1.0	1.0	31	6.8	19	8.1	<1.0	33	<1.0	<1.0	<1.0	33	60	<0.10
B-116 0'	0	2.0	<1.0	170	<1.0	1.3	36	8.6	34	75	<1.0	38	<1.0	<1.0	<1.0	38	150	<0.10
B-116 1'	1	<2.0	1.5	120	<1.0	1.2	30	7.1	25	93	<1.0	32	<1.0	<1.0	<1.0	31	140	<0.10
B-116 2'	2	<2.0	1.3	150	<1.0	1.0	29	7.0	19	14	<1.0	34	<1.0	<1.0	<1.0	30	60	<0.10
B-119 0'	0	<2.0	<1.0	140	<1.0	1.4	43	12	30	83	<1.0	47	<1.0	<1.0	<1.0	42	98	<0.10
B-119 1'	1	<2.0	<1.0	130	<1.0	1.2	36	10	24	96	<1.0	31	<1.0	<1.0	<1.0	56	88	<0.10
B-119 2'	2	<2.0	1.6	180	<1.0	1.0	33	7.3	18	6.1	<1.0	37	<1.0	<1.0	<1.0	33	57	<0.10
B-122 0'	0	<2.0	<1.0	160	<1.0	2.2	200	18	62	1,900	<1.0	290	<1.0	<1.0	<1.0	50	220	0.16
B-122 1'	1	<2.0	<1.0	170	<1.0	1.5	46	12	31	250	<1.0	44	<1.0	<1.0	<1.0	61	88	<0.10
B-122 2'	2	<2.0	<1.0	120	<1.0	1.4	42	15	28	20	<1.0	35	<1.0	<1.0	<1.0	78	57	<0.10
B-124 0'	0	<2.0	<1.0	280	<1.0	1.5	52	12	50	89	<1.0	64	<1.0	<1.0	<1.0	59	150	<0.10
B-124 1'	1	<2.0	<1.0	85	<1.0	1.3	41	14	28	8.1	<1.0	33	<1.0	<1.0	<1.0	79	64	<0.10
B-124 2'	2	<2.0	1.4	160	<1.0	1.1	37	7.7	20	6.6	<1.0	38	<1.0	<1.0	<1.0	36	59	<0.10
B-126 0'	0	<2.0	<1.0	110	<1.0	1.3	55	12	34	260	<1.0	54	<1.0	<1.0	<1.0	58	140	<0.10
B-126 1'	1	<2.0	6.2	110	<1.0	1.8	100	15	130	600	<1.0	110	<1.0	<1.0	<1.0	77	190	0.17
B-126 2'	2	<2.0	<1.0	140	<1.0	1.2	36	9.2	24	19	<1.0	36	<1.0	<1.0	<1.0	41	66	0.25
B-130 0'	0	<2.0	<1.0	60	<1.0	<1.0	16	4.4	10	15	<1.0	13	<1.0	<1.0	<1.0	24	24	<0.10
B-130 1'	1	<2.0	<1.0	89	<1.0	1.3	47	17	36	20	<1.0	34	<1.0	<1.0	<1.0	100	57	<0.10
B-130 2'	2	<2.0	<1.0	29	<1.0	<1.0	29	11	20	<5.0	<1.0	20	<1.0	<1.0	<1.0	69	28	<0.10
B-131 4'	4	7.7	4.7	150	<1.0	<1.0	26	6.8	16	5.5	<1.0	34	<1.0	<1.0	<1.0	27	55	<0.10
B-131 6'	6	6.7	3.2	130	<1.0	<1.0	27	7.5	13	4.5	<1.0	35	<1.0	<1.0	<1.0	26	41	<0.10
B-131 0'	0	<2.0	<1.0	150	<1.0	1.0	40	11	37	35	5.4	40	<1.0	<1.0	<1.0	48	62	<0.10
B-131 1'	1	<2.0	<1.0	150	<1.0	1.2	45	20	46	15	<1.0	38	<1.0	<1.0	<1.0	65	69	0.11
B-131 2'	2	<2.0	<1.0	140	<1.0	<1.0	27	5.9	17	10	<1.0	29	<1.0	<1.0	<1.0	27	53	<0.10

TABLE 3
Summary of CAM17 Metals Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B-132 0'	0	<2.0	<1.0	150	<1.0	1.6	45	10	44	910	2.5	42	<1.0	<1.0	<1.0	51	160	0.18
B-132 1'	1	<2.0	<1.0	61	<1.0	1.7	94	21	52	180	<1.0	43	<1.0	<1.0	<1.0	110	66	<0.10
B-132 2'	2	<2.0	1.0	150	<1.0	1.0	35	7.9	20	8.1	<1.0	35	<1.0	<1.0	<1.0	35	58	<0.10
B-134 0'	0	<2.0	<1.0	60	<1.0	2.0	72	22	46	140	<1.0	38	<1.0	<1.0	<1.0	120	140	<0.10
B-134 1'	1	<2.0	<1.0	40	<1.0	1.8	73	21	41	5.6	<1.0	34	<1.0	<1.0	<1.0	120	52	<0.10
B-134 2'	2	<2.0	<1.0	130	<1.0	1.2	38	11	27	20	<1.0	35	<1.0	<1.0	<1.0	46	62	<0.10
B-136 0'	0	<2.0	<1.0	92	<1.0	1.2	41	16	36	12	<1.0	35	<1.0	<1.0	<1.0	67	49	<0.10
B-136 1'	1	<2.0	<1.0	530	<1.0	<1.0	20	17	63	7.1	<1.0	44	<1.0	<1.0	<1.0	37	51	<0.10
B-136 2'	2	<2.0	<1.0	99	<1.0	1.1	53	12	26	4.0	<1.0	41	<1.0	<1.0	<1.0	62	39	<0.10
	ESLs																	
	Residential Land Use	6.3	0.39	750	4.0	1.7	750	40	230	200	40	150	10	20	1.3	16	600	1.3
	Comm/Ind Land Use	40	16	1500	8.0	7.4	750	80	230	750	40	150	10	40	16	200	600	10
	Construction Exposure	310	15	2,600	98	39	1,200,000	94	310,000	750	78	260	3,900	3,900	62	770	230,000	58

Notes:

Results are shown in milligrams per kilogram (mg/kg).

Values listed for chromium are for Chromium III, as there is no standard for total chromium.

< = Analyte was not detected above the laboratory reporting limit.

ESLs = Environmental Screening Levels, Tables A and K-3, SFRWQCB, Revised May 2008.

TABLE 4
Summary of Organics Results - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	Sample Depth (ft)	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	BTEX (ug/kg)	VOCs (ug/kg)
B-3 10'	10	<1.0	2.1	<1.0	ND	ND
B-5 10'	10	<1.0	1.7	<1.0	ND	ND
B-42 10'	10	<1.0	3.2	23	ND	ND
B-57 10'	10	<1.0	1.0	13	ND	ND
B-58 10'	10	<1.0	<1.0	12	ND	ND
B-61 10'	10	<1.0	<1.0	6.0	ND	ND
B-94 10'	10	<1.0	4.1	<1.0	ND	ND
B-128 10'	10	<1.0	<1.0	1.2	ND	ND
B-129 10'	10	<1.0	5.8	2.9	ND	ND
	ESLs					
	Residential	83	83	370	---	---
	Commercial/Industrial	83	83	2,500	---	---
	Construction Exposure	4,200	4,200	12,000	---	---

Notes:
mg/kg = milligrams per kilogram
TPHg = Total Petroleum Hydrocarbons as gasoline
TPHd = Total Petroleum Hydrocarbons as diesel
TPHmo = Total Petroleum Hydrocarbons as motor oil
--- = Not Analyzed or Not Applicable
< = Not detected above the stated laboratory reporting limit
ESLs = Environmental Screening Levels, Tables A and K-3, SFRWQCB, Revised May 2008.
ug/kg = microgram per kilogram
BTEX = Benzene, toluene, ethylbenzene, and xylenes
VOCs = Volatile organic compounds

TABLE 5
Summary of Grab-Groundwater Sample Results
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Sample ID	TPHg	TPHd	TPHmo	BTEX	Other VOCs
B-17	<0.050	<0.050	<0.050	ND	ND
B-19	<0.050	<0.050	<0.050	ND	ND
B-75	<0.050	<0.050	<0.062	ND	4-isopropyltoluene=0.82
B-84	<0.050	<0.050	<0.050	ND	ND
ESLs					
GW is current/potential source	100	100	100	---	---
GW not current/potential source	2,100	2,100	2,100	---	---
Surface Water - Freshwater	100	100	100	---	---
Surface Water - Marine	2,100	2,100	2,100	---	---
Surface Water - Estuarine	2,100	2,100	2,100	---	---

Notes:

Data are shown in units of mucrograms per liter (µg/l).

TPHg = Total Petroleum Hydrocarbons as gasoline

TPHd = Total Petroleum Hydrocarbons as diesel

TPHmo = Total Petroleum Hydrocarbons as motor oil

--- = Not Analyzed or Not Applicable

<

ESLs = Environmental Screening Levels, Tables A, B, & F, SFRWQCB, Revised May 2008.

BTEX = Benzene, toluene, ethylbenzene, and xylenes

VOCs = Volatile organic compounds

TABLE 6a
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Northbound
Borings B1 to B67

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	551.7	588.5
1.0 to 1.5 ft	372.3	398.2
2.0 to 2.5 ft	62.9	69.7

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	552	25	589
Underlying Soil (1.0 to 2.5 ft.)	*269*	*12*	*289*
0 to 2.0 ft	462	21	493
Underlying Soil (2.0 to 2.5 ft)	*63*	*2.9*	*70*
0 to 2.5 ft	382	18	409

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line,
where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6b
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Northbound excluding borings at Willow Road (B-26 to B-31)
and University Avenue (B-43 to B-52) Overcorssings
Borings B-1 to B-25, B-32 to B-42 and B-53 to B-67

TOTAL LEAD

	UCLs (mg/kg)	
	90% UCL	95% UCL
0 to 0.5 ft	329.3	349.9
1.0 to 1.5 ft	431.3	468.1
2.0 to 2.5 ft	79.2	85.8

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	329	15	350
Underlying Soil (1.0 to 2.5 ft.)	*314*	*14*	*341*
0 to 2.0 ft	380	17	409
Underlying Soil (2.0 to 2.5 ft)	*79*	*3.6*	*86*
0 to 2.5 ft	320	15	344

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line,
where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6c
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Northbound excluding borings at Willow Road Overcorssing (B-26 to B-31)
Borings B-1 to B-25 and B-32 to B-67

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	431.8	463.9
1.0 to 1.5 ft	394.5	423.6
2.0 to 2.5 ft	68.3	72.9

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	432	20	464
Underlying Soil (1.0 to 2.5 ft.)	*286*	*13*	*307*
0 to 2.0 ft	413	19	444
Underlying Soil (2.0 to 2.5 ft)	*68*	*3.1*	*73*
0 to 2.5 ft	344	16	370

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6d
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Northbound at Willow Road Overcrossing
Borings B-26 to B-31

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	2,274	2,547
1.0 to 1.5 ft	108.8	116.3
2.0 to 2.5 ft	23.0	24.6

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	2,274	105	2,547
Underlying Soil (1.0 to 2.5 ft.)	*80*	*3.7*	*86*
0 to 2.0 ft	1,191	55	1,332
Underlying Soil (2.0 to 2.5 ft)	*23*	*1.1*	*25*
0 to 2.5 ft	958	44	1,070

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line,
where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046\ x$

TABLE 6e
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Northbound excluding borings at University Avenue Overcrossing (B-43 to B-52)
Borings B-1 to B-42 and B-53 to B-67

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	502	536.6
1.0 to 1.5 ft	392.3	426.8
2.0 to 2.5 ft	72.2	78.8

EXCAVATION SCENARIOS

Excavation Depth	Weighted Averages 90% UCL Total Lead (mg/kg)	90% UCL Soluble (WET) Lead* (mg/l)	95% UCL Total Lead (mg/kg)
0 to 1.0 ft	502	23	537
Underlying Soil (1.0 to 2.5 ft.)	*286*	*13*	*311*
0 to 2.0 ft	447	21	482
Underlying Soil (2.0 to 2.5 ft)	*72*	*3.3*	*79*
0 to 2.5 ft	372	17	401

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 \; x$

TABLE 6f
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Northbound at University Avenue Overcrossing
Borings B-43 to B-52

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	1,202	1,374
1.0 to 1.5 ft	346.1	382.4
2.0 to 2.5 ft	16.2	18.0

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	1,202	55	1,374
Underlying Soil (1.0 to 2.5 ft.)	*236*	*11*	*261*
0 to 2.0 ft	774	36	878
Underlying Soil (2.0 to 2.5 ft)	*16*	*0.74*	*18*
0 to 2.5 ft	622	29	706

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6g
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Southbound
Borings B68 to B137

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	649.7	683.5
1.0 to 1.5 ft	227.1	240.9
2.0 to 2.5 ft	70.8	78.2

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	650	30	684
Underlying Soil (1.0 to 2.5 ft.)	*175*	*8.0*	*187*
0 to 2.0 ft	438	20	462
Underlying Soil (2.0 to 2.5 ft)	*71*	*3.3*	*78*
0 to 2.5 ft	365	17	385

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6h
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Southbound excluding borings at Willow Road (B-98 to B-101)
and University Avenue (B-113 to B-121) Overcorssings
Borings B-68 to B-97, B-102 to B-111 and B-122 to B-137

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	585.4	615.2
1.0 to 1.5 ft	242.1	258.8
2.0 to 2.5 ft	87.3	101.1

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1.0 ft	585	27	615
Underlying Soil (1.0 to 2.5 ft.)	*191*	*8.8*	*206*
0 to 2.0 ft	414	19	437
Underlying Soil (2.0 to 2.5 ft)	*87*	*4.0*	*101*
0 to 2.5 ft	348	16	370

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6i
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Southbound excluding borings at Willow Road Overcrossing (B-98 to B-101)
Borings B-68 to B-97 and B-102 to B-137

TOTAL LEAD

	UCLs (mg/kg)	
	90% UCL	95% UCL
0 to 0.5 ft	549.9	577
1.0 to 1.5 ft	219.5	231.8
2.0 to 2.5 ft	76.3	86.6

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	550	25	577
Underlying Soil (1.0 to 2.5 ft.)	*172*	*7.9*	*183*
0 to 2.0 ft	385	18	404
Underlying Soil (2.0 to 2.5 ft)	*76*	*3.5*	*87*
0 to 2.5 ft	323	15	341

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6j
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Southbound at Willow Road Overcrossing
Borings B-98 to B-101

TOTAL LEAD

	Maximums (mg/kg)
0 to 0.5 ft	5,300
1.0 to 1.5 ft	790
2.0 to 2.5 ft	820

EXCAVATION SCENARIOS

	Weighted Averages	
	Maximum	
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)
0 to 1.0 ft	5,300	244
Underlying Soil (1.0 to 2.5 ft.)	*800*	*37*
0 to 2.0 ft	3,045	140
Underlying Soil (2.0 to 2.5 ft)	*820*	*38*
0 to 2.5 ft	2,600	120

Notes:

Maximum concentrations used because data set consists of four or less unique values.
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 \quad x$

TABLE 6k
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Southbound excluding borings at University Avenue Overcrossing (B-113 to B-121)
Borings B-68 to B111 and B-122 to B-137

TOTAL LEAD

	UCLs (mg/kg)	
	90% UCL	**95% UCL**
0 to 0.5 ft	699.6	742.7
1.0 to 1.5 ft	256.3	267
2.0 to 2.5 ft	101	114.5

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**Soluble (WET) Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1.0 ft	700	32	743
Underlying Soil (1.0 to 2.5 ft.)	*205*	*9.4*	*216*
0 to 2.0 ft	478	22	505
Underlying Soil (2.0 to 2.5 ft)	*101*	*4.6*	*115*
0 to 2.5 ft	403	19	427

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line,
where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6l
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Southbound at University Avenue Overcrossing
Borings B-113 to B-121

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	496.1	547.6
1.0 to 1.5 ft	62.3	66.7
2.0 to 2.5 ft	9.0	9.3

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	496	23	548
Underlying Soil (1.0 to 2.5 ft.)	*45*	*2.0*	*48*
0 to 2.0 ft	279	13	307
Underlying Soil (2.0 to 2.5 ft)	*9.0*	*0.41*	*9.3*
0 to 2.5 ft	225	10	248

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046\ x$

TABLE 6m
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Northbound - Marsh Road to University Avenue
Borings B1 to B48

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	626.8	667.1
1.0 to 1.5 ft	257.1	275.3
2.0 to 2.5 ft	57.5	62.0

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	627	29	667
Underlying Soil (1.0 to 2.5 ft.)	*191*	*8.8*	*204*
0 to 2.0 ft	442	20	471
Underlying Soil (2.0 to 2.5 ft)	*57*	*2.6*	*62*
0 to 2.5 ft	365	17	389

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046\ x$

TABLE 6n
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Northbound - University Avenue to Embarcadero
Borings B-49 to B-67

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	492.6	538.0
1.0 to 1.5 ft	760.3	839.5
2.0 to 2.5 ft	106	122.7

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	493	23	538
Underlying Soil (1.0 to 2.5 ft.)	*542*	*25*	*601*
0 to 2.0 ft	626	29	689
Underlying Soil (2.0 to 2.5 ft)	*106*	*4.9*	*123*
0 to 2.5 ft	522	24	576

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line,
where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046\ x$

TABLE 6o
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Southbound - Marsh Road to University Avenue
Borings B-68 to B-137

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	705.3	753
1.0 to 1.5 ft	236.3	252
2.0 to 2.5 ft	123.8	139.1

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	705	32	753
Underlying Soil (1.0 to 2.5 ft.)	*199*	*9.1*	*214*
0 to 2.0 ft	471	22	503
Underlying Soil (2.0 to 2.5 ft)	*124*	*5.7*	*139*
0 to 2.5 ft	401	18	430

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line,
where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

TABLE 6p
Summary of Lead Statistical Analysis - Soil
Highway 101 Auxiliary Lane Addition Project
Santa Clara and San Mateo Counties, California

Highway 101 Southbound - University Avenue to Embarcadero
Borings B-117 to B-137

TOTAL LEAD

	UCLs (mg/kg) 90% UCL	95% UCL
0 to 0.5 ft	648.1	690.9
1.0 to 1.5 ft	264.8	287.7
2.0 to 2.5 ft	11.8	12.3

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	Total Lead (mg/kg)	Soluble (WET) Lead* (mg/l)	Total Lead (mg/kg)
0 to 1.0 ft	648	30	691
Underlying Soil (1.0 to 2.5 ft.)	*180*	*8.3*	*196*
0 to 2.0 ft	456	21	489
Underlying Soil (2.0 to 2.5 ft)	*12*	*0.54*	*12*
0 to 2.5 ft	368	17	394

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
Weighted average values are based upon calculated UCLs for each depth interval.
* = Soluble (WET) lead concentrations are predicted using slope of regression line, where y = predicted soluble (WET) lead and x = total lead.

Regression Line Slope: $y = 0.046 x$

APPENDIX A

City of Menlo Park 701 Laurel Street
Menlo Park, CA 94025
Engineering Division
Phone:(650) 330-6740

Permit No.: ECR2009-00165
Issued: 8/5/2009

Keep Permit at work site

ENCROACHMENT PERMIT

Call for Inspections

[ ] Curb & Gutter Permit
[X] Sidewalk, Driveway Permit
[ ] Street Opening Permit
[ ] Debris Box
[ ] Other:

ONE PERMIT PER ADDRESS

Name of Applicant (person)	Representing	Location of work				
JOHN LOVE	[X] Owner	Van Buren Road and Pierce Road.				
Name of Owner	**Address**		**City**	**State**	**Zip**	**Telephone**
Name of Contractor	**Address**		**City**	**State**	**Zip**	**Telephone**
GEOCON CONSULTANTS	6671 BRISA STREET		LIVERMORE	CA	94550	925-371-5900
CA Contractor License No	**Menlo Park Business License No**		**Est. Start Date**		**Est. Completion Date**	
Estimated Construction Cost (Estimate work in city R/W only. Do not include value of utility.) $5,000.00			**Insurance provided by**			

Description of work to be done:

Advance 4 temporary soil borings in public right of way. Conditions: Notify neighbors 72 hours before work is to begin. Include work schedule.

Call Underground Service Alert (USA) at 1-800-227-2600 before you dig

GENERAL CONDITIONS OF PERMIT: (See attached sheet)

I hereby acknowledge that I have read this permit and the attached conditions, that the information given by me is correct, that I am the owner or the duly authorized agent of the owner, and that I agree to comply with the conditions and all applicable provisions of state laws, city ordinances, and the rules of any governmental agency involved.

On File

Signature of Applicant (Owner or authorized agent) — Title — Date

Approved by Director of Engineering Services	Date	Permit expires	Fees (retained by city)	$400.00
Approved by:	8/5/09	11/5/2009		
Approved by Transportation Manager	**Date**		**Deposit** (refundable)	PAID
Approved by:				
			Total due to City	JUL 27 2009

CITY OF MENLO PAF

GENERAL CONDITIONS OF PERMIT

City of Menlo Park 701 Laurel Street Menlo Park, CA 94025
Engineering Division

Phone:(650) 330-6740

Permit No.: ECR2009-00165

1. This permit, regardless of when dated, shall not be in effect until the applicant has obtained all licenses and other permits required by law.
2. This permit is declared null and void if work has not begun three (3) months after the date of application and shall expire on ________________________.
3. Any damages to existing facilities and improvements above ground or below ground, shall be promptly repaired or replaced at the permittee's expense, and claims for damage to City property must be promptly paid.
4. The City of Menlo Park shall not be responsible for exact locations or depths of existing utilities or other facilities.
5. The permittee shall be responsible and liable for, and shall hold the City and its Commissions, Boards, Officers, and employees free and harmless from all liens and claims involving personal injury or property damage of any kind due, directly, or indirectly, to said permittee's operations and use of City's lands herein described.
6. All work shall comply with the City Standards including safety precautions (warning signs, barricades, lights) site restoration, and clean-up shall be done by a licensed and insured contractor.
7. Street Opening, Sidewalk, Curb and Gutter, and Driveway Permits. The Construction Supervisor shall be notified at least 24 hours prior to beginning work and 24 hours prior to each inspection. The number and type of inspections required, and any tests that may be required will be as directed by the Construction Supervisor. The Construction Supervisor may be contacted by calling (650) 330-6740, and shall also be notified 24 hours prior to concrete pour.
8. Construction activities are restricted to the weekdays between 8:00 AM and 6:00 PM.

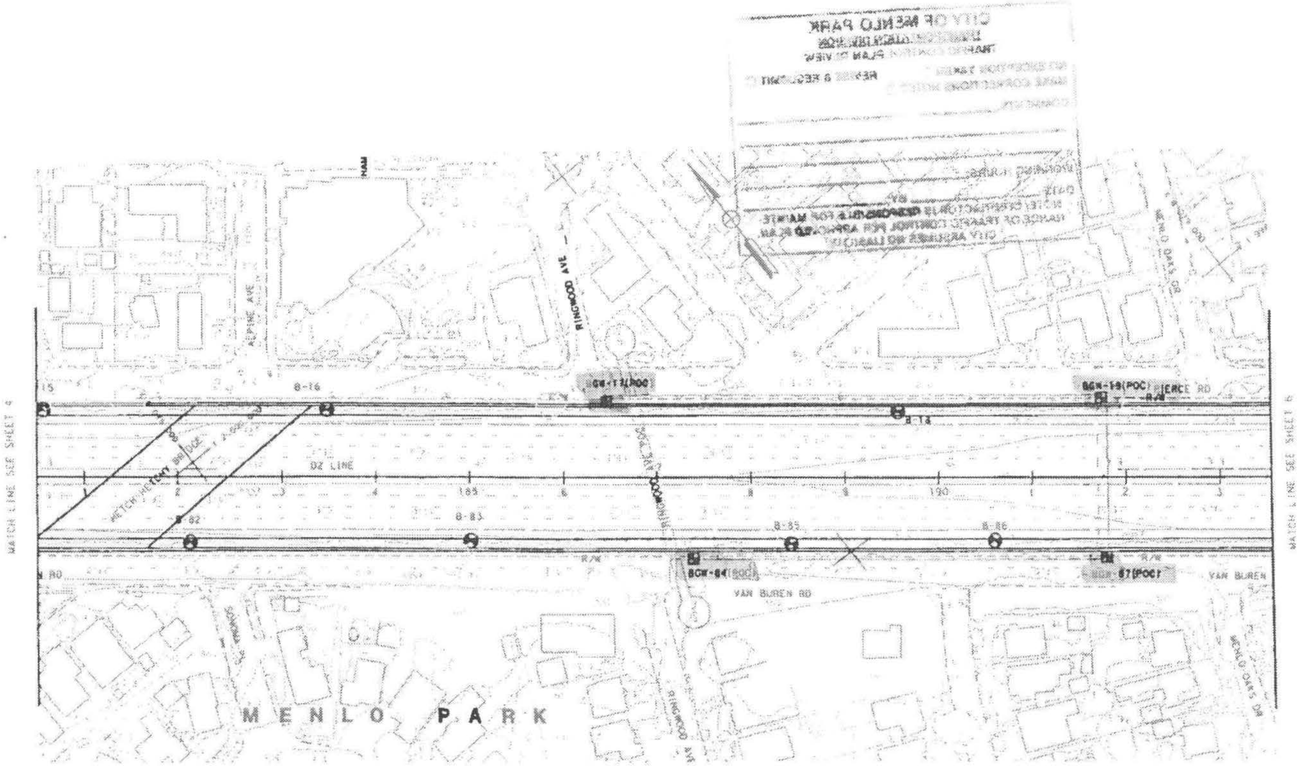
SPECIAL CONDITIONS

- [x] This grant of permission does not constitute a deed or grant of any easement by the City, is not transferable or assignable and is revocable at any time at the will of the City.
- [x] This permit does not authorize tree trimming or tree removal.
- [x] Obtain permit from City for traffic lane closure.
- [x] The use of City property by permittee shall be limited to the purposes set forth by this permit and no structures of any kind, except those expressly permitted shall be erected or placed thereon.

ADDITIONAL CONDITIONS

Conditions: Notify neighbors 72 hours before work is to begin. Include work schedule. Maintain pedestrian and bycyclist safety at all times.

TRANSPORTATION CONTROL PLAN



Soil Boring Location Map

ATTACHMENT B
SHEET 5 OF 17
SM 101 PM 0.0/3.6
SCL PM 52.2/52.6

Project Name:______________________

Project Location: Van Buren Rd

City Inspector:______________________

Purpose of Work: Advance Soil Boring
(This traffic control plan is valid for this function only!)

Working Hours: 9:00 a.m. to 3:00 p.m.
(contractor must request working hour extension in writing to the Transportation Manager).

Duration of Work: From ____ to _____
(contractor must request working hour extension in writing to the Transportation Manager).

Contractor Name: Geocon Consultants, Inc

Foreman Name: John Love

Foreman Cell Number: 925-525-9447

Emergency Number: 925-371-5900

Contractor shall not start work until inspector approves the traffic control in the field. Call 650.330.6740

SPECIAL INSTRUCTIONS

____
____
____
____
____

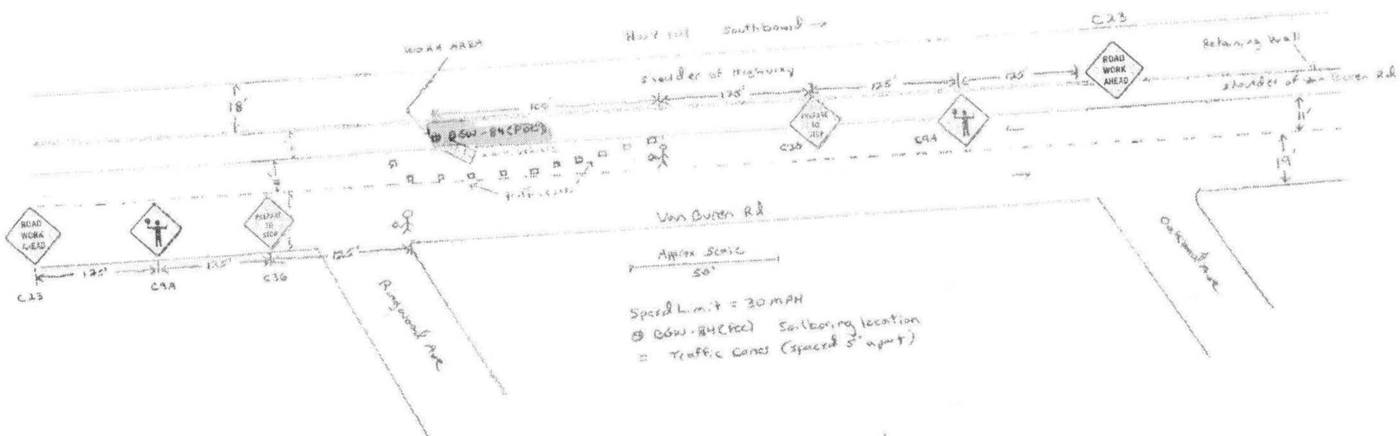
Reviewed by ___________ Date__________

Revised by ___________Date__________

TRANSPORTATION CONTROL PLAN

Sheet 2 of 5

Traffic Control Plan
for Sample Location BGW-84 (PCC)



CITY OF MENLO PARK
TRANSPORTATION DIVISION
TRAFFIC CONTROL PLAN REVIEW

NO EXCEPTION TAKEN ☒ REVISE & RESUBMIT ☐
MAKE CORRECTIONS NOTED ☐

COMMENTS: ______

WORKING HOURS: ______

DATE: 6/5/07 BY: ______

NOTE: CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC CONTROL PER APPROVED PLAN. CITY ASSUMES NO LIABILITY.

Project Name: Caltrans Hwy 101 Widening

Project Location: Van Buren Rd near Ringwood Ave

City Inspector: ______

Purpose of Work: Advance Soil Boring
(This traffic control plan is valid for this function only!)

Working Hours: 9:00 a.m. to 3:00 p.m.
(contractor must request working hour extension in writing to the Transportation Manager).

Duration of Work: From ____ to ____
(contractor must request working hour extension in writing to the Transportation Manager).

Contractor Name: Geocon Consultants

Foreman Name: John Love

Foreman Cell Number: 925 525 4142

Emergency Number: 925-371-5900

Contractor shall not start work until inspector approves the traffic control in the field. Call 650.330.6740

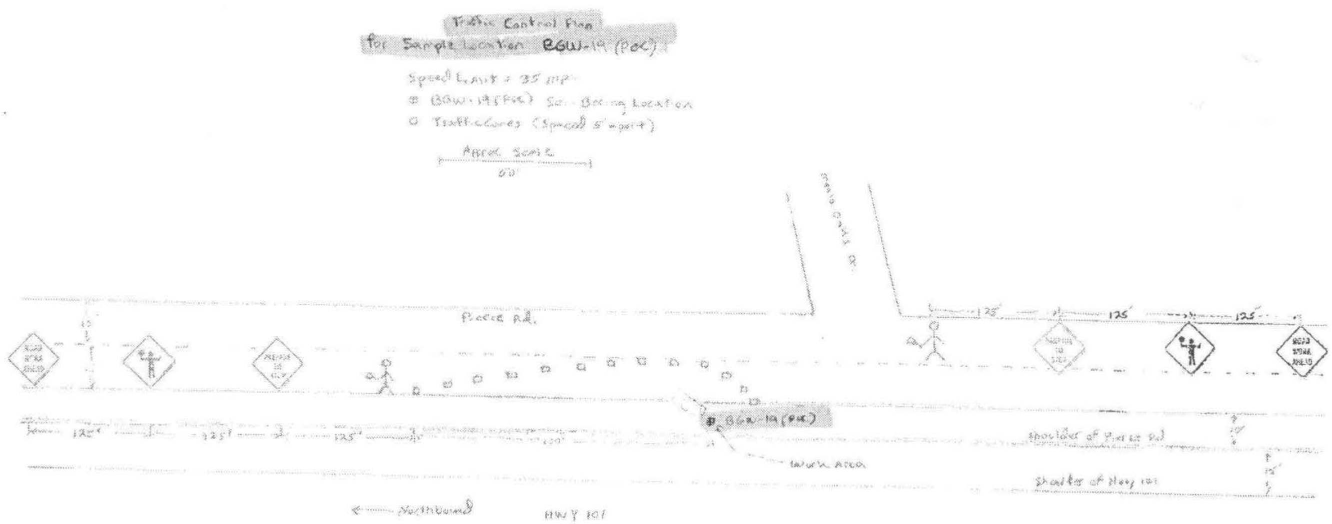
SPECIAL INSTRUCTIONS

______

Reviewed by ______ Date ______

Revised by ______ Date ______

TRANSPORTATION CONTROL PLAN



CITY OF MENLO PARK
TRANSPORTATION DIVISION
TRAFFIC CONTROL PLAN REVIEW

NO EXCEPTION TAKEN ☐ REVISE & RESUBMIT ☐
MAKE CORRECTIONS NOTED ☐

COMMENTS:____________________

WORKING HOURS:____________________

DATE__________ BY:__________

NOTE: CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC CONTROL PER APPROVED PLAN. CITY ASSUMES NO LIABILITY.

Project Name: Caltrans - Hwy 101 Widening

Project Location: Pierce Rd. near Menlo Oaks Dr

City Inspector: __________

Purpose of Work: Advance Soil Boring
(This traffic control plan is valid for this function only!)

Working Hours: 9:00 a.m. to 3:00 p.m. (contractor must request working hour extension in writing to the Transportation Manager).

Duration of Work: From ____ to ____ (contractor must request working hour extension in writing to the Transportation Manager).

Contractor Name: Geocon Consultants

Foreman Name: John Love

Foreman Cell Number: 925-525-4147

Emergency Number: 925-371-5900

Contractor shall not start work until inspector approves the traffic control in the field. Call 650.330.6740

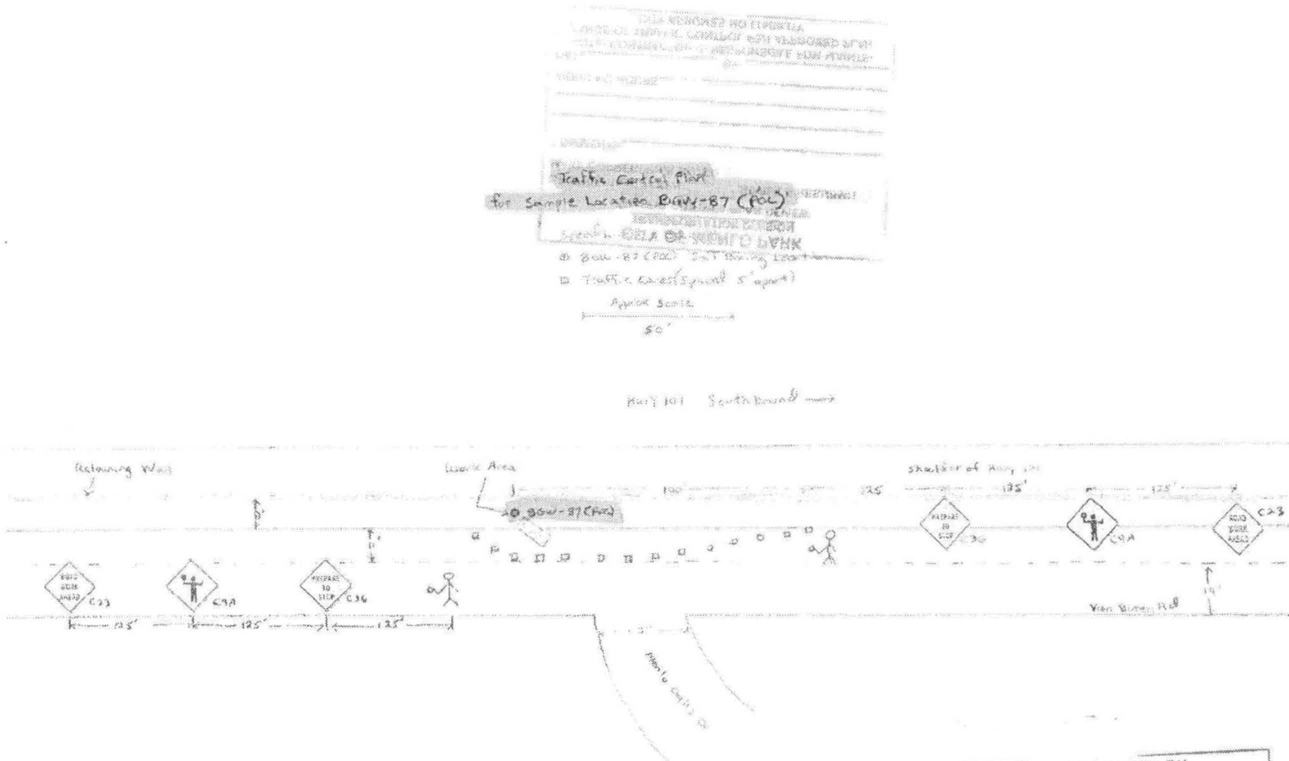
SPECIAL INSTRUCTIONS

____

Reviewed by __________ Date__________

Revised by __________ Date__________

TRANSPORTATION CONTROL PLAN



CITY OF MENLO PARK
TRANSPORTATION DIVISION
PLAN REVIEW
NO EXCEPTIONS
MAKE CORRECTIONS NOTED ✓
REVISE & RESUBMIT ☐
COMMENTS: __________
WORKING HOURS: __________
DATE: 7/29/09 BY: __________
NOTE: CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC CONTROL PER APPROVED PLAN. CITY ASSUMES NO LIABILITY.

Project Name: Caltrans ... drilling

Project Location: Van Buren Rd. near Menlo Oaks Dr

City Inspector: __________

Purpose of Work: Advance Soil Boring
(This traffic control plan is valid for this function only!)

Working Hours: 9:00 a.m. to 3:00 p.m. (contractor must request working hour extension in writing to the Transportation Manager).

Duration of Work: From ____ to _____ (contractor must request working hour extension in writing to the Transportation Manager).

Contractor Name: Geocon Consultants

Foreman Name: John Love

Foreman Cell Number: 925·525·4147

Emergency Number: 925-371-5900

Contractor shall not start work until inspector approves the traffic control in the field. Call 650.330.6740

SPECIAL INSTRUCTIONS

____

Reviewed by __________ Date __________

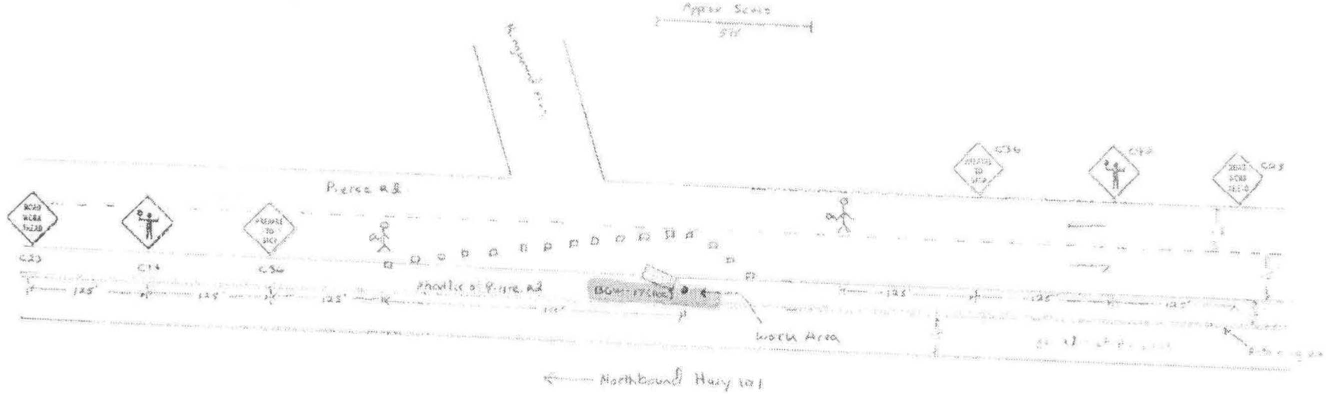
Revised by __________ Date __________

TRANSPORTATION CONTROL PLAN

Traffic Control Plan
for Sample Location BGW-17(PLC)

Speed Limit = 35 mph
BGW-17(PLC) Soil Boring Location
Traffic Cones (spaced 5' apart)

Approx Scale
5ft



CITY OF MENLO PARK
TRANSPORTATION DIVISION
TRAFFIC CONTROL PLAN REVIEW
NO EXCEPTION TAKEN ☒ REVISE & RESUBMIT ☐
MAKE CORRECTIONS NOTED ☐
COMMENTS:

WORKING HOURS:
DATE ________ BY: ________
NOTE: CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC CONTROL PER APPROVED PLAN. CITY ASSUMES NO LIABILITY.

Project Name: [illegible]

Project Location: Pierce Rd near Rosewood Ave.

City Inspector: ____________

Purpose of Work: Advance Soil Boring
(This traffic control plan is valid for this function only!)

Working Hours: 9:00 a.m. to 3:00 p.m. (contractor must request working hour extension in writing to the Transportation Manager).

Duration of Work: From ____ to ____ (contractor must request working hour extension in writing to the Transportation Manager).

Contractor Name: Geocon Consultants

Foreman Name: John Love

Foreman Cell Number: 925-525-4142

Emergency Number: 925-371-5900

Contractor shall not start work until inspector approves the traffic control in the field. Call 650.330.6740

SPECIAL INSTRUCTIONS

Reviewed by ____________ Date ____________

Revised by ____________ Date ____________

ORDINANCE: 04023

ENVIRONMENTAL HEALTH
SAN MATEO COUNTY

Protecting Our Health and Environment

PERMIT 09- 1469

P/E: 2010 MONITORING WELLS - INSTALLATION/DESTRUCTION

FACILITY:
ADJ TO HWY 101, MENLO PARK

OWNER:
CALTRANS-DISTRICT 4
111 GRAND AVENUE, MS8C
OAKLAND

WP0007720
NO APN LISTED
AMOUNT PAID: 544.00

CONTRACTOR:
VIRONEX, INC

TERMS & CONDITIONS:

CONSTRUCT SOIL BORINGS (13)
CONSULTANT: GEOCON CONSULTANTS, INC
(JOHN LOVE)

COUNTY OF SAN MATEO
FOUNDED 1856

DENO MILANO
ENVIRONMENTAL HEALTH SPECIALIST

DATE ISSUED: 8/19/2009

EXPIRATION DATE: 12/19/2009

THIS PERMIT IS NONTRANSFERABLE AND MUST BE POSTED ON-SITE IN A CONSPICUOUS PLACE

2009 SUBSURFACE DRILLING PERMIT APPLICATION

ENVIRONMENTAL HEALTH SERVICES DIVISION

SAN MATEO COUNTY HEALTH DEPARTMENT
2000 ALAMEDA DE LAS PULGAS, SUITE 100, SAN MATEO CA 94403
VOICE (650) 372-6200 FAX (650) 627-8244

SAN MATEO COUNTY ENVIRONMENTAL HEALTH
AUG 1 2 2009
RECEIVED

$544.00
#49692

ALLOW FIVE (5) WORKING DAYS FOR PROCESSING PERMIT

Fees: $544 (env/wells) and $340 (geo borings only)

DRILLING DATE & TIME MUST BE SCHEDULED WITH COUNTY STAFF AT LEAST THREE (3) WORKING DAYS IN ADVANCE

PURPOSE OF APPLICATION ☐ GROUNDWATER MONITORING WELL INSTALLATION/DESTRUCTION ☐ CONSTRUCT SOIL BORINGS ☐ VAPOR WELL INSTALLATION/DESTRUCTION ☐ PERMIT EXTENSION OF PERMIT #MW______

NO. OF WELLS ______ NO. OF BORINGS 13 WELL/BORING NAMES BGW-17(POC), BGW-19, BGW-84(POC), BGW-87(POC), B-3(GW), B-5(GW), B-42(GW), B-57(GW), B-58(GW), B-61(GW), B-94(GW), B-128(GW), B-129(GW)

PURPOSE OF DRILLING ☒ ENVIRONMENTAL ☐ GEOTECHNICAL

REQUIRED BY ☐ COUNTY GROUNDWATER PROTECTION PROGRAM ☐ RWQCB/DTSC/USEPA (Provide approval letter) ☒ OTHER (i.e. voluntary)

Site Name Adj. to Hwy 101 Assessor's Parcel # NA (one per permit)
Drilling Location Address Hwy 101 between Marsh Rd + Embarcadero Rd. City Menlo Park
To Be Constructed In: ☒ Public Property ☐ Private Property ☐ Refuse ☐ Other______
Maximum Proposed Depth Wells/Borings 18 (feet) Drilling Method Direct Push
Boring Diameter 2" Casing Diameter ______ Screen Interval ______
Development Method ______ (additional 72 hour staff notification required)
Destruction Method (6 gallons water max per 94 lb cement, up to 5% bentonite): ☐ Pressure grouting (provide well construction logs) ☐ Overdrilling

WELL/BORING OWNER: (WELL/BORING OWNER NAME OR CONTACT NAME SHOULD MATCH SIGNATURE)

Name Caltrans - District 4 Contact Person Ana Uribe
Address 111 Grand Ave, MS 8C City, State, ZIP Oakland, CA 94623
Telephone (510) 286-4914 Email ana_m_uribe@dot.ca.gov

It is my responsibility to notify the County of any known changes in the purpose of this well/boring from that which is indicated on this application. It is my responsibility to notify the County of any known damage to the well, and to maintain the well in good condition. (*Letter signed by well/boring owner/contact person, containing above language and attesting to knowledge of all permit requirements and conditions, may be substituted for signature on permit application.*)

Well/Boring Owner's/Contact Person's Signature Ana Maria Uribe Date 08/10/09

PROPERTY OWNER: (NAME AS APPEARS ON ASSESSOR'S ROLES SHOULD MATCH SIGNATURE)

Name Caltrans - District 4 Contact Person Ana Uribe
Address 111 Grand Ave, MS 8C City, State, ZIP Oakland, CA 94623
Telephone (510) 286-4914 Email ana_uribe@dot.ca.gov

I understand that a well/boring is being installed on my property. I agree to notify the County and Well Owner of any known damage to the well. (*Letter signed by property owner, containing above language, or encroachment permit may be substituted for signature on permit application.*)

Property Owner's Signature Ana Maria Uribe Date 08/10/09

Drilling Company: Vironex, Inc. Contact Person ~~John~~ Angela Damanti
Address: 5292 Pacheco Blvd. C57 Drillers License # 705927
City, State, ZIP Pacheco, CA 94553 Telephone/Email 925-521-1490/

I certify that the well/boring will be constructed in compliance with the conditions of this permit (see reverse), the San Mateo County Ordinance, and the State Water Well Standards, and that the license listed above is considered current and active by the Contractors State License Board.

Driller's Signature See attached page **Date** ______

Consultant Company: Geocon Consultants, Inc Project Manager John Love
Address: 6671 Brisa St. Telephone (925) 371-5900
City, State, ZIP Livermore, CA 94550 Email love@geoconinc.com

I certify that this application is correct to the best of my knowledge. I certify the well/boring will be constructed/destroyed in compliance with the conditions of this permit (see reverse), the San Mateo County Ordinance, and the State Water Well Standards. I understand that I am responsible for General Conditions "D and E" of this permit. I certify if I indicated the purpose of drilling is geotechnical, then no one will use the boring to collect any samples for environmental analyses. (*Responsible Professional must be a California Professional Geologist or Civil Engineer.*)

Responsible Professional's Name (Please print legibly) John Love

Responsible Professional's Signature [signature] **Date** 8/10/09

California Professional Geologist (PG) No. 6315 **or Civil Engineer No.** ______

Please see additional pages of application for requirements, general permit conditions, instructions, and fees

Revised every January 1

REQUIREMENTS:

An accurate & correct map of existing and proposed well/boring locations **must** be included with the permit application. The well/boring location map **must** include the following.

1. North arrow, existing & historic site features, wells, approximate property lines and any other pertinent existing & historic features and information.
2. Proposed well/boring locations to scale.

A work plan describing the drilling and construction/destruction methodology, at a minimum, is **required** by County Staff. Upon review of information on this application and the submitted work plan, and subject to approval noted below, a permit will be issued allowing well/boring owner, driller, and responsible professional (consultant) to perform the specified work. The permit is subject to both General and Special Conditions stated below. A copy of the approved Subsurface Drilling Permit **must** be available on site while work related to the permit is being performed. Drilling date and time **must** be scheduled with County staff at least three (3) working days in advance of field work. Drilling may begin at the notified date and time whether County staff is present or not.

GENERAL CONDITIONS:

A. Well and boring construction and destruction under this permit is subject to the Standards for the Construction of Wells in San Mateo County, County Groundwater Protection Program (GPP) Guidelines, Policies & Procedures, the State Water Well Standards, and any instructions by a Health Department representative.

B. Well/Boring Owner, Driller, and Responsible Professional assume responsibility for all activities and uses under the permit, including compliance with Workmen's Compensation Laws, and indemnify, defend and save the County of San Mateo, its' officers, agents and employees, free and harmless from any and all expense, cost, or liability in connection with or resulting from work or stopped-work associated with the permit, including, but not limited to, property damage, personal injury, wrongful death, and loss of income.

C. All borings **must** be properly destroyed (grouted/sealed) within 24 hours of drilling unless special conditions are approved in writing as part of this permit.

D. Analytical results of all soil and groundwater samples collected during the execution of drilling under this permit **must** be submitted to County GPP staff by the Responsible Professional within 60 days of sample collection. If contamination is discovered during drilling, verbal notification to County GPP by the Responsible Professional is **required** within 72 hours of discovery. Proper storage, labeling & disposal of investigation-derived residual wastes are the responsibility of the consultant unless stated otherwise contractually.

E. In addition to the County copy of the State DWR Form 188, boring logs and well construction details for all borings/wells except geotechnical borings, signed by a Responsible Professional, **must** be submitted to County GPP by the Responsible Professional within 60 days of drilling/construction/destruction. As-built locations/dimensions **must** be finalized in subsequent report of findings submitted to County GPP by the Responsible Professional within 60 days of drilling/construction/destruction.

F. Permit is valid only for the purpose specified herein. No change in construction procedure, as described on this permit application, in the associated workplan, or in the special conditions below, will be allowed except upon written permission from the County.

G. Permit is valid for one mobilization only and is automatically canceled if not exercised, or if an extension is not applied for and granted by County GPP, within 120 days of the original permit issuance date. Failure to notify staff of cancellation or delay in start time, at least one minute prior to notified start time, will result in the Consultant will be billed an Inspection Cancellation fee of $249 for 2009 if GPP staff attempted to perform an inspection.

H. Wells installed under this permit may not be used for domestic, municipal, commercial, or irrigation water supply.

I. All work plans and reports related to work performed under County oversight **must** conform to County GPP guidelines, Regional Water Quality Control Board guidelines, and State Water Well Standards.

J. Top-of-casing elevation of all wells **must** be surveyed to the nearest 0.01-foot relative to Mean Sea Level (NAVD88) and submitted to County GPP within 60 days of drilling, and to State GeoTracker as appropriate.

K. Latitude and longitude of all wells **must** be surveyed with sub-meter accuracy relative to NAD83 and submitted to County GPP within 60 days of drilling, and to State GeoTracker as appropriate.

L. Violation of any requirement or general or special permit condition may result in an order by GPP staff to cease work under this permit, correct the violation, and potentially re-permit the work as a new mobilization.

SPECIAL CONDITIONS:______________________________

Approved: [signature] RO/SD#__________ Date: 8.13.09

Revised every January 1

APPENDIX B

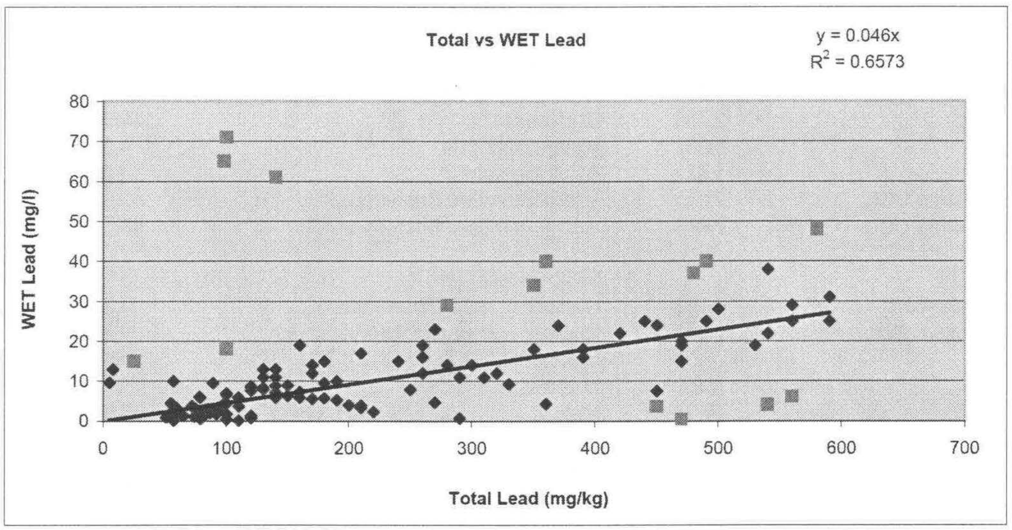
APPENDIX C

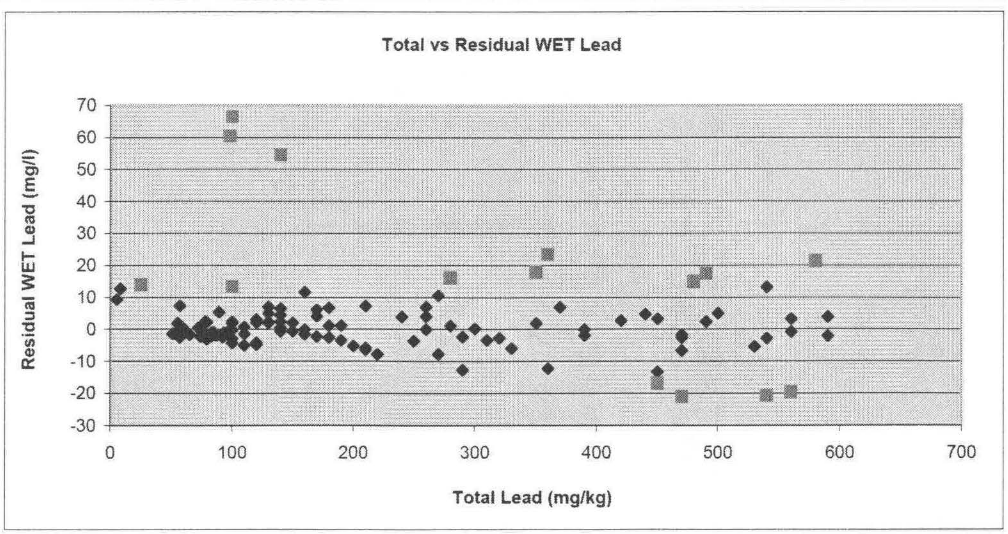
Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	Residual WET Lead (mg/l)	Squared Residual WET Lead (mg/l)
B-93 1'	1	160	7.4	0.04	0.00
B-62 0'	0	260	12	0.04	0.00
B-5 1'	1	390	18	0.07	0.00
B-127 1'	1	100	4.5	-0.10	0.01
B-87 0'	0	300	14	0.20	0.04
B-118 0'	0	98	4.3	-0.21	0.04
B-116 0'	0	75	3.1	-0.35	0.12
B-35 0'	0	99	4.1	-0.45	0.20
B-83 0'	0	72	3.8	0.49	0.24
B-69 2'	2	55	2.0	-0.53	0.28
B-47 1'	1	140	5.9	-0.54	0.29
B-28 1'	1	150	6.3	-0.60	0.36
B-68 0'	0	140	7.1	0.66	0.44
B-51 0'	0	59	3.4	0.69	0.47
B-92 0'	0	560	25	-0.75	0.57
B-29 1'	1	110	5.9	0.84	0.71
B-63 0'	0	85	3.0	-0.91	0.83
B-119 1'	1	96	3.5	-0.91	0.84
B-116 1'	1	93	3.3	-0.98	0.95
B-30 1'	1	63	1.9	-1.00	0.99
B-100 1'	1	83	2.8	-1.02	1.03
B-75 2'	2	57	1.6	-1.02	1.04
B-7 2'	2	280	14	1.12	1.26
B-66 1'	1	180	9.5	1.22	1.49
B-53 1'	1	53	1.2	-1.24	1.53
B-19 0'	0	190	10	1.26	1.59
B-92 1'	1	83	2.5	-1.32	1.73
B-17 0'	0	110	3.7	-1.36	1.85
B-10 1'	1	56	1.2	-1.38	1.89
B-53 2'	2	51	0.93	-1.42	2.00
B-74 1'	1	160	5.9	-1.46	2.12
B-108 0'	0	56	4.1	1.52	2.33
B-90 1'	1	65	1.4	-1.59	2.53
B-98 1'	1	65	1.4	-1.59	2.53
B-71 1'	1	470	20	-1.61	2.60
B-75 1'	1	87	2.1	-1.90	3.61
B-109 0'	0	350	18	1.91	3.63
B-47 0'	0	390	16	-1.93	3.74
B-22 0'	0	55	4.5	1.97	3.88
B-89 0'	0	100	6.6	2.00	4.01
B-4 0'	0	130	8.0	2.02	4.09
B-11 1'	1	120	7.6	2.08	4.33
B-86 1'	1	150	9.0	2.10	4.42
B-119 0'	0	83	1.7	-2.12	4.48
B-30 0'	0	590	25	-2.13	4.54
B-103 1'	1	79	1.5	-2.13	4.55
B-15 0'	0	170	5.6	-2.22	4.92
B-46 0'	0	79	5.9	2.27	5.14
B-25 0'	0	74	1.1	-2.30	5.30
B-41 0'	0	130	8.3	2.32	5.39
B-6 0'	0	290	11	-2.34	5.46
B-118 1'	1	100	7.0	2.40	5.77
B-4 2'	2	92	1.8	-2.43	5.91
B-88 1'	1	140	8.9	2.46	6.06
B-86 0'	0	490	25	2.47	6.09

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	Residual WET Lead (mg/l)	Squared Residual WET Lead (mg/l)
B-40 1'	1	180	5.8	-2.48	6.14
B-19 1'	1	57	0.125	-2.50	6.23
B-64 0'	0	78	6.1	2.51	6.32
B-9 1'	1	470	19	-2.61	6.83
B-137 1'	1	420	22	2.69	7.21
B-12 1'	1	320	12	-2.72	7.37
B-12 2'	2	100	1.8	-2.80	7.83
B-5 0'	0	540	22	-2.83	8.02
B-74 0'	0	120	8.5	2.98	8.89
B-125 1'	1	79	0.59	-3.04	9.26
B-17 1'	1	120	8.7	3.18	10.12
B-35 1'	1	560	29	3.25	10.55
B-57 0'	0	310	11	-3.26	10.60
B-8 1'	1	450	24	3.31	10.93
B-101 2'	2	190	5.3	-3.44	11.81
B-122 1'	1	250	7.9	-3.60	12.93
B-135 0'	0	590	31	3.87	14.97
B-98 0'	0	240	15	3.96	15.71
B-126 0'	0	260	16	4.04	16.35
B-111 1'	1	120	1.4	-4.12	16.96
B-102 0'	0	170	12	4.18	17.49
B-7 1'	1	100	0.39	-4.21	17.71
B-97 0'	0	140	11	4.56	20.81
B-129 0'	0	120	0.82	-4.70	22.07
B-67 0'	0	440	25	4.77	22.72
B-34 1'	1	110	0.125	-4.93	24.34
B-12 0'	0	500	28	5.01	25.07
B-70 0'	0	130	11	5.02	25.22
B-48 0'	0	200	4.0	-5.20	27.01
B-93 0'	0	530	19	-5.37	28.86
B-32 2'	2	89	9.5	5.41	29.24
B-77 0'	0	210	3.9	-5.76	33.14
B-72 1'	1	330	9.3	-5.88	34.52
B-135 1'	1	170	14	6.18	38.22
B-77 1'	1	210	3.4	-6.26	39.15
B-32 1'	1	140	13	6.56	43.06
B-84 0'	0	470	15	-6.61	43.74
B-132 1'	1	180	15	6.72	45.19
B-75 0'	0	370	24	6.99	48.79
B-31 1'	1	130	13	7.02	49.31
B-76 0'	0	130	13	7.02	49.31
B-58 0'	0	260	19	7.04	49.61
B-52 0'	0	210	17	7.34	53.92
B-55 1'	1	57	10	7.38	54.45
B-29 0'	0	270	4.7	-7.72	59.54
B-6 2'	2	220	2.3	-7.82	61.10
B-80 2'	2	5.2	9.6	9.36	87.63
B-121 0'	0	270	23	10.58	112.02
B-73 0'	0	160	19	11.64	135.54
B-37 1'	1	360	4.3	-12.25	150.18
B-124 1'	1	8.1	13	12.63	159.45
B-41 1'	1	290	0.70	-12.64	159.66
B-109 1'	1	540	38	13.17	173.39
B-26 0'	0	450	7.5	-13.19	174.07

Not Used

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	Residual WET Lead (mg/l)	Squared Residual WET Lead (mg/l)
B-24 1'	1	100	18	13.40	179.60
B-3 1'	1	25	15	13.85	191.83
B-91 0'	0	480	37	14.93	222.81
B-96 1'	1	280	29	16.12	259.98
B-81 0'	0	450	3.8	-16.89	285.39
B-101 1'	1	490	40	17.47	305.10
B-125 0'	0	350	34	17.91	320.59
B-8 2'	2	560	6.1	-19.65	386.20
B-123 1'	1	540	4.1	-20.73	429.83
B-52 1'	1	470	0.51	-21.10	445.35
B-113 0'	0	580	48	21.33	454.90
B-3 0'	0	360	40	23.45	549.68
B-134 0'	0	140	61	54.56	2977.01
B-105 0'	0	98	65	60.49	3659.45
B-31 0'	0	100	71	66.40	4409.15





SB-WR-X-0		NB-OCs-X-0	
Number of Valid Observations	65	Number of Valid Observations	51
Number of Distinct Observations	54	Number of Distinct Observations	44
Minimum	2.5	Minimum	2.5
Maximum	2700	Maximum	2000
Mean	460	Mean	257.3
Median	160	Median	55
SD	580	SD	405.3
Variance	336390	Variance	164237
Coefficient of Variation	1.261	Coefficient of Variation	1.575
Skewness	1.766	Skewness	2.476
Mean of log data	5.163	Mean of log data	4.457
SD of log data	1.622	SD of log data	1.551
90% Standard Bootstrap UCL	549.9	90% Standard Bootstrap UCL	329.3
95% Standard Bootstrap UCL	577	95% Standard Bootstrap UCL	349.9

SB-WR-X-1		NB-OCs-X-1	
Number of Valid Observations	65	Number of Valid Observations	51
Number of Distinct Observations	56	Number of Distinct Observations	43
Minimum	1.5	Minimum	2.5
Maximum	1300	Maximum	4100
Mean	171.9	Mean	312.7
Median	37	Median	53
SD	292	SD	671.6
Variance	85290	Variance	451048
Coefficient of Variation	1.699	Coefficient of Variation	2.147
Skewness	2.488	Skewness	4.051
Mean of log data	3.882	Mean of log data	4.05
SD of log data	1.679	SD of log data	1.962
90% Standard Bootstrap UCL	219.5	90% Standard Bootstrap UCL	431.3
95% Standard Bootstrap UCL	231.8	95% Standard Bootstrap UCL	468.1

SB-WR-X-2		NB-OCs-X-2	
Number of Valid Observations	65	Number of Valid Observations	51
Number of Distinct Observations	42	Number of Distinct Observations	39
Minimum	2.4	Minimum	2.5
Maximum	1900	Maximum	830
Mean	39.28	Mean	53.47
Median	8	Median	8.1
SD	234.6	SD	143.6
Variance	55030	Variance	20626
Coefficient of Variation	5.971	Coefficient of Variation	2.686
Skewness	8.043	Skewness	4.293
Mean of log data	2.188	Mean of log data	2.53
SD of log data	0.912	SD of log data	1.434
90% Standard Bootstrap UCL	76.28	90% Standard Bootstrap UCL	79.21
95% Standard Bootstrap UCL	86.62	95% Standard Bootstrap UCL	85.83

SB-UA-X-0		SB-UA-0	
Number of Valid Observations	60	Number of Valid Observations	9
Number of Distinct Observations	50	Number of Distinct Observations	9
Minimum	2.5	Minimum	21
Maximum	5300	Maximum	1500
Mean	559.5	Mean	300.3
Median	225	Median	83
SD	849.9	SD	483.9
Variance	722309	Variance	234125
Coefficient of Variation	1.519	Coefficient of Variation	1.611
Skewness	3.462	Skewness	2.356
Mean of log data	5.279	Mean of log data	4.766
SD of log data	1.688	SD of log data	1.4
90% Standard Bootstrap UCL	699.6	90% Standard Bootstrap UCL	496.1
95% Standard Bootstrap UCL	742.7	95% Standard Bootstrap UCL	547.6

SB-UA-X-1		SB-UA-1	
Number of Valid Observations	60	Number of Valid Observations	9
Number of Distinct Observations	52	Number of Distinct Observations	9

Minimum	1.5	Minimum	8.5
Maximum	1300	Maximum	100
Mean	203.1	Mean	46.57
Median	65	Median	36
SD	312.2	SD	39.33
Variance	97442	Variance	1547
Coefficient of Variation	1.537	Coefficient of Variation	0.845
Skewness	2.071	Skewness	0.531
Mean of log data	4.049	Mean of log data	3.427
SD of log data	1.756	SD of log data	1.031
90% Standard Bootstrap UCL	256.3	90% Standard Bootstrap UCL	62.33
95% Standard Bootstrap UCL	267	95% Standard Bootstrap UCL	66.74
SB-UA-X-2		SB-UA-2	
Number of Valid Observations	60	Number of Valid Observations	9
Number of Distinct Observations	39	Number of Distinct Observations	9
Minimum	2.4	Minimum	2.5
Maximum	1900	Maximum	14
Mean	58.8	Mean	7.633
Median	8.15	Median	6.4
SD	264.4	SD	3.338
Variance	69885	Variance	11.14
Coefficient of Variation	4.496	Coefficient of Variation	0.437
Skewness	6.338	Skewness	0.636
Mean of log data	2.372	Mean of log data	1.938
SD of log data	1.16	SD of log data	0.486
90% Standard Bootstrap UCL	101	90% Standard Bootstrap UCL	8.984
95% Standard Bootstrap UCL	114.5	95% Standard Bootstrap UCL	9.324
SB-OCs-X-0		NB-UA-0	
Number of Valid Observations	56	Number of Valid Observations	10
Number of Distinct Observations	46	Number of Distinct Observations	10
Minimum	2.5	Minimum	17
Maximum	2700	Maximum	4600
Mean	485.6	Mean	653.7
Median	190	Median	139.5
SD	593.8	SD	1413
Variance	352541	Variance	1996000
Coefficient of Variation	1.223	Coefficient of Variation	2.161
Skewness	1.726	Skewness	2.962
Mean of log data	5.226	Mean of log data	5.017
SD of log data	1.657	SD of log data	1.728
90% Standard Bootstrap UCL	585.4	90% Standard Bootstrap UCL	1202
95% Standard Bootstrap UCL	615.2	95% Standard Bootstrap UCL	1374
SB-OCs-X-1		NB-UA-1	
Number of Valid Observations	56	Number of Valid Observations	10
Number of Distinct Observations	50	Number of Distinct Observations	10
Minimum	1.5	Minimum	8
Maximum	1300	Maximum	1200
Mean	192.1	Mean	201.9
Median	39.5	Median	39.5
SD	309.9	SD	377.2
Variance	96036	Variance	142289
Coefficient of Variation	1.613	Coefficient of Variation	1.869
Skewness	2.247	Skewness	2.528
Mean of log data	3.955	Mean of log data	4.064
SD of log data	1.757	SD of log data	1.592
90% Standard Bootstrap UCL	242.1	90% Standard Bootstrap UCL	346.1
95% Standard Bootstrap UCL	258.8	95% Standard Bootstrap UCL	382.4
SB-OCs-X-2		NB-UA-2	
Number of Valid Observations	56	Number of Valid Observations	10
Number of Distinct Observations	37	Number of Distinct Observations	7
Minimum	2.4	Minimum	1
Maximum	1900	Maximum	49
Mean	44.37	Mean	10.91

Median	8
SD	252.7
Variance	63843
Coefficient of Variation	5.694
Skewness	7.466
Mean of log data	2.228
SD of log data	0.96
90% Standard Bootstrap UCL	87.3
95% Standard Bootstrap UCL	101.1

NB-WR-X-0

Number of Valid Observations	61
Number of Distinct Observations	53
Minimum	2.5
Maximum	4600
Mean	322.3
Median	74
SD	676.9
Variance	458163
Coefficient of Variation	2.1
Skewness	4.705
Mean of log data	4.549
SD of log data	1.58
90% Standard Bootstrap UCL	431.8
95% Standard Bootstrap UCL	463.9

NB-WR-X-1

Number of Valid Observations	61
Number of Distinct Observations	50
Minimum	2.5
Maximum	4100
Mean	294.6
Median	43
SD	631.6
Variance	398930
Coefficient of Variation	2.144
Skewness	4.158
Mean of log data	4.052
SD of log data	1.895
90% Standard Bootstrap UCL	394.5
95% Standard Bootstrap UCL	423.6

NB-WR-X-2

Number of Valid Observations	61
Number of Distinct Observations	44
Minimum	1
Maximum	830
Mean	46.5
Median	7.9
SD	132.2
Variance	17471
Coefficient of Variation	2.843
Skewness	4.715
Mean of log data	2.412
SD of log data	1.407
90% Standard Bootstrap UCL	68.31
95% Standard Bootstrap UCL	72.91

NB-UA-X-0

Number of Valid Observations	57
Number of Distinct Observations	50
Minimum	2.5
Maximum	5300
Mean	369
Median	85
SD	779.1

Median	6.8
SD	14.17
Variance	200.9
Coefficient of Variation	1.299
Skewness	2.556
Mean of log data	1.807
SD of log data	1.138
90% Standard Bootstrap UCL	16.18
95% Standard Bootstrap UCL	17.96

SB-WR-0

Number of Valid Observations	4
Number of Distinct Observations	4
Minimum	27
Maximum	5300
Mean	1594

SB-WR-1

Number of Valid Observations	4
Number of Distinct Observations	4
Minimum	65
Maximum	790
Mean	357

SB-WR-2

Number of Valid Observations	4
Number of Distinct Observations	4
Minimum	15
Maximum	820
Mean	260.75

NB-WR-0

Number of Valid Observations	6
Number of Distinct Observations	6
Minimum	100
Maximum	5300
Mean	1318
Median	520
SD	1987
Variance	3947097
Coefficient of Variation	1.507
Skewness	2.262
Mean of log data	6.393
SD of log data	1.353
90% Standard Bootstrap UCL	2274
95% Standard Bootstrap UCL	2547

Variance	606989
Coefficient of Variation	2.112
Skewness	4.914
Mean of log data	4.661
SD of log data	1.634
90% Standard Bootstrap UCL	502
95% Standard Bootstrap UCL	536.6

NB-UA-X-1

Number of Valid Observations	57
Number of Distinct Observations	48
Minimum	2.5
Maximum	4100
Mean	288.4
Median	56
SD	638.8
Variance	408120
Coefficient of Variation	2.215
Skewness	4.297
Mean of log data	4.055
SD of log data	1.877
90% Standard Bootstrap UCL	392.3
95% Standard Bootstrap UCL	426.8

NB-UA-X-2

Number of Valid Observations	57
Number of Distinct Observations	43
Minimum	2.5
Maximum	830
Mean	49.59
Median	8.7
SD	136.2
Variance	18562
Coefficient of Variation	2.747
Skewness	4.556
Mean of log data	2.525
SD of log data	1.385
90% Standard Bootstrap UCL	72.17
95% Standard Bootstrap UCL	78.76

SB-68-116-0

Number of Valid Observations	48
Number of Distinct Observations	42
Minimum	2.5
Maximum	5300
Mean	547.2
Median	190
SD	891.7
Variance	795178
Coefficient of Variation	1.63
Skewness	3.704
Mean of log data	5.231
SD of log data	1.69
90% Standard Bootstrap UCL	705.3
95% Standard Bootstrap UCL	753

SB-68-116-1

Number of Valid Observations	48
Number of Distinct Observations	42
Minimum	1.5
Maximum	1300
Mean	182
Median	43.5
SD	300.2
Variance	90099
Coefficient of Variation	1.649

NB-WR-1

Number of Valid Observations	6
Number of Distinct Observations	6
Minimum	15
Maximum	150
Mean	81.83
Median	86.5
SD	56.64
Variance	3209
Coefficient of Variation	0.692
Skewness	-0.0957
Mean of log data	4.094
SD of log data	0.964
90% Standard Bootstrap UCL	108.8
95% Standard Bootstrap UCL	116.3

NB-WR-2

Number of Valid Observations	6
Number of Distinct Observations	6
Minimum	2.5
Maximum	35
Mean	16.57
Median	10.8
SD	13.18
Variance	173.6
Coefficient of Variation	0.795
Skewness	0.743
Mean of log data	2.48
SD of log data	0.961
90% Standard Bootstrap UCL	22.95
95% Standard Bootstrap UCL	24.61

NB-1-48-0

Number of Valid Observations	48
Number of Distinct Observations	44
Minimum	2.5
Maximum	5300
Mean	441.9
Median	99.5
SD	1002
Variance	1003417
Coefficient of Variation	2.267
Skewness	4.101
Mean of log data	4.701
SD of log data	1.714
90% Standard Bootstrap UCL	626.8
95% Standard Bootstrap UCL	667.1

NB-1-48-1

Number of Valid Observations	48
Number of Distinct Observations	42
Minimum	2.5
Maximum	1400
Mean	197
Median	56.5
SD	330.5
Variance	109249
Coefficient of Variation	1.678

Skewness	2.293
Mean of log data	3.979
SD of log data	1.65
90% Standard Bootstrap UCL	236.3
95% Standard Bootstrap UCL	252

SB-68-116-2	
Number of Valid Observations	48
Number of Distinct Observations	39
Minimum	2.4
Maximum	1900
Mean	70.44
Median	8
SD	295
Variance	87026
Coefficient of Variation	4.188
Skewness	5.653
Mean of log data	2.381
SD of log data	1.259
90% Standard Bootstrap UCL	123.8
95% Standard Bootstrap UCL	139.1

SB-117-137-0	
Number of Valid Observations	21
Number of Distinct Observations	20
Minimum	12
Maximum	1900
Mean	476.6
Median	140
SD	615.2
Variance	378435
Coefficient of Variation	1.291
Skewness	1.476
Mean of log data	5.167
SD of log data	1.605
90% Standard Bootstrap UCL	648.1
95% Standard Bootstrap UCL	690.9

SB-117-137-1	
Number of Valid Observations	21
Number of Distinct Observations	20
Minimum	2.5
Maximum	1200
Mean	184.1
Median	79
SD	293.1
Variance	85920
Coefficient of Variation	1.592
Skewness	2.47
Mean of log data	3.943
SD of log data	1.808
90% Standard Bootstrap UCL	264.8
95% Standard Bootstrap UCL	287.7

SB-117-137-2	
Number of Valid Observations	21
Number of Distinct Observations	16
Minimum	2.5
Maximum	20
Mean	10.25
Median	8.7
SD	5.7
Variance	32.49
Coefficient of Variation	0.556
Skewness	0.652
Mean of log data	2.165
SD of log data	0.614
90% Standard Bootstrap UCL	11.8
95% Standard Bootstrap UCL	12.29

Skewness	2.417
Mean of log data	3.994
SD of log data	1.744
90% Standard Bootstrap UCL	257.1
95% Standard Bootstrap UCL	275.3

NB-1-48-2	
Number of Valid Observations	48
Number of Distinct Observations	35
Minimum	2.5
Maximum	560
Mean	39.88
Median	8.4
SD	93.76
Variance	8791
Coefficient of Variation	2.351
Skewness	4.307
Mean of log data	2.493
SD of log data	1.359
90% Standard Bootstrap UCL	57.45
95% Standard Bootstrap UCL	61.99

NB-49-67-0	
Number of Valid Observations	19
Number of Distinct Observations	18
Minimum	19
Maximum	2000
Mean	334.6
Median	78
SD	544
Variance	295990
Coefficient of Variation	1.626
Skewness	2.254
Mean of log data	4.747
SD of log data	1.479
90% Standard Bootstrap UCL	492.6
95% Standard Bootstrap UCL	538

NB-49-67-1	
Number of Valid Observations	19
Number of Distinct Observations	19
Minimum	5.3
Maximum	4100
Mean	473.8
Median	42
SD	1001
Variance	1001179
Coefficient of Variation	2.112
Skewness	3.009
Mean of log data	4.212
SD of log data	2.061
90% Standard Bootstrap UCL	760.3
95% Standard Bootstrap UCL	839.5

NB-49-67-2	
Number of Valid Observations	19
Number of Distinct Observations	15
Minimum	1
Maximum	830
Mean	53.76
Median	9.7
SD	188.3
Variance	35456
Coefficient of Variation	3.502
Skewness	4.334
Mean of log data	2.227
SD of log data	1.408
90% Standard Bootstrap UCL	106
95% Standard Bootstrap UCL	122.7

SB-0	
Number of Valid Observations	69
Number of Distinct Observations	58
Minimum	2.5
Maximum	5300
Mean	525.7
Median	170
SD	813.6
Variance	661985
Coefficient of Variation	1.548
Skewness	3.538
Mean of log data	5.212
SD of log data	1.653
90% Standard Bootstrap UCL	649.7
95% Standard Bootstrap UCL	683.5

SB-1	
Number of Valid Observations	69
Number of Distinct Observations	58
Minimum	1.5
Maximum	1300
Mean	182.7
Median	45
SD	295.9
Variance	87546
Coefficient of Variation	1.62
Skewness	2.291
Mean of log data	3.968
SD of log data	1.687
90% Standard Bootstrap UCL	227.1
95% Standard Bootstrap UCL	240.9

SB-2	
Number of Valid Observations	89
Number of Distinct Observations	59
Minimum	2.4
Maximum	1900
Mean	41.53
Median	7.2
SD	217.9
Variance	47481
Coefficient of Variation	5.247
Skewness	7.742
Mean of log data	2.146
SD of log data	1.029
90% Standard Bootstrap UCL	70.8
95% Standard Bootstrap UCL	78.2

NB-0	
Number of Valid Observations	67
Number of Distinct Observations	59
Minimum	2.5
Maximum	5300
Mean	411.5
Median	85
SD	893.1
Variance	797654
Coefficient of Variation	2.171
Skewness	4.265
Mean of log data	4.714
SD of log data	1.64
90% Standard Bootstrap UCL	551.7
95% Standard Bootstrap UCL	588.5

NB-1	
Number of Valid Observations	67
Number of Distinct Observations	55
Minimum	2.5
Maximum	4100
Mean	275.5
Median	46
SD	605.5
Variance	366652
Coefficient of Variation	2.198
Skewness	4.37
Mean of log data	4.056
SD of log data	1.826
90% Standard Bootstrap UCL	372.3
95% Standard Bootstrap UCL	398.2

NB-2	
Number of Valid Observations	67
Number of Distinct Observations	48
Minimum	1
Maximum	830
Mean	43.82
Median	8.7
SD	126.4
Variance	15970
Coefficient of Variation	2.884
Skewness	4.954
Mean of log data	2.418
SD of log data	1.368
90% Standard Bootstrap UCL	62.89
95% Standard Bootstrap UCL	69.65

TCLP Pb	
Number of Valid Observations	44
Number of Distinct Observations	36
Minimum	0.125
Maximum	51
Mean	2.624
Median	0.76
SD	7.647
Variance	58.48
Coefficient of Variation	2.915
Skewness	6.159
Mean of log data	-0.0966
SD of log data	1.29
95% Standard Bootstrap UCL	4.512

Sb	
Number of Valid Observations	226
Number of Distinct Observations	31
Minimum	1
Maximum	12
Mean	1.669
Median	1
SD	1.796
Variance	3.227
Coefficient of Variation	1.076
Skewness	3.059
Mean of log data	0.25
SD of log data	0.593
95% Standard Bootstrap UCL	1.865

As	
Number of Valid Observations	225
Number of Distinct Observations	37
Minimum	0.5
Maximum	10
Mean	1.243
Median	0.5
SD	1.426
Variance	2.034
Coefficient of Variation	1.148
Skewness	2.583
Mean of log data	-0.185
SD of log data	0.801
95% Standard Bootstrap UCL	1.398

Cd	
Number of Valid Observations	226
Number of Distinct Observations	21
Minimum	0.5
Maximum	3.5
Mean	1.14
Median	1.2
SD	0.57
Variance	0.325
Coefficient of Variation	0.5
Skewness	0.71
Mean of log data	-0.00232
SD of log data	0.534
95% Standard Bootstrap UCL	1.204

Cr	
Number of Valid Observations	226
Number of Distinct Observations	63
Minimum	4.1
Maximum	200
Mean	43.99
Median	41
SD	21.04
Variance	442.9
Coefficient of Variation	0.478
Skewness	3.672
Mean of log data	3.699
SD of log data	0.423
95% Standard Bootstrap UCL	46.33

V	
Number of Valid Observations	226
Number of Distinct Observations	70
Minimum	22
Maximum	140
Mean	51.35
Median	45
SD	22.88
Variance	523.3
Coefficient of Variation	0.446
Skewness	1.477
Mean of log data	3.856
SD of log data	0.394
95% Standard Bootstrap UCL	53.82

Zn	
Number of Valid Observations	226
Number of Distinct Observations	83
Minimum	24
Maximum	2300
Mean	126.5
Median	64
SD	227.8
Variance	51900
Coefficient of Variation	1.801
Skewness	6.366
Mean of log data	4.419
SD of log data	0.725
95% Standard Bootstrap UCL	151.8

Hg	
Number of Valid Observations	226
Number of Distinct Observations	23
Minimum	0.05
Maximum	1.6
Mean	0.0877
Median	0.05
SD	0.132
Variance	0.0175
Coefficient of Variation	1.508
Skewness	7.966
Mean of log data	-2.718
SD of log data	0.585
95% Standard Bootstrap UCL	0.102

Attachment F

Information on Disposing Groundwater to City of Palo Alto Sanitary Sewer System During the time of implementing CSWPPP

Dewatering and Non-Storm Water Discharge Control during the time of CSWPPP before "Dewatering Discharge Plan" is approved

During the time of implementing CSWPPP, groundwater may be generated from the following work activities:

Perform roadway excavation for the new abutment and pier walls (see Structure Plans sheet 2) at the two locations as shown on Water Pollution Control Drawing sheet 4 of this Conceptual SWPPP. Perform pile driving and some portions of the abutment and pier wall construction which can be accomplished from outside creek. Remove and abandon the 96" culvert (see Drainage Details sheet DD-2). All these activities will be performed from outside creek.

At this time, Contractor is still in the process of preparing and obtaining approval for the Dewatering Discharge Plan (DDP) according to the Caltrans standard specification section 13-8 "Temporary Active Treatment System". Prior to approval of DDP, you may dispose the groundwater to the City of Palo Alto sanitary sewer system. Please contact City of Palo Alto Water Pollution Control Plant for disposing the groundwater to sanitary sewer system.

Contact Name: Kirsten Struve

Contact Number: 650-329-2421

An Exceptional Waste Discharge Permit will be required for disposing groundwater to city sanitary sewer system with an application fee of $750. The quantity rate is $5.65 per 100 cubic feet of discharge per city utility fee schedule.

Attached please find the application form for the Exceptional Waste Discharge Permit and a sewer map in the project area for your reference.

Chen, Jiangfan@DOT

From:	Struve, Kirsten [Kirsten.Struve@CityofPaloAlto.org]
Sent:	Thursday, December 11, 2014 10:53 AM
To:	Chen, Jiangfan@DOT
Subject:	RE: Sewer Discharge Permit

Discharge of clean groundwater can go to the storm drain system (please contact Mike Nafziger):
The street work permit as well as street work permit information can be found by following the link below:

http://www.cityofpaloalto.org/gov/depts/pwd/forms_and_permits.asp

Under the bold text 'Forms and Permits', you'll see 'Permit Applications and Information' and the first permit listed is the Street Work Permit.

Discharge of contaminated water to the sanitary sewer system:
http://www.cityofpaloalto.org/gov/depts/pwd/pollution/forms.asp

Scroll down to exceptional waste discharge permit. You do not need to do additional sampling, just submit what you have done already. The most important elements are: dates of discharge, estimated volume, treatment system (baker tanks), and preferred manhole that is close to your site (you can submit a google earth image or if you need to, I can send you a sewer map of the area as well). The permit fee is $750. You can submit a check with your application. If you need to pay by credit card (which you would do at the counter at City Hall), please contact us for instructions. The quantity rate is $5.65 per 100 cubic feet of discharge per our utility fee schedule.

Hope this helps, Kirsten

Thanks, Kirsten

Kirsten Struve
Manager, Environmental Control Program
650-329-2421

REGIONAL WATER QUALITY CONTROL PLANT
2501 Embarcadero Way
Palo Alto, CA 94303

TELEPHONE: 650/329-2598

OPERATED BY THE CITY OF PALO ALTO FOR THE
EAST PALO ALTO SANITARY DISTRICT-LOS ALTOS-LOS ALTOS HILLS-MOUNTAIN VIEW-PALO ALTO-STANFORD

DISCHARGE APPLICATION FOR EXCEPTIONAL WASTEWATER

One-Time Batch Discharge____ Series of Batches___

A. PROJECT IDENTIFICATION

Business Name:____

Address at Point of Discharge:____

____

Contact Person:____

Mailing Address:____

Telephone:___________________________ Emergency Telephone:_______________________

B. PERMITTEE'S CONSULTANT

Name:____

Address:____

Contact Person:____

Telephone:___________________________________ Fax:_______________________________

C. PROJECT DESCRIPTION

☐ Decontamination
☐ Excavation Dewatering
☐ Vault Dewatering
☐ Line Flushing
☐ Site Clean-up
☐ Tank Removal
☐ Elevator Shaft Dewatering
☐ Other:_____________________________

D. TYPE OF CONTAMINANTS

☐ Fuel ☐ Solvents ☐ Heavy Metals ☐ Cyanide ☐ Others________________

E. DISCHARGE QUALITY

1. Please indicate the proposed quantity of wastewater and the desired dates of discharge:

   Quantity Discharged:________________________(gallons)

   Flow Rate:___________________________(gallons per minute)

   Anticipated date of discharge:___________________________________

2. Provide a map identifying the exact discharge location(s) (clean out, manhole, etc.).

3. Describe treatment systems, if any, to be used to treat contaminated water. List the parameters to be treated:

   ____

   ____

   ____

F. CERTIFICATION SIGNATURE

I certify, under penalty of law, that the information contained in this report is true and correct to the best of my knowledge. I am personally qualified to make this certification or I have consulted with a professional who is qualified to make this certification.

Please check one of the following:

☐ a. I am a principal of at least the level of vice president (if the permittee is a corporation).

☐ b. I am a general partner or proprietor (if the permittee is a partnership or sole proprietorship respectively).

☐ c. I am a duly authorized representative of the individual designated in A or B above (if such representative is responsible for the overall operation of the facility from which the discharge originates.) I further certify that a DESIGNATION OF AUTHORIZED REPRESENTATIVE (DOAR) form has been sent to the Control Authority.

____________________________________ PRINT NAME OF OFFICIAL	____________________________________ DATE
____________________________________ SIGNATURE OF OFFICIAL	____________________________________ TITLE OF SIGNING OFFICIAL
____________________________________ PHONE OF SIGNING OFFICIAL	____________________________________ ADDRESS IF DIFFERENT THAN "A" ABOVE

Attachments:
1) Table 1 Metals Required
2) Table 2 List of Organics
3) Sampling Instructions
4) Hazardous Waste Certification
5) DOAR Statement

ATTACHMENT 1

TABLE 1 INORGANICS REQUIRED for ANALYSIS	
TOXICANT	**MAXIMUM**
Arsenic	0.1 mg/liter
Cadmium	0.1 mg/liter
Chromium Total	2.0 mg/liter
Copper**	2.0 mg/liter
Lead	0.5 mg/liter
Mercury	0.05 mg/liter
Nickel*	0.5 mg/liter
Selenium	1.0 mg/liter
Silver*	0.25 mg/liter
Zinc	2.0 mg/liter
Suspended Solids*	3000 mg/liter
Total Dissolved Solids*	5000 mg/liter
pH	5.5 - 11.0

For discharges <50K gallons per day the maximum concentration will be 2 the values listed in the table with the exception of A*≅.

**Copper Limit:

0.25 mg/liter effective July 1, 1998 for all non-process discharge points.

0.25 mg/liter effective July 1, 1997 for cooling system discharges exceeding 2,000 gallons per day.

0.4 mg/liter annual average effective July 1, 1996 for metal finishing process discharges plus reasonable control measures or mass limit specific to an individual industry.

For vehicle service, photoprocessing and metal fabrication, the limit will remain at 2.0 mg/liter.

ATTACHMENT 2

TABLE 2

TOTAL TOXIC ORGANICS

(40 CFR, Section 413.02(I))

Acenaphthene
Acrolein
Acrylonitrile
Benzene
Benzidine
Carbon tetrachloride (tetrachloromethane)
Chlorobenzene
1,2,4-trichlorobenzene
Hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
Hexachloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Bis (2-chloroethyl) ether
2-chloroethyl vinyl ether (mixed)
2-chloronaphthalene
2,4,6-trichlorophenol
Parachlorometa cresol
Chloroform (trichloromethane)
2-chlorophenol
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3-dichlorobenzidine
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane
1,3-dichloropropylene (1,3-dichloropropene)
2,4-dimethylphenol
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Ethylbenzene
Fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis (2-chloroisopropyl) ether
Bis (2-chloroethoxy) methane
Methylene chloride (dichloromethane)
Methyl chloride (chloromethane)
Methyl bromide (bromomethane)
Bromoform (tribromomethane)
Dichlorobromomethane
Chlorodibromomethane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dinitro-o-cresol
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
Pentachlorophenol
Phenol
Bis (2-ethylhexyl) phthalate
Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
1,2-benzanthracene (benzo(a)anthracene)
Benzo(a)pyrene (3,4-benzopyrene)
3,4-Benzofluoranthene (benzo(b)fluoranthene)
11,12-benzofluoranthene (benzo(k)fluoranthene)
Chrysene
Acenaphthylene
Anthracene
1,12-benzoperylene (benzo(ghi)perylene)
Fluorene
Phenanthrene
1,2,5,6-dibenzanthracene (dibenzo(a,h)anthracene)
Indeno (1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
Pyrene
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl chloride (chloroethylene)
Aldrin
Dieldrin
Chlordane (technical mixture and metabolites)
4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)
Alpha-endosulfan
Beta-endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
(BHC-hexachlorocyclohexane)
  Alpha-BHC
  Beta-BHC
  Gamma-BHC
  Delta-BHC
(PCB-polychlorinated biphenyls)
  PCB-1242 (Arochlor 1242)
  PCB-1254 (Arochlor 1254)
  PCB-1221 (Arochlor 1221)
  PCB-1232 (Arochlor 1232)
  PCB-1248 (Arochlor 1248)
  PCB-1260 (Arochlor 1260)
  PCB-1016 (Arochlor 1016)
Toxaphene
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

ATTACHMENT 3

SAMPLING INSTRUCTIONS

[PLEASE REFER TO THE APPROPRIATE REQUIRED ANALYSIS]

I. Definitions

1. Sample: A sample is a known volume of wastewater representing the true characteristics of the effluent which is discharged from industrial wastewater processes and collected for a specific duration of time.

2. Types of Samples: The two most common types of samples are grab samples and 24 hour composite samples and may be obtained either manually or automatically.

   a. A grab sample is a given volume of discharge which is collected at a single point in time.

   b. A 24 hour composite sample is a mixture of individual grab samples which are collected at regular intervals. Equal volumes of the individual samples shall be used unless flow monitoring allows for flow proportioning of the composite sample. Unless flow proportioning is being conducted, each grab sample shall be at least 50 ml.

3. Manual Sampling: Manual sampling is the manual collection of a sample using an appropriate container (see attachment, table 1).

4. Automatic Sampling: Automatic sampling is the collection of grab samples at regular intervals using a mechanical device.

II. Sample Collection and Sample Preservation

1. Metals

   Collect self-monitoring samples for metals analysis at the point of discharge of the contaminated groundwater downstream of any pretreatment system but prior to any dilution streams. A grab sample for metals analysis may be taken.

   Immediately after collection, samples must be measured for pH and preserved by adding nitric acid until a pH <2 is attained. Please record the time and date of sample collection, pH, and the name of the person(s) collecting/preserving the samples. Submit the composite sample as soon as collected to a laboratory approved by the California Department of Health Services for such analysis.

2. Cyanide

   Collect self-monitoring samples for cyanide analysis at the point of discharge of the cyanide bearing wastestream downstream of any pretreatment system but prior to any dilution streams.

Each cyanide sample shall be collected as a grab sample and immediately preserved by adding sodium hydroxide until a pH >12 is attained. If chlorine destruction of cyanide has been used, check the sample for chlorine residual and dechlorinate the sample with 0.6 g. ascorbic acid per liter of sample before adjusting pH with sodium hydroxide. Cyanide samples shall be kept in the dark and refrigerated at 4 degrees centigrade. Please record the time and date of sample collection, pH, and the name of the person(s) collecting/preserving the samples. Submit composite samples to a laboratory approved by the California Department of Health Services for such analysis.

3. Fluoride

Collect self-monitoring samples for fluoride analysis at the point of discharge of the fluoride bearing wastestream downstream of any pretreatment system but prior to any dilution stream.

A 24-hour composite sample shall be taken consisting of individual representative samples collected every 15 minutes. It is recommended that an automatic sampler be used, but if an automatic sampler is not available, manual grab samples may be taken every 15 minutes. A composite sample may then be prepared from the set of preserved grab samples. Equal volumes of the individual samples shall be used unless flow monitoring allows for flow proportioning of the composite sample.

Both grab and composite sample containers should be supplied to you by your analytical laboratory. Plastic containers, not glass, are appropriate for fluoride samples.

Immediately after collection, samples must be measured for pH. Please record the time and date of sample collection, pH, and the name of the person(s) collecting the samples. Submit the composite sample within one week of collection to a laboratory approved by the California Department of Health Services for such analysis.

All records must be retained and made available to City personnel upon demand. Results shall be transcribed onto self-monitoring logs and submitted along with the original laboratory reports.

4. TTO

Collect self-monitoring samples for TTO analysis at the point of discharge from the process streams downstream of any pretreatment system but prior to any dilution streams.

A 6-hour composite sample is required, but neither automatic nor field compositing of the individual grab samples is permitted due to the volatility of the compounds. Individual grab samples must be taken manually at least once every two hours.

For maximum reliability, it is suggested that at least three duplicates of each grab sample be taken. Only glass containers are appropriate for TTO samples and should be supplied to you by your analytical laboratory. Due to their volatile nature, a special sampling technique shall be used to collect samples for TTO analysis. A 40-ml glass sample bottle (or vial) should be filled in such a manner that no air bubbles pass through the sample as the bottle is being filled. The bottle or vial shall then be carefully sealed so that no air bubbles are entrapped in it. This hermetic seal must be maintained until the sample is analyzed. The analytical laboratory performing the analysis will then composite the individual grab samples for a single analysis for each analytical method.

The laboratory shall use the following procedure for compositing grab samples:

Composite only grab samples of equal volume. Carefully pour the contents of all individual grab samples collected from a given source during the specified time period into a 1,000 ml round bottom flask which is chilled in a wet ice bath. Stir the mixture gently with a glass rod for approximately one minute while in the ice bath. Carefully fill four to six clean 40 ml vials with composited sample, following same protocol for ensuring that no trapped air is in the container, and seal hermetically. Hold composited samples at 4 deg C, hermetically sealed, and analyze within acceptable holding time for the analysis. Preserve the replicate samples for verification analysis if needed. A similar protocol may be followed for other types of volatile organics samples using other container types and sizes.

The method of analysis shall be capable of detecting at least 0.005 mg/l of each of the organic constituents in the discharge.

5. COD, NH_3 and SS

The COD, NH_3 and SS samples shall be 24-hour composite samples collected every 15 minutes from the designated sampling point. If an automatic sampler is used, the sampler must be equipped with ice to prevent the biological degradation of the sample during the sample collection period. Immediately after collection, the COD and NH_3 samples must be measured for pH and preserved by adding sulfuric acid until a pH<2 is attained. The suspected solids sample must be kept refrigerated until delivery to the laboratory and does not need chemical preservation.

III. Sample Chain of Custody and Analysis

The time and date of sample collection, pH (if applicable), and the name of the person(s) collecting, preserving and delivering the sample to the laboratory must be recorded on the sample chain of custody form. The chain of custody form must be retained for a minimum of three years and made available to the City personnel upon demand. Samples shall be analyzed at the discharger’s expense by a laboratory accredited by the California Department of Health Services for such analysis unless otherwise specified in the Industrial Waste Permit.

Table 1
SUMMARY OF SAMPLE HANDLING REQUIREMENTS

DETERMINATIONS	CONTAINER	PRESERVATION	MAXIMUM STORAGE RECOMMENDED/REGULATORY *
Ammonia	P, G	Analyze as soon as possible or add H_2SO_4 to pH<2	7 days/28 days
COD	P, G	Analyze immediately or add H_2SO_4 to pH<2	7 days/28 days
Cyanide (total)	P, G	Add NaOH to pH>12 Refrigerate in dark	24 hours/14 days (24 hours if sulfide present)
Fluoride	P	None required	28 days/28 days
Metals	P, G	Add HNO_3 to pH<2	180 days/180 days
Suspended Solids	P, G	Refrigerate	2 days/7 days
TTO	G, TFE-lined cap	Refrigerate	7 days/7 days until extraction
Phenols	G	Add H_2So_4 to pH<2, then refrigerate	28 days

G: glass
P: plastic
HNO_3: nitric acid
NaOH: sodium hydroxide
H_2SO_4: sulfuric acid
TFE: teflon

* Environmental Protection Agency, Rules and Regulations, Federal Register 49: No. 209, October 26, 1984. See this citation for possible differences regarding container and preservation requirements.

ATTACHMENT 4

HAZARDOUS WASTE

Certification Addendum

An application for discharge to the Palo Alto Regional Water Quality Control Plant has been prepared and is dated ________________________________.

> *I certify that the wastes for which the discharge application is being filed does not and will not constitute "hazardous waste" under Chapter 6.5 of the Health and Safety Code (Sections 25115 and 25117) and Title 22 of the California Administrative Code (Sections 66680 to, and including, 66746) at the point of discharge into the City sanitary sewer system. I am personally qualified to make this certification or I have consulted with a qualified professional who is qualified to make this certification.*

[ ] 1. I am a principal executive officer of at least the level of vice president (if the permittee is a corporation).

[ ] 2. I am a general partner or proprietor (if the permittee is a partnership or sole proprietorship respectively).

[ ] 3. I am a duly authorized representative of the individual designated in 1 or 2 above (if such representative is responsible for the overall operation of the facility from which the discharge originates).

____
PRINT NAME OF OFFICIAL

____
SIGNATURE OF OFFICIAL

____
TITLE OF OFFICIAL

____
DATE

REGIONAL WATER QUALITY CONTROL PLANT
2501 Embarcadero Way
Palo Alto, CA 94303
Telephone: 650/329-2598

Serving the Communities of
East Palo Alto Sanitary District, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford

DESIGNATION OF AUTHORIZED REPRESENTATIVE

An Industrial Waste Discharge Permit has been issued to this facility in accordance with the City of Palo Alto Sewer Use Ordinance No. 3889, Section 16.09.020. As stated in this permit, various reports are periodically due as required by Federal and State regulations. These reports require the signature of a principal executive officer of at least the level of vice-president if the permittee is a corporation OR a general partner or proprietor if the permittee is a partnership or sole proprietorship. A duly authorized representative may be designated to sign if such representative is responsible for the overall environmental compliance of the facility from which the industrial waste discharge originates. If a representative is designated to sign, then the permittee must submit to the Control Authority (jointly owned Palo Alto-Mountain View-Los Altos Public Operated Treatment Plant) a DESIGNATION OF AUTHORIZED REPRESENTATIVE (DOAR) statement.

1.

____
Print name of Designated Representative

____
Signature of Designated Representative

____
Title of Designated Representative

____
Name of Company

____
Street Address with Suite Number

____
City, State, ZIP Code

Telephone Number of Designated Representative: ______________________

2. FACILITY NAME: ____

Mailing Address: ____

Facility Address: ____

3. SIGNATURE: The above person is authorized as my representative to sign reports and certification statements submitted to the Control Authority as required by the Industrial Waste Discharge Permit. This authority shall remain in effect until the Control Authority is notified in writing of any changes.

4. Please check one of the following boxes before signing:

☐ A. I am a principal executive officer of at least the level of vice president (if the permittee is a corporation).

☐ B. I am a general partner or proprietor (if the permittee is a partnership or sole proprietorship respectively).

____
PRINT NAME OF OFFICIAL

____
SIGNATURE OF OFFICIAL

____
TITLE OF SIGNING OFFICIAL

____
DATE

MAILING ADDRESS OF SIGNING OFFICIAL:

____

____

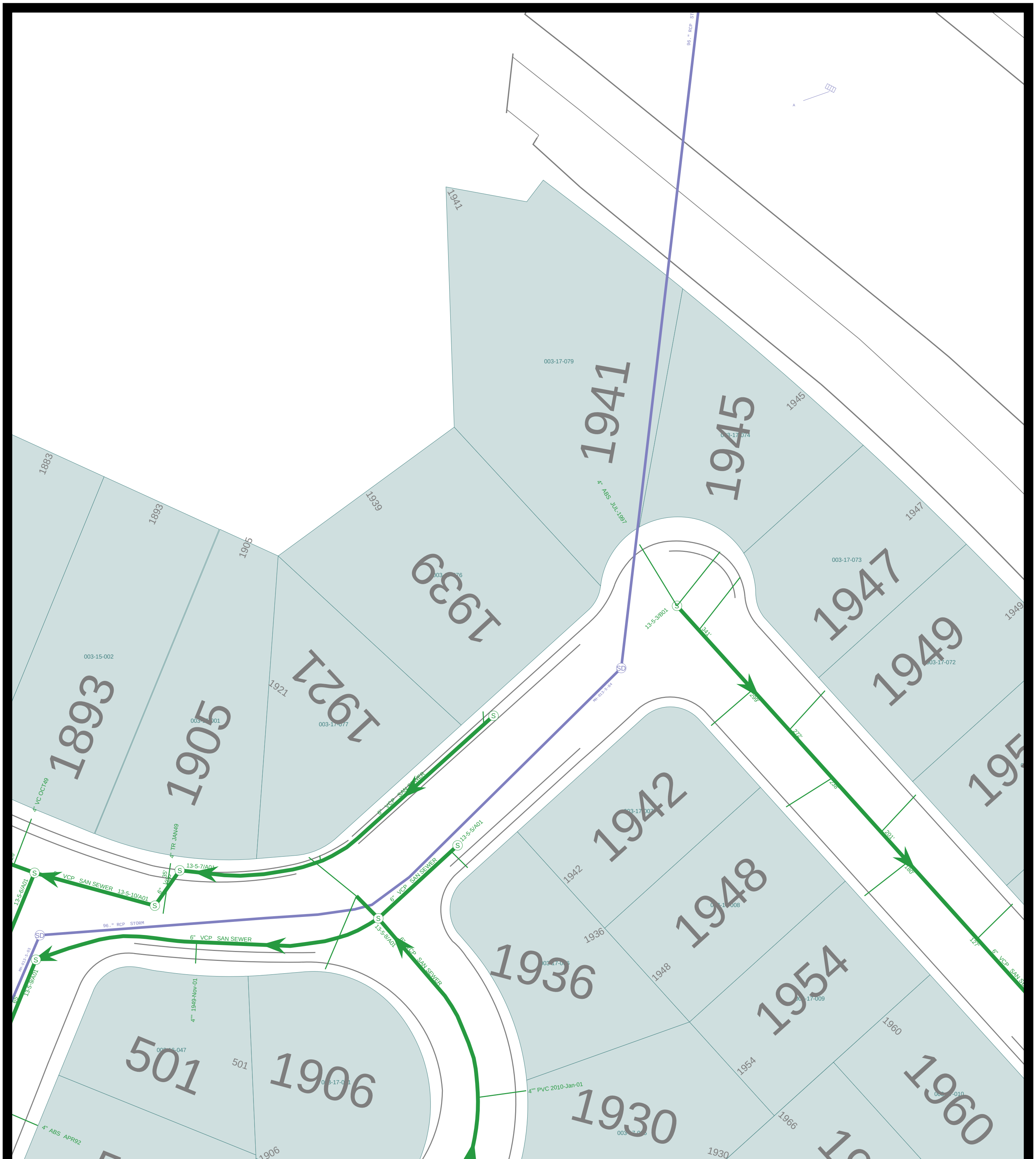
____

TELEPHONE NUMBER OF SIGNING OFFICIAL: _________________________

5. MAILING: Please return the completed DOAR to:

ENVIRONMENTAL COMPLIANCE DIVISION
REGIONAL WATER QUALITY CONTROL PLANT
2501 Embarcadero Way
Palo Alto, CA 94303

West Bayshore Sanitary and Storm Sewer



CITY OF PALO ALTO CALIFORNIA

The City of Palo Alto

ayshore Sanitary and Storm

This map is a product of the City of Palo Alto GIS

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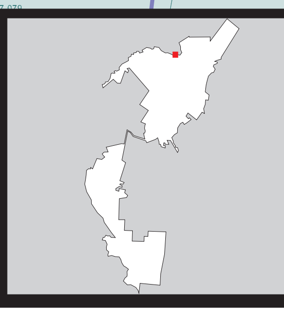
Wastewater & storm drain system w/flow direction (\\cc-maps\gis$\gis\admin\meta\view.mdb)

East Bayshore Sanitary and Storm Sewer

CITY OF PALO ALTO
INCORPORATED
APRIL 16 1894
CALIFORNIA

The City of
Palo Alto



ayshore Sanitary and Storm

This map is a product of the
City of Palo Alto GIS

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Wastewater & storm drain system w/flow direction (\\cc-maps\gis$\gis\admin\meta\view.mdb)

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. MUTHANNA OMRAN
Senior Bridge Engineer
Division of Engineering Services
Office of Bridge Design-West
Bridge Design Branch 16

Date: April 02, 2013

Attention: John E. Peterson

File: 04-SCL/SM-101-PM 0.01
04-235621
San Francisquito Cr. Bridge
Replacement
Bridge No. 35-0348

From: TUNG NGUYEN
Transportation Engineer
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

MAHMOOD MOMENZADEH
Chief, Branch C
Office of Geotechnical Design-West
Geotechnical Services
Division of Engineering Services

Subject: Final Foundation Report (FR) for San Francisquito Creek Bridge Replacement Project

INTRODUCTION

This report provides our foundation recommendations for the San Francisquito Creek Bridge replacement project. The project site is located between the cities of Palo Alto and East Palo Alto, on the border of Santa Clara and San Mateo Counties (see Location Map of Appendix A).

This Foundation Report documents site geology and subsurface conditions, provides analyses of site conditions as they pertain to the project and recommends geotechnical input for the foundation design of San Francisquito Creek Bridge (Bridge No. 35-0348), retaining walls, soundwalls, and an overhead sign.

To accomplish the above stated purpose, the following works were conducted:

- Field reconnaissance to observe and document site conditions
- Review as-built foundation data, existing reports of geotechnical investigation for San Francisquito Creek Flood Protection Project
- Site subsurface investigation
- Engineering analyses and geotechnical recommendations for the foundation design

PROJECT DESCRIPTION

The existing 3-span, about 83-foot-long, 232-foot-wide bridge was built in 1931 and widened in 1957 on State Route 101 is to be replaced with a new reinforced concrete slab bridge for public safety enhancement. The new bridge will be a 4-span bridge, 14 ft wider, and 44 ft longer than the existing bridge. Furthermore, three retaining walls, two soundwalls on the top of barrier, and an overhead sign are proposed for the project. Retaining walls with maximum height of 15 ft are: RW A located on the southeast corner, RW B located on the east side, and RW C located on the west side of the bridge. Along the West Bayshore Road, soundwall SW1 is 14 ft high located to the north and SW2 is 16 ft high located to the south of the bridge as shown in the project plans provided by District 4 Design West Peninsula. The Overhead Sign (Truss, Butterfly) Type V is proposed on median at Station 308+40.

SITE GEOLOGY AND SEISMICITY

The site geology and seismicity described herein are based on memos provided by Our Office Branch B dated October 18, 2010 and August 31, 2012 and included in the Appendix A.

Site Geology

The project site is located at the southeastern margin of the San Francisco Peninsula, which is a part of northwest-trending California Coast Ranges. The eastern margin of the peninsula is influenced by the tidal action of San Francisco Bay, and underlain predominantly by Holocene and Pleistocene deposits of unconsolidated basin and alluvial deposits, and Bay Mud overlay older rocks the lower Cretaceous/ Jurassic Franciscan complex

The project area is entirely covered by Holocene floodplain deposits (See the attached Geology map shown in Appendix A). The floodplain deposits contains very medium to dark-grey, dense, sandy to silty clay. Lenses of coarser material (silt, sand, and pebbles) may be locally present (USGS, OFR 98-231). Natural Levee deposits to the west and Flood basin deposits to the east surround the project site. The Natural Levee deposits contain loose, moderate-to well-sorted sandy or clayey silt grading to sandy or silty clay. The Flood basin deposits contain organic-rich clay to very fine silty-clay deposits occupying the lowest topographic positions between Holocene Levee deposits or Holocene flood plain deposits.

The Franciscan complex forms the basement rock underlies the entire area east of the Pilarcitos Fault. The Franciscan complex is composed of weakly to strongly metamorphosed greywacke, argillite, limestone, basalt, serpentinite, chert, and other rocks. The Franciscan rocks in this area overlain by Upper Jurassic to Upper Cretaceous turbidites (USGS, OFR 98-348).

Seismicity

The project site is located 3.9 miles (6.3 km) north of the Cascade Fault, 6.4 miles (10.34 km) west of the Silver Creek Fault, and 7.4 miles (11.87 km) east of the San Andrea Fault (Peninsula section). San Andrea Fault, Silver Creek Fault, and Cascade Fault are active faults and capable of producing Maximum Moment Magnitude (MMax) of 7.9, 7.1, and 6.9 respectively.

SUBSURFACE CONDITIONS

Field Investigation

The Office of Geotechnical Design-West conducted a subsurface investigation in August 2010. The following table lists cone penetration tests (CPT) and borings, their approximate locations, existing ground elevations, and depths:

Boring	Station	Offset, ft	Direction	Elevation, ft	Depth, ft
CPT-10-001	321+19.5	68.9	SB	+15.0	101.0
CPT-10-002	10+97.2	67.9	SB	+15.0	101.0
R-10-001	321+91.8	65.1	NB	+14.5	106.5
R-10-002	10+64.3	66.6	NB	+15.1	101.5
R-10-003	10+97.2	67.3	SB	+15.0	101.5

The subsurface investigation consisted of two CPT and three borings. The CPT probe included 1.4-inch conical tip that was hydraulically pushed to depth to measure and record tip resistance and sleeve friction, which are shown in the Log of Test Borings (LOTB) of Appendix B. The borings were drilled by rotary method with slurry to depths shown on the above table. These borings were drilled with Mobile B47 drilled trucks with safety hammers to perform in-situ Standard Penetration Tests (SPT) at 5 ft intervals. The SPT involves driving of a hollow thick-walled tube into the ground by a 140 lbs safety hammer with a 30-inch drop, measuring number of blows "N" to achieve three successive increments 6 inch each. The N of the last two increments is counted as blow count per foot. Boring logs with N values are presented in the LOTB. Sampling was achieved by using a split spoon sampler as well as California sampler and continuous coring in all borings. Selected samples were collected and submitted for laboratory tests such as water content, Atterberg Limits, grain size analysis, corrosion analysis, consolidation and shear strength. The results of laboratory tests are presented in Appendix C.

Subsurface Conditions

The subsurface conditions described herein are based on the information from subsurface investigation of the site. From the original ground elevation to depths of 25 ft and 35 ft± is very loose to medium dense sand with silt and silty sand, soft to stiff silt with gravel and sand, sandy silt, lean clay with sand, lean clay, and fat clay. These soil materials have N value ranging from 1 to 17. Below these deposits to a depth of 45 ft±, loose to medium dense silt with sand, silty sand, silty sand with gravel, sand with silt and gravel, and gravel with N ranging from 9 to 43 were encountered in the exploration borings. From the depth of 45 ft to a depth of 90 ft± is soft to very stiff fat clay, lean clay, silt and interbedded with very loose to medium dense sand/silty sand with gravel and silty sand of N value ranging from 0 to 21. These deposits are underlain by 5 to 10 ft medium dense sand with silt, silt with sand, stiff sandy silty clay, sandy silt, and silt with N value ranging from 11 to 28. Below these deposits to the maximum exploration is stiff to very stiff lean clay with the N of 16 to 20. Clayey soils encountered have a various range of plasticity from non-plastic to high.

Groundwater Conditions

Groundwater was measured after the 1st day of drilling and it was recorded at a depth varying from 13.0 to 14.0 ft below the existing road surface. Groundwater level is expected to fluctuate and could be higher depending on the season and amount of rainfall.

SCOUR EVALUATION

Scour is not an issue for the bridge pile foundation since the bottom of bridge footing is proposed below the scour depth. The anticipated short term local scour depth is 6.3 ft, reaching an elevation of -3.3 ft (See Appendix A).

CORROSION EVALUATION

Soil samples were collected from this site during the geotechnical investigation and tested for corrosion potential in conformance with the Corrosion Guidelines for Foundation Investigations (Caltrans, 2003). Table 1 presents the results of corrosion tests. According to the corrosion lab data, the site is corrosive.

Table 1. Corrosion Test Data

Sample Location	SIC Number (TL-0101)	Resistivity, om-cm	pH	Chloride, ppm	Sulfate, ppm
R-10-001, Depth 1-5 ft	C708226	4572	7.60	-	-
R-10-001, Depth 16.5-20.0 ft	C708227	978	7.20	163	781
R-10-002, Depth 0.2-10.0 ft	C708228	2700	7.66	-	-
R-10-002, Depth 20-25 ft	C708248	394	5.14	778	6517
R-10-003 Depth 2-5 ft	C708268	2672	7.45	-	-
R-10-003 Depth 5-10 ft	C708269	1926	7.67	-	-

SEISMIC PARAMETERS AND LIQUEFACTION

The peak ground acceleration is estimated as 0.58g from the acceleration response spectrum (ARS) provided in the seismic design recommendation for this project by Hossain Salimi of the Office of Geotechnical Design-West. The seismic design recommendation is included in the Appendix D.

Liquefaction potential at the project site is high. Layers of very loose to medium dense sands which are present at the site to a depth of about 43 ft are subject to liquefaction during a design seismic event resulting in excessive settlement, which in turn causes downdrag load. The downdrag load varying from 80 to 135 kips is considered for design of pile foundation for the bridge. The range of anticipated seismically induced settlement due to liquefaction is about 3 to 4 inches.

AS-BUILT FOUNDATION DATA

The existing bridge is supported by Abutment 1, Piers 2 and 3, and Abutment 4. These supports are on 16”x16” concrete piles of 45 tons with tip elevation varying from -41 ft to -45 ft. Records of pile driving are not available to review.

FOUNDATION RECOMMENDATIONS FOR BRIDGE

Pile Type

Cast in Drilled Hole (CIDH) pile type was considered for this project to avoid the impact of ground vibration on the adjacent area associated with driven pile option. However, CIDH pile option was rejected due to use of pier walls in structure design scheme, difficulties of CIDH piles construction associated with caving potential of sand and very soft clayey deposits at the site, high groundwater, necessity of deep temporary casing, access conditions, and environmental impact with use of wet method.

The major drawback of the driven pile option is the vibration impact on the area adjacent to the project site. Driven pile option is feasible provided that vibration impact be minimized to a level acceptable to the adjacent facilities. Based on our past experienced, we recommend that vibration at the ground of the adjacent facilities do not exceed Peak Particle Velocity (PPV) of 0.2 in/sec (5 mm/sec). At this level, pile driving may not cause damage to the facilities by pre-drilling to the elevation of -21 ft. The pre-drill hole shall be at least 2/3 ft (200 mm) larger than the pile size to cut off the transmission of the surface waves generated due to driving energy to the surrounding soils. The need for temporary casing of all pre-drill holes shall be included in the project plans since the cohesionless materials present to the pre-drilling depth is subject to caving. The tip elevations of temporary casing are shown in Table 6. The plan should have a note that require temporary casing to be installed by rotation method to avoid vibration due to their driving impact. The annular space between the pile and temporary casing shall be filled with slurry concrete backfill when the temporary casing is withdrawn.

We recommend that District Design include the vibration monitoring special provisions for the project. The vibration provisions shall include inspection and documentation of the adjacent facility conditions and monitor and control the vibration PPV magnitude variation and maximum PPV values with the anticipated frequencies caused by the pile driving. We recommend adjacent area up to distance of 35 ft from the nearest pile driving location be considered for the vibration monitoring program.

Alternatively, vibration free pile option using Tubex method can be used. The recommendations below are provided for both options. We recommend that structural plans be prepared to allow use of either of these options.

Option 1- Driven Pile

We recommend Caltrans Class 200 Alternative “W” steel pipe pile with diameter of 16 inch, 0.5 inch minimum thick shell to support all Abutments and Piers of the 4-span bridge to be replaced. The general foundation information and design loads provided to us by the Structure Design West, Branch 16 are presented in Tables 2 and 3,

Table 2. General Foundation Information

Support No	Design Method	Pile Type	Finish Grade Elevation (ft)	Cut-off Elevation (ft)	Pile Cap Size (ft)		Permissible Settlement under Service Load (in)	No Piles Per Support
					B	L		
Abut. 1&5	WSD	Class 200-Alt "W"	16	-5.5	8.0	253	1	64
Piers 2&3	LRFD	Class 200-Alt "W"	0	-5.5	2.5	253	1	35
Pier 4	LRFD	Class 200-Alt "W"	0	-5.5	2.5	253	1	33

Table 3. Foundation Design Loads

Support No	Service-I Limit State (kips)			Strength Limit State (kips)				Extreme Event Limit State (kips)	
	Total Load		Permanent Load	Compression		Tension		Compression	Tension
	Per Support	Max. Per Pile	Per Support	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Max. Per Pile	Max. Per Pile
Abut. 1	6300	150	4950	N/A	N/A	N/A	N/A	N/A	N/A
Pier 2	5450	N/A	3700	7800	260	0	0	270	50
Pier 3	4900	N/A	3250	7000	235	0	0	270	50
Pier 4	5300	N/A	3600	7700	250	0	0	270	50
Abut. 5	6200	125	4900	N/A	N/A	N/A	N/A	N/A	N/A

Based on the above information, we have performed axial and lateral load pile capacity analyses. Tables 4 and 5 present our foundation recommendations for Abutments and Piers, respectively. All specified pile tip elevations presented in Pile Data Table 6 are controlled by strength limit compression.

Table 4. Foundation Design Recommendations for Abutments

Support	Pile Type	Cut-off Elevation (ft)	LRFD Service-I Limit State Load (kips) Per Support		Total Permissible Support Settlement (inches)	LRFD Service-I Limit State Total Load (kips) Per Pile (Compression)	Nominal Resistance (kips)	Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
			Total	Permanent						
Abut. 1	Class 200 Alt. “W”	-5.5	6300	4950	1	150	300	-75.5 (a) -57.5 (c) -66.0 (d)	-75.5	400
Abut. 5	Class 200 Alt. “W”	-5.5	6200	4900	1	150	300	-81.0 (a) -65.5 (c) -81.0 (d)	-81.0	435

Notes:

1. *Design tip elevations are controlled by: (a) Compression, (c) Settlement, and (d) Lateral Load.*

2. *The specified tip elevations shall not be raised.*

3. *The nominal driving resistance is equal to the nominal resistance plus driving resistance (downdrag) from the unsuitable penetrated soil layers (very soft clay and liquefiable medium dense sand).*

Table 5. Foundation Design Recommendations for Piers

Support	Pile Type	Cut-off Elevation (ft)	LRFD Service-I Limit State Load (kips) Per Support		Total Permissible Support Settlement (inches)	Required Factored Nominal Resistance (kips)				Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
						Strength Limit		Extreme Event				
			Total	Perm-anent		Comp. (ϕ=0.7)	Tension (ϕ=0.7)	Comp. (ϕ=1.0)	Tension (ϕ=1.0)			
Pier 2	Class 200 Alt. "W"	-5.5	5450	3700	1	260	0	270	50	-83.5 (a-I) N/A (b-I) -83.5 (a-II) -45.0 (b-II) -71.0 (c) -83.5 (d)	-83.5	460
Pier 3	Class 200 Alt. "W"	-5.5	4900	3250	1	235	0	270	50	-83.5 (a-I) N/A (b-I) -83.5 (a-II) -45.0 (b-II) -71.0 (c) -83.5 (d)	-83.5	460
Pier 4	Class 200 Alt. "W"	-5.5	5300	3600	1	250	0	270	50	-83.5 (a-I) N/A (b-I) -83.5 (a-II) -45.0 (b-II) -71.0 (c) -83.5 (d)	-83.5	460

Notes:

1. *Design tip elevations are controlled by: (a-I) Compression (Strength Limit), (b-I) Tension (Strength Limit), (a-II) Compression (Extreme Event), (b-II) Tension (Extreme Event), (c) Settlement, and (d) Lateral Load.*

2. *The specified tip elevations shall not be raised.*

3. *The nominal driving resistance is equal to the nominal resistance plus driving resistance (downdrag) from the unsuitable penetrated soil layers (very soft clay and liquefiable medium dense sand).*

Table 6: Pile Data Table

Support	Pile Type	Nominal Resistance (kips) Compression		Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance (kips)	Tip Elevation of 24-inch Diameter Temporary Casing (ft)
		Strength Limit	Extreme Event				
Abut. 1	Class 200 Alt. “W”	300	N/A	-75.5 (a) -57.5 (c) -66.0 (d)	-75.5	400	-21
Pier 2	Class 200 Alt. “W”	380	270	-83.5 (a) -45.0 (b) -71.0 (c) -83.5 (d)	-83.5	460	-21
Pier 3	Class 200 Alt. “W”	340	270	-83.5 (a) -45.0 (b) -71.0 (c) -83.5 (d)	-83.5	460	-21
Pier 4	Class 200 Alt. “W”	360	270	-83.5 (a) -45.0 (b) -71.0 (c) -83.5 (d)	-83.5	460	-21
Abut 5	Class 200 Alt. “W”	300	N/A	-81.0 (a) -65.5 (c) -81.0 (d)	-81.0	435	-21

Notes:

1. *Design tip elevations are controlled by: (a) Compression, (b) Tension, (c) Settlement, and (d) Lateral Load.*
2. *The specified tip elevations shall not be raised.*
3. *The nominal driving resistance is equal to the nominal resistance plus driving resistance (downdrag) from the unsuitable penetrated soil layers (very soft clay and liquefiable medium dense sand).*

Pile lateral analyses were performed for the project by using L-Pile computer program to obtain “critical” pile lengths and lateral capacities based on the deflection criteria of 0.25 inch. Results of lateral analyses for this pile type to support Abutments and Piers are presented in Table 7.

Table 7. Results of Pile Lateral Analyses

Support No	Pile Length (ft)	Lateral Capacity (kips)
Abut. 1	60.5	20.9
Piers 2,3,4	78.0	16.6
Abut. 5	75.5	17.7

Option 2- Vibration Free “Tubex” Pile

If the risk associated with the expected impact of pile driving vibration and noise is not acceptable, alternative piling by Tubex grouted injection piles may be used for the support of this structure to comply with the “free vibration” pile installation method to protect the complex building from damage during and after construction.

Tubex piles should have the axial and lateral capacities similar to the axial (nominal driving resistance) and lateral capacities of Class 200 Alt “W” Pile which are shown in Tables 6 and 7. The center to center spacing of these piles of more than 3.5 times pile diameter should be kept to minimize the axial group effect of piles. Piles should be protected from corrosion problem. Two performance tests at selected locations (Abutment 1 and Pier 4) and ten proof tests (two of production piles at each abutment and piers) shall be conducted for Tubex grouted injection piles. The pile shall be tested in compression to the Nominal Resistance Required. We recommend that the reaction piles shall have the same type and length as a test pile. The structural capacity of the pile and the test frame load capacity sufficiently exceed the required geotechnical capacity. Contractor(s) shall propose this alternative piling according with the project specifications.

FOUNDATION RECOMMENDATIONS FOR RETAINING WALLS

Soldier pile walls consisted of 50 ksi steel grade piles W14x233 with lagging are recommended for all RW (A, B, and C) to retain maximum 15 ft of materials. Soldier pile walls are designed with 250 psf surcharge load, which can be placed at least 3 ft from the wall face. H-Piles should be at least 43 ft long (28 ft embedment). Piles shall be placed vertically in 2.5 ft diameter pre-drilled holes and spaced 6 ft from center to center. Temporary casing should be used to prevent caving. Concrete shall be used to fill the holes with piles inside. If rock rip raps (Rock Slope Protection - RSP) is used as a support berm to reduce the wall height to maximum 15 ft as indicated above, the RSP should be embedded at least 2 ft below the existing channel bed elevation. The side slope of the RSP berm should be 1.5H to 1.0V (minimum).

FOUNDATION RECOMMENDATIONS FOR SOUNDWALLS

Soundwalls on barrier can be supported on Class 200 Alternative “Y” precast piles. The minimum pile lengths are 32 ft for SW1 and 36 ft for SW2. Piles shall be spaced 6 ft and 5.75 ft from center to center for SW1 and SW2, respectively. Before driving piles, pre-drilling from the ground surface to a depth of 8 ft is required to minimize vibration impact on the existing facilities. The pre-drill hole shall be at least 2/3 ft (200 mm) larger than the pile size to cut off the transmission of the surface waves generated due to driving energy to the surrounding soils. If PPV obtained from vibration monitoring exceeds 0.2 in/sec, pre-drilling should be revised for deeper depth. Temporary casing should be used to prevent caving. The annular space between the pile and temporary casing shall be filled with lean concrete slurry when the temporary casing is withdrawn.

FOUNDATION RECOMMENDATIONS FOR OVERHEAD SIGN

The proposed Overhead Sign Type V on median at Station 308+40 shall be supported by CIDH pile according to the Standard Plan. However, we recommend that CIDH pile has the diameter of 5 ft and the embedment length of 30 ft.

TEMPORARY SHORING

Use of temporary shoring is anticipated for the project and is responsibility of Contractor(s). The idealized soil profile for temporary shoring is presented in the following Table.

Table 8. Idealized Soil Profile

Depth, ft	Unit Weight, pcf	Friction Angle, degree	Cohesion, psf
0 to 15	110	28	0
15 to 20	115	31	0
20 to 30	120	30	0
30 to 45	125	34	0
45 to 53	120	0	200

Temporary shoring system proposed by Contractors should be reviewed by engineers before its initiation.

CONSTRUCTION CONSIDERATIONS

The temporary cut slope should be 1.5 H to 1.0 V or flatter. Groundwater is anticipated within the cut. At Abutments 1 and 5, the first 20 to 21 ft below the original ground surface will be excavated. The excavation should follow the Cal/OSHA excavation requirements. Control measure of groundwater should be considered during the excavation and construction.

Compaction of backfill materials should be conformed with the Section 19 of Standard Specifications. Behind the abutment backwalls, control low strength material is proposed to use. This material should have the maximum unit weight of 120 pcf not to cause the settlement.

Difficult driving and pile installation are anticipated due to the presence of very soft/very loose materials over dense/very stiff and gravel materials, and existing pile foundation. The Contractor(s) should perform driveability study and choose driving equipment and hammer size that are suitable to penetrate through these dense/very stiff and gravel materials to reach the specified tip elevations without inducing excessive stresses over the piles. The bearing value of piles driven at least to the specified tip elevations should be checked with the pile-driving formula given in Section 49-2.01A(4)(b) of the Caltrans Standard Specifications (2010) using the normal driving resistance and/or with a pile driving analyzer (PDA). At least one PDA is required at each Bent and Abutment to check the pile integrity and design capacity. Soil plug is anticipated for Class 200 Alternative “W” pipe pile. For Tubex grouted injection piles, water jetting provided that it is not disturbing the soil surrounding the piles is acceptable through the pile tip to penetrate the dense/very stiff layers during drilling to the specified pile tip elevation. The piling construction method shall be suitable for high groundwater and caving conditions which are anticipated during installation of all piles. Furthermore, temporary casing and wet method may be needed for CIDH pile installation. Contractors are responsible for these issues. Contractor(s) should refer to the LOTB and laboratory test data for soil types and properties.

DISCLAIMER AND CONTACT INFORMATION

The recommendations contained in this report are based on specific project information regarding structure, type and location. If any conceptual changes are made during final project design, the Office of Geotechnical Design – West, Design Branch C should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Tung Nguyen, 510-622-1775 or Mahmood Momenzadeh, 510-286-5732, at the Office of Geotechnical Design-West, Branch C.

c: TPokrywka, MMomenzadeh, TNguyen, HSalimi, CRisden, RNashed, Daily File, Route File, Translab File, Reto Schaerli, PCE-PPRM, Project Manager, District Design Chief

TNguyen/mm

APPENDIX A

SITE GEOLOGY

Memorandum

Flex your power!
Be energy efficient!

To: MR. MAHMOOD MOMENZADEH
Chief, Branch C
Office of Geotechnical Design – West

Date: October 18, 2010

Attention: T. Nguyen

File: 04-SM-101 PM 0.0
04 – 235621
San Francisquito Creek Br.

From: RIFAAT NASHED RN
Engineering Geologist
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

GRANT WILCOX GW
Chief, Branch B
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject: Foundation Report (Geology & Subsurface Conditions)

This memo is in response to your request to provide the geology and subsurface conditions required to prepare the Foundation Report for the proposed bridge replacement (Structure No. 35-0013).

Site Geology and Subsurface Conditions

Topography

San Francisquito Creek drains from west to east towards San Francisco Bay. The approximate elevation of the project site ranges from 16 feet (at the west side) to 14 feet (at the east side).

Site Geology

The project site is located at the southeastern margin of the San Francisco Peninsula, which is a part of northwest-trending California Coast Ranges. The eastern margin of the peninsula is influenced by the tidal action of San Francisco Bay, and underlain predominantly by Holocene and Pleistocene deposits of unconsolidated basin and alluvial deposits, and Bay Mud overlay older rocks the lower Cretaceous/ Jurassic Franciscan complex

The project area is entirely covered by Holocene floodplain deposits (See the attached Geology map). The floodplain deposits contains very medium to dark-grey, dense, sandy to silty clay. Lenses of coarser material (silt, sand, and pebbles) may be locally present (USGS, OFR 98-231). Natural Levee deposits to the west and Flood basin deposits to the east surround the project site. The Natural Levee deposits contain loose, moderate-to well-sorted sandy or clayey silt grading to sandy or silty clay. The Flood basin deposits contain organic-rich clay to very fine silty-clay deposits occupying the lowest topographic positions between Holocene Levee deposits or Holocene floodplain deposits.

The Franciscan complex forms the basement rock underlies the entire area east of the Pilarcitos Fault. The Franciscan complex is composed of weakly to strongly metamorphosed greywacke, argillite, limestone, basalt, serpentinite, chert, and other rocks. The Franciscan rocks in this area overlain by Upper Jurassic to Upper Cretaceous turbidites (USGS, OFR 98-348).

The project site is located 3.9 miles (6.3 km) north of the Cascade Fault, 6.4 miles (10.34 km) west of the Silver Creek Fault, and 7.4 miles (11.87 km) east of the San Andrea Fault (Peninsula section). San Andrea Fault, Silver Creek Fault, and Cascade Fault are active faults with Maximum Magnitude (MMax) of 7.9, 7.1, and 6.9 in order.

Subsurface Condition

Recent three boreholes, R-010-001 and R-010-002 (at the N/B) and R-010-003 (at the S/B) were drilled in August 2010, for the proposed bridge replacement . The maximum exploration depth reached to the depth of 100 ft. The foundation material encountered at eastern side (N/B shoulder) can be described as follows: 10 feet medium stiff sandy clay to clay, underlain by 65 feet of very loose to medium dense sand with silt and gravel, followed by 15 feet stiff clay and 10 feet stiff silt and silty sand. The foundation material encountered at western side (S/B shoulder) can be described as follows: 10 feet of very stiff to soft silty clay; 15 feet very soft clay, underlain by 20 ft medium dense sand and silty sand; 15 feet soft clay and silt; underlain by medium dense 15 feet of medium dense silty sand and stiff sandy clay; followed by 15 feet stiff to very stiff clay and silty clay and 10 feet of medium dense silty sand.

Groundwater elevation

Groundwater was encountered during the investigation and measured at depth ranging from 13.5 to 14.0 ft below the ground surface in August 2010.

If you have any questions or need additional information, please call Rifaat Nashed at (510) 622-1773 or Grant Wilcox at (510) 286-4835.

c: TPokrywka, GWilcox, Route File, Daily File

RNashed/mm

Memorandum

Flex your power!
Be energy efficient!

To: MR.MAHMOOD MOMENZADEH
Chief, Branch C
Office of Geotechnical Design – West

Attention: T Nguyen

Date: August 31, 2012

File: 04-SM-101 PM 0.0
04-235620
San Francisquito Creek
Earth Retaining Systems

From: RIFAAT NASHED RN
Engineering Geologist
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

CHRIS RISDEN CR
Acting Chief, Branch B
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject : Geotechnical Design Report (Geology, Seismicity , Soils & Subsurface Condition Part)

This memo is in regards to your request to provide the Physical Setting, Geology, Seismicity, Soils and Subsurface conditions on the project area at Hwy 101, San Francisquito Creek Bridge (see the attached Location Map).

PHYSICAL SETTING

Climate

The climate in the project area is representative of the northern coast of California. Winters are mild and wet; summers are cool nearly rainless (USDA, 1961). The average annual rainfall is 19.95 inches. Temperatures are rather mild, the average January minimum temperature is 39.6°F, and the average July maximum temperature is 82.5°F (Northern California Climate Summaries)[1].

Topography and Drainage

San Francisquito Creek flows northeastward for 14 miles from its source below Searsville Lake to its terminus in San Francisco Bay[2]. In its lower reaches, the creek courses through densely populated cities located in relatively flat-lying areas. The ground surface elevation at the west side of the project site, where the soldier pile wall SPW and the three sound walls SW1, SW2 & SW3 are proposed, is approximately 16 feet. The ground surface elevation at the east side of the project site, where the solider pile walls RT and SPE are proposed, is approximately 14 feet [3].

1 http://www.wrcc.dri.edu/summary/climsmnca.html
2 (http://geography.wr.usgs.gov/sfcreek/study_area.html)
3 (http://pi.dot.ca.gov/upload/dist4-04-235621-6.26.2012-11.20)

Regional Geology and Seismicity

The San Francisquito Creek is the last riparian free-flowing urban creek on the southern Peninsula of San Francisco Bay. The creek begins as overflow from the Searsville Lake dam, located in the Santa Cruz Mountains, which are part of the larger Coast Ranges.

The project site lies on the alluvial plain on the southeastern margin of the San Francisco Peninsula, which is a part of northwest-trending California Coast Ranges. The eastern margin of the peninsula is influenced by the tidal action of San Francisco Bay, and is underlain predominately by Holocene and Pleistocene deposits of unconsolidated basin and alluvial deposits, and bay mud that overlay older rocks of the lower Cretaceous/ Jurassic Franciscan complex.

The Franciscan complex forms the basement rock and underlies the entire area east of the Pilarcitos Fault. The Franciscan complex is composed of weakly to strongly metamorphosed greywacke, argillite, limestone, basalt, serpentines, chert, and other rocks. The Franciscan rocks in this area are overlain by Upper Jurassic to Upper Cretaceous turbidities (USGS, OFR 98-348).

The Project area is surrounded by many active faults. The Silver Creek Fault is located east and the Cascade Fault is located south of the project area. The Monte Vista – Shannon Fault is situated southwest and the San Andreas Fault (peninsula section) west of the project area (see the attached Fault Map).

Site Geology

The project area is entirely covered by Holocene floodplain deposits (see the attached Geology Map). These flood plain deposits contain medium to dark- grey, dense, sandy to silty clay. Lenses of coarser material (silt, sand, and pebbles), may be locally present (USGS, OFR 98-231). Natural levee deposits to the west and flood basin deposits to the east surround the project site. The natural levee deposits contain loose, moderate-to well sorted sandy or clayey silt grading to sandy or silty clay. The flood basin deposits contain organic- rich clay to very fine silty-clay deposits occupying the lowest topographic positions between Holocene Levee deposits or Holocene Floodplain deposits.

Project Site Seismicity

The San Francisco Bay Area is highly seismically active, and several active faults lie within a few miles of the site. The Silver Creek Fault, with a maximum magnitude (MMax) = 7.1 is situated 6.9 miles east of the project site. The Cascade Fault with a maximum magnitude

(MMax) = 6.9 is situated 6.4 miles south the project site. The Monte Vista – Shannon Fault with a maximum magnitude (MMax) = 6.7 is situated 5.6 miles southwest the project site. The San Andreas Fault (Peninsula Section) with a maximum magnitude (MMax) = 7.9 is situated 7.4 miles west the project site.

Following is a table listing of the distance from the project to nearby active faults, the Maximum Magnitude of these faults, estimated Deterministic Peak Bed Rock Acceleration (PBA), and probabilistic USGS 5% in 50 years hazard anticipated within the project area using the Caltrans ARS online (attached) using the Shake program:

Fault	Site To Source Distance (Mile)	Maximum Magnitude (M_{max})	Peak Bed Rock Acceleration (PBA)	USGS 5% in 50,years Probability Exceedance
Monte Vista – Shannon fault	5.6	6.7	0.36*	0.51
Cascade fault	6.4	6.9	0.36	
Silver Creek fault	6.9	7.1	0.35	
San Andreas fault	7.4	7.9	0.31	

(*) Attenuation curve by Mualchin and Jones (1992)

According to the Shake program there is no governing fault, because the probabilistic value is higher than the deterministic values.

It should be noted that a detailed seismic report will be prepared by Hossain Salimi, Senior Materials and Research Engineer of Geotechnical Design – West Office.

Ground Rupture

The project area is not intersected by any known active faults.

Ground Motions

According to the Association of Bay Area Governments (ABAG) 2003, the Shaking Intensity Map (see the attached Ground Shaking Map) indicates that the project site is classified as having "very strong level of shaking".

Liquefaction: According to the Association of Bay Area Government (ABAG) 2003, the Liquefaction Hazard Level Map (see the attached Liquefaction Map) indicates that the project site is classified as having "high to moderate level of liquefaction". Boreholes No. R-10-001 and R-10-002 indicate the presence of very loose to medium dense sand below the groundwater surface at relatively shallow depth.

Soils

According to *the United States Department of Agriculture, Soil survey San Mateo Area County, Eastern Part and San Francisco County, California Report, 1991*. The northwestern part of the project area is covered by Urban land, where more than 85% of the surface is covered by asphalt, concrete, buildings, and other structures. Include in this soil are small area of Orthents, cut and fill.

The southwest part of the project area is covered by Urban land-Orthents, cut and fill complex, 0 to 5 percent slope. This soil is on coastal terrace and alluvial fans. This soil is 50% Urban land, and 45% Orthnets, and cut and fill. Urban land consists of areas that are covered by asphalt, concrete, building, and other structures. The material covered by these structures consists of soils that are similar to the Orthents. The Orthents consist of soils that have been cut and filled for urban development, such as the construction of roads and buildings. The Orthents soils dominantly are deep and are loam or clay loam. Included in this soil are small areas of Botella soils; Orthents, reclaimed; Sirdrak soils; and deep alluvial soils that are loam or fine sandy loam throughout. Also, included are small areas of deep, dark alluvial soils that are clay and clay loam throughout.

Surface water and erosion

The properties and characteristics of the Orthents are highly variable because of the differences in the kind and amount of fill material used. Run-off is slow, and the hazard of water erosion is slight. Excavation for roads and buildings increases the risk of erosion. Re-vegetating disturbed areas around construction sites as soon as possible helps to control erosion.

EXPLORATION

Drilling and sampling

Three wet rotary borings (R-10- 001, R-10 - 002 & R-10 - 003) and two CPT borings (CPT-10-001 & CPT-10-002) were drilled in August 2010 to a maximum depth of more than 100 ft for the purpose of replacing the existing San Francisquito Bridge. The wet rotary borings were drilled by using Mobile B47drill rig.

Boring numbers R-10-001and R-10-002 are located at the northbound shoulder where the Soldier pile Walls RT and SPE are located. Borings number R-10-003, CPT-10-001 and CPT-10-002 are located at the southbound shoulder where the soldier pile Walls SPW and soundwalls SW1, SW2 and SW3 are located.

Selected samples were obtained from 2.5 –inch I.D (modified California, MC) undisturbed samples and 1.4 inch I.D. (Standard Penetration Test, SPT) samples at various depths for mechanical, plasticity and moisture content analyses. The samplers were driven into subsurface soils under the impact of a semi- automatic, 140-pound hammer having a free fall of 30 inches. The blow counts are presented on the Log of Test Boring (LOTB). Also, five bulk samples were collected for the purpose of corrosion tests. A total of 47 samples for mechanical analysis, 38 samples for plasticity test, 55 samples for moist determination and 5 samples for corrosion test were sent to the lab.

As-built records show, four borings (B-1, B-2 B- 3 & B-4) were drilled in 1953 to a maximum depth of about 90 ft. These borings were drilled as part of the construction of the San Francisquito Bridge. Boring number B-3 located at the northbound shoulder where the soldier pile walls RT and SPE are located. Boring numbers B-1, B-2 and B-4 are located at the southern side of the bridge where the soldier pile walls SPW and soundwalls SW1, SW2 and SW3 are located. The groundwater in borehole number B-3 at 1.2 ft elevation was measured in February 1953.

Subsurface Conditions

Based on the recent borings R-10-001, R-10-002, and R-10-003, the foundation material encountered at eastern side (N/B shoulder), where walls RT and SPE are located, can be described as follows: 10 feet medium stiff sandy clay to clay, underlain by 65 feet of very loose to medium dense sand with silt and gravel, followed by 15 feet stiff clay and 10 feet stiff silt and silty sand. The foundation material encountered at the western side (S/B shoulder) where walls SPW a SW1, SW2 and SW3 are located, can be described as follows: 10 feet of very stiff to soft silty clay; 15 feet very soft clay, underlain by 20 ft medium dense sand and silty sand; 15 feet soft clay and silt; underlain by 15 feet of medium dense silty sand and stiff sandy clay; followed by 15 feet stiff to very stiff clay and silty clay and 10 feet of medium dense silty sand.

Groundwater

Groundwater was encountered during the investigation and identified by the driller at 1.5 ft and 1.1 ft elevations and depths ranging from 13.0 ft (at borehole # R-10-002) to 14.0 ft (at borehole # R-10-001) below the ground surface in August 2010.

Corrosion

Five bulk samples from the three boreholes (R-10-001, R-10-002 & R-10-003) at different depths were tested for corrosion, two of them are corrosive with their resistivity value ranges between 397 and 978 (< 1000 Ohm) and the pH-value of one these samples is 5.14 (< 5.5).

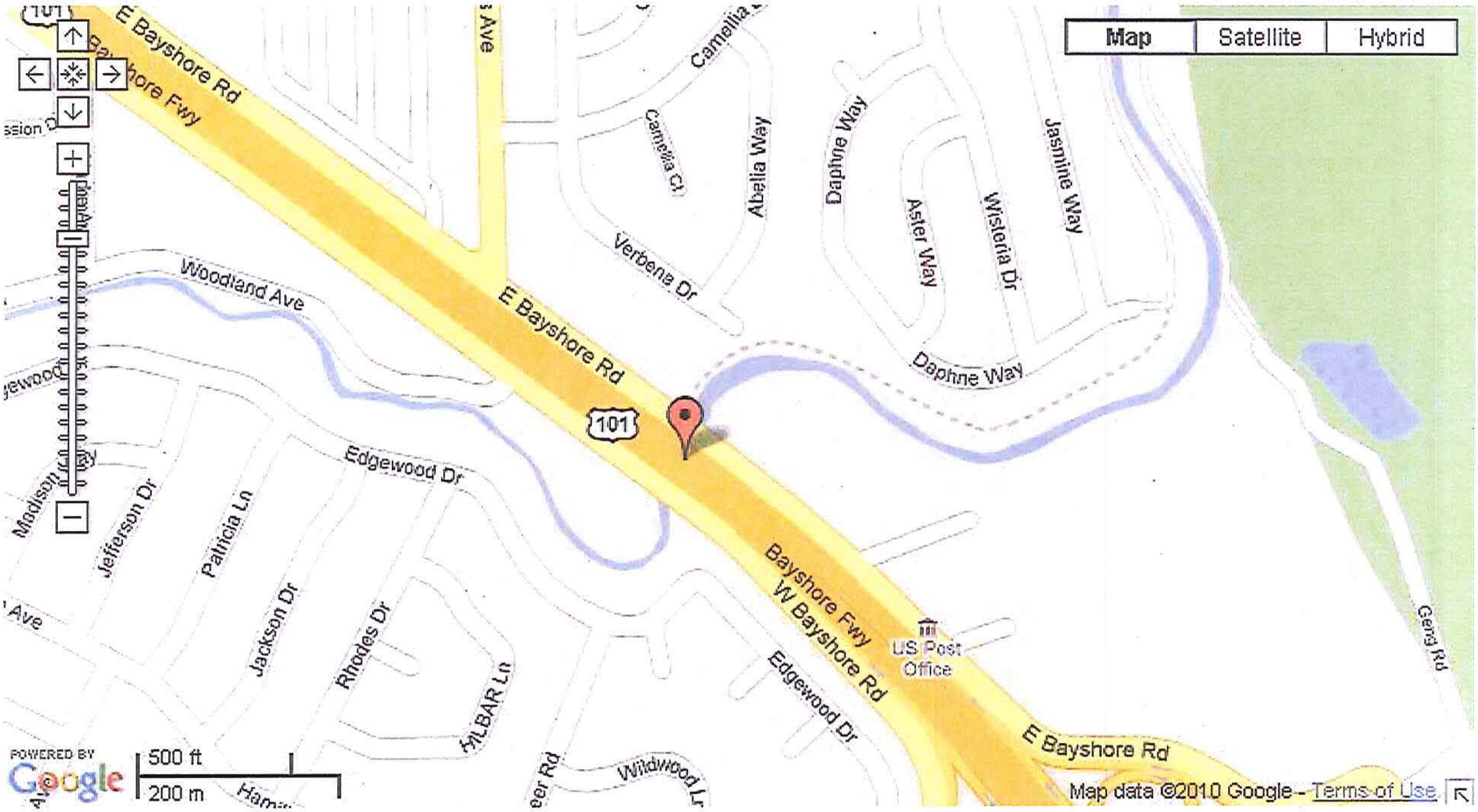
Scour

Based on the Structures Final Hydraulic Report for San Francisquito Creek, prepared on May31, 2012, the anticipated short term local scour depth at all substructure elements is 6.3 feet, reaching an elevation of -3.3 ft.

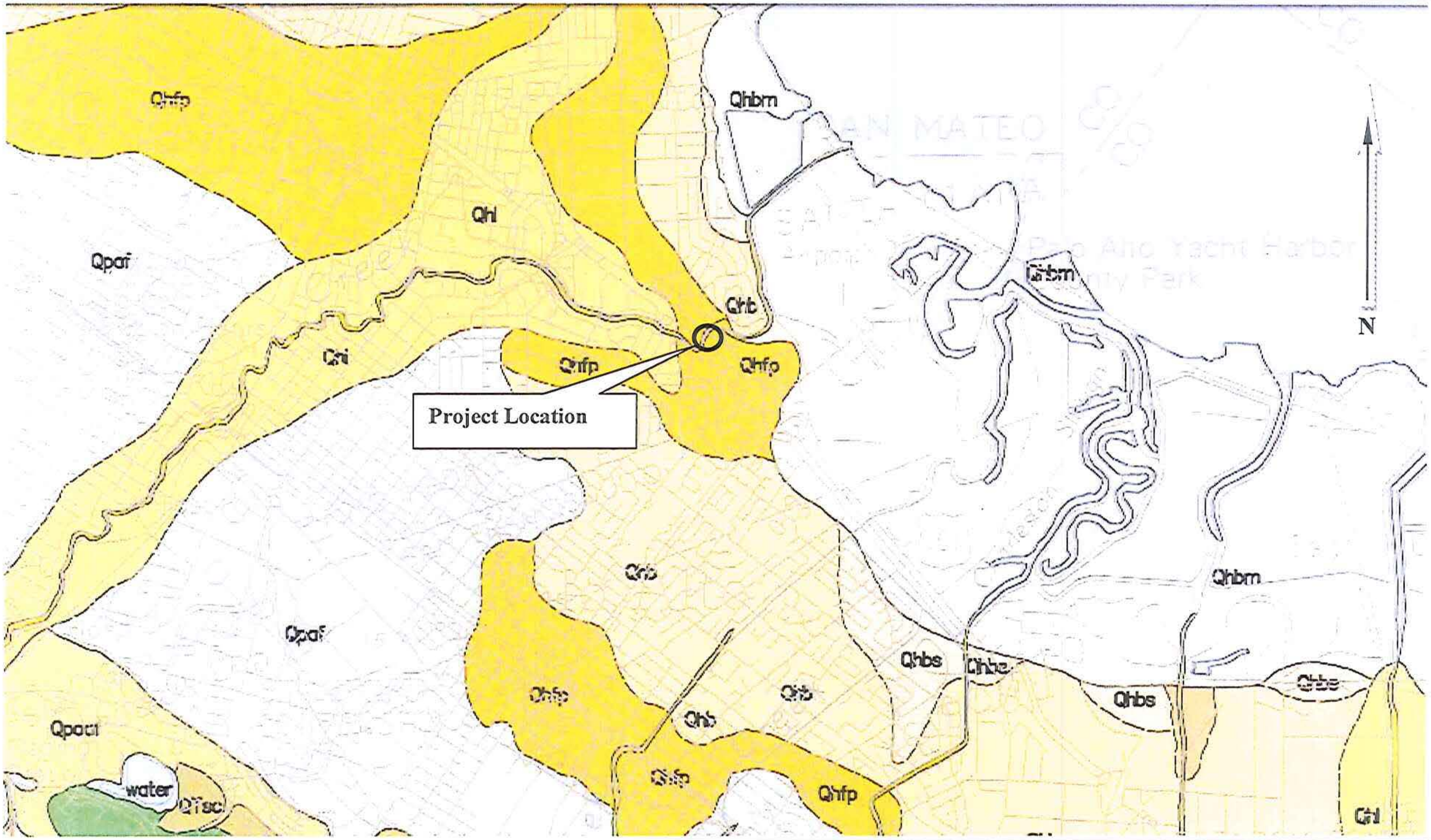
If you have any questions or need additional information, please call Rifaat at (510) 622-1773 or Chris Risden at (510) 622-8757.

c: TPokrywka, CRisden, Route File, Daily File.

RNashed/mm



Location Map	
04-SM-101	PM 0.0
EA 235621	August, 2012



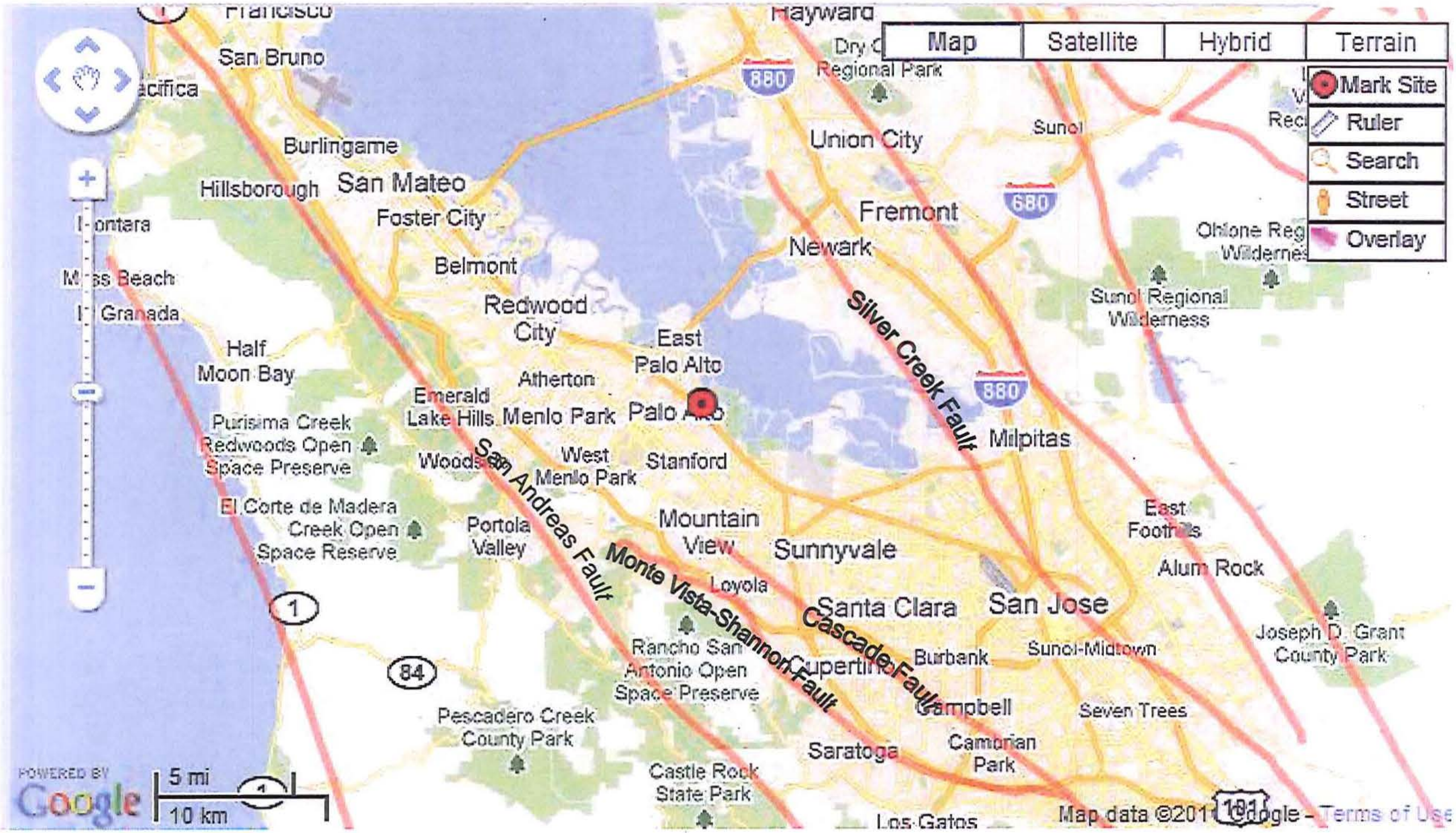
Source:
"Quaternary Geology of Santa Clara Valley, Santa Clara, Alameda, and San Mateo Counties, California."
By E.J Helley, R.W. Graymer G.A., P.K. Showalter,and C. M. Wentworth, May 1994

Scale 1: 50,000

Caltrans

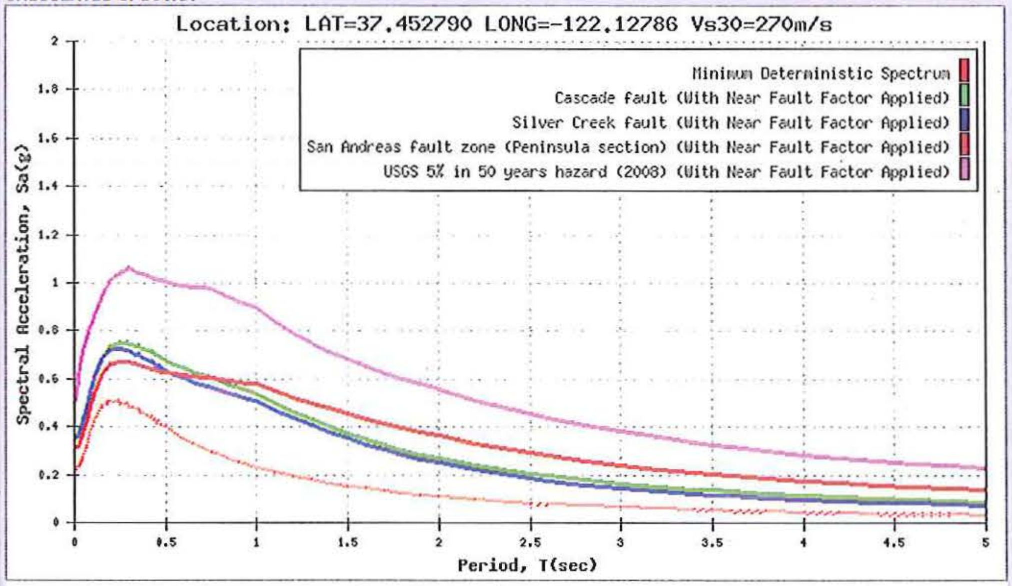
Geology Map

04-SM-101	PM 0.0
EA 235621	August, 2012



	Fault Map	
Caltrans	04-SM-101 EA 235621	PM 0.0 August, 2012

CALCULATED SPECTRA



View Tabular Data | Show Envelope Only | Hide Near Fault Adjustment | Axis Scale

Printer Friendly View | Show Basin Factor

Apply Near Fault Adjustment To:

NOTE: Caltrans SDC requires application of a Near Fault Adjustment factor for sites less than 25 km (Rrup) from the causative fault.

☑ Deterministic Spectrum Using

6.30 Km Cascade fault

10.34 Km Silver Creek fault

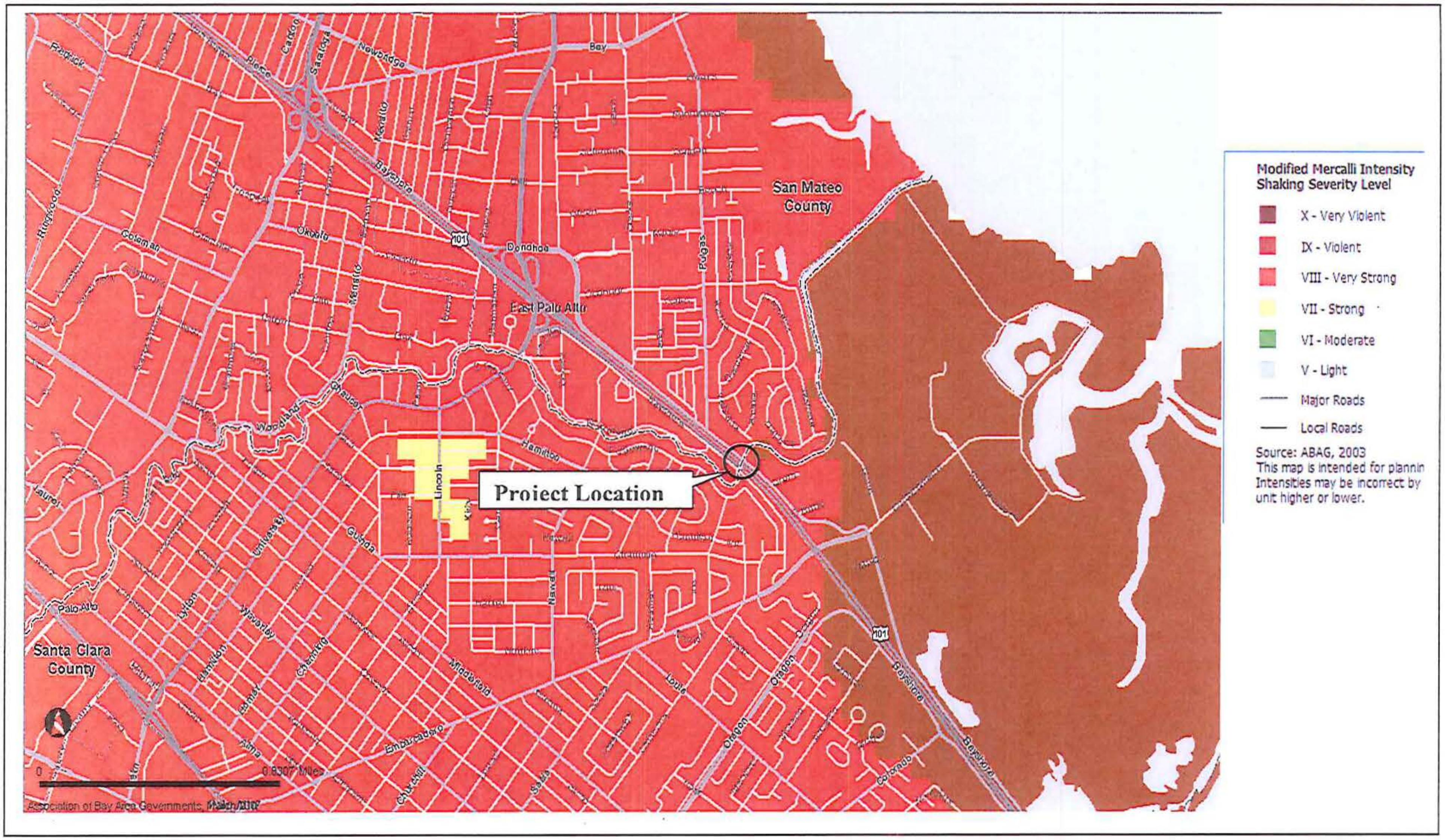
11.86 Km San Andreas fault zone (Peninsula section)

☑ Probabilistic Spectrum Using

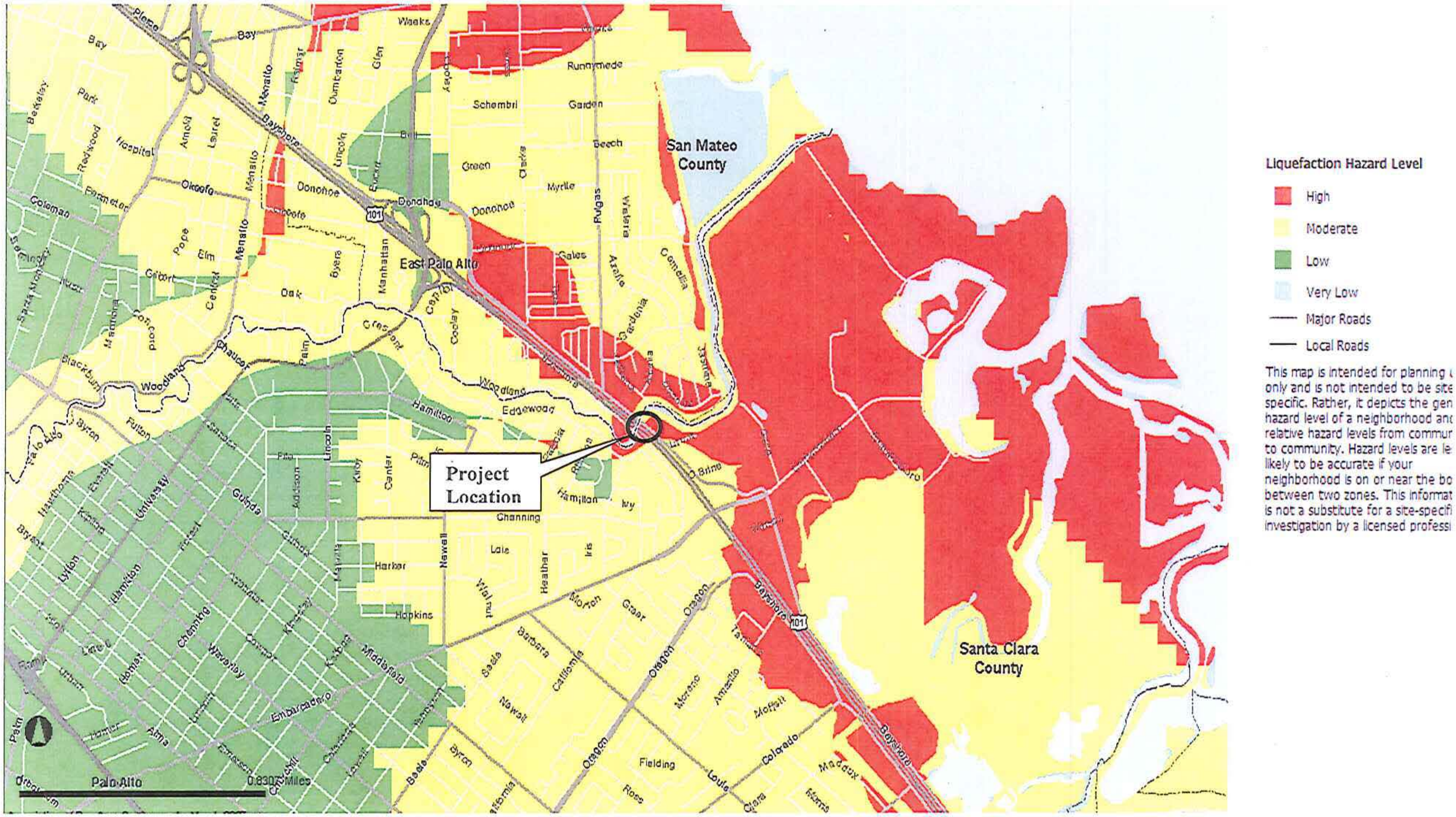
6.30 Km (Recommend Performing Deaggregation To Verify)

◉ Show Spectrum with Adjustment Only

○ Show Spectrum with and without near fault Adjustment



	Ground Shaking Map	
Caltrans	04-SM-101 EA 235621	PM 0.0 August, 2012



Liquefaction Map

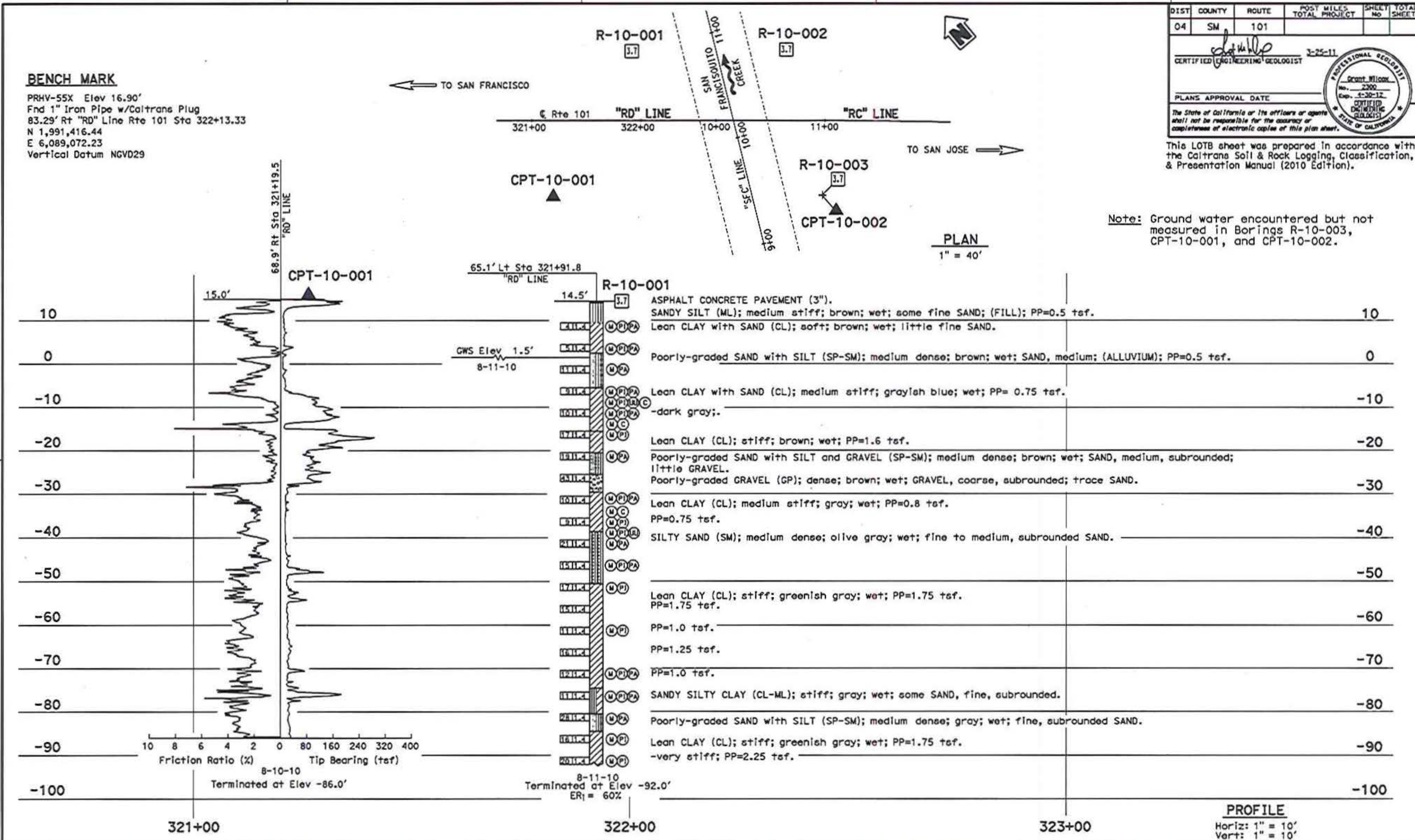
Caltrans

04-SM-101 PM 0.0
EA 235621 August, 2012

APPENDIX B

LOG OF TEST BORINGS

(FOR LEGENDS, SEE 2010 STANDARD PLANS A10F AND A10G)



ENGINEERING SERVICES		GEOTECHNICAL SERVICES	
FUNCTIONAL SUPERVISOR	DRAWN BY: C. Christian / W. Tang 01/11	FIELD INVESTIGATION BY:	
NAME: M. Momenzadeh	CHECKED BY: D. Nesbitt	T. Nguyen	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH

BRIDGE NO. 35-0348
POST MILES 0.01

SAN FRANCISQUITO CREEK BRIDGE (REPLACE)
LOG OF TEST BORINGS (1 OF 3)

DES GEOLOGIST LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04
EA 235621 (0400000678)

DISREGARD PRINTS BEARING EARLIER REVISION DATES

SHEET 31 OF 33

FILE => 35-0348-z-lt b01.dgn

USERNAME => s135156 DATE PLOTTED => 31-OCT-2012 TIME PLOTTED => 16:15

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SM	101			

CERTIFIED ENGINEERING GEOLOGIST 3-25-11

PROFESSIONAL GEOLOGIST Grant Wilcox No. 2300 Exp. 4-30-12 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

PLANS APPROVAL DATE

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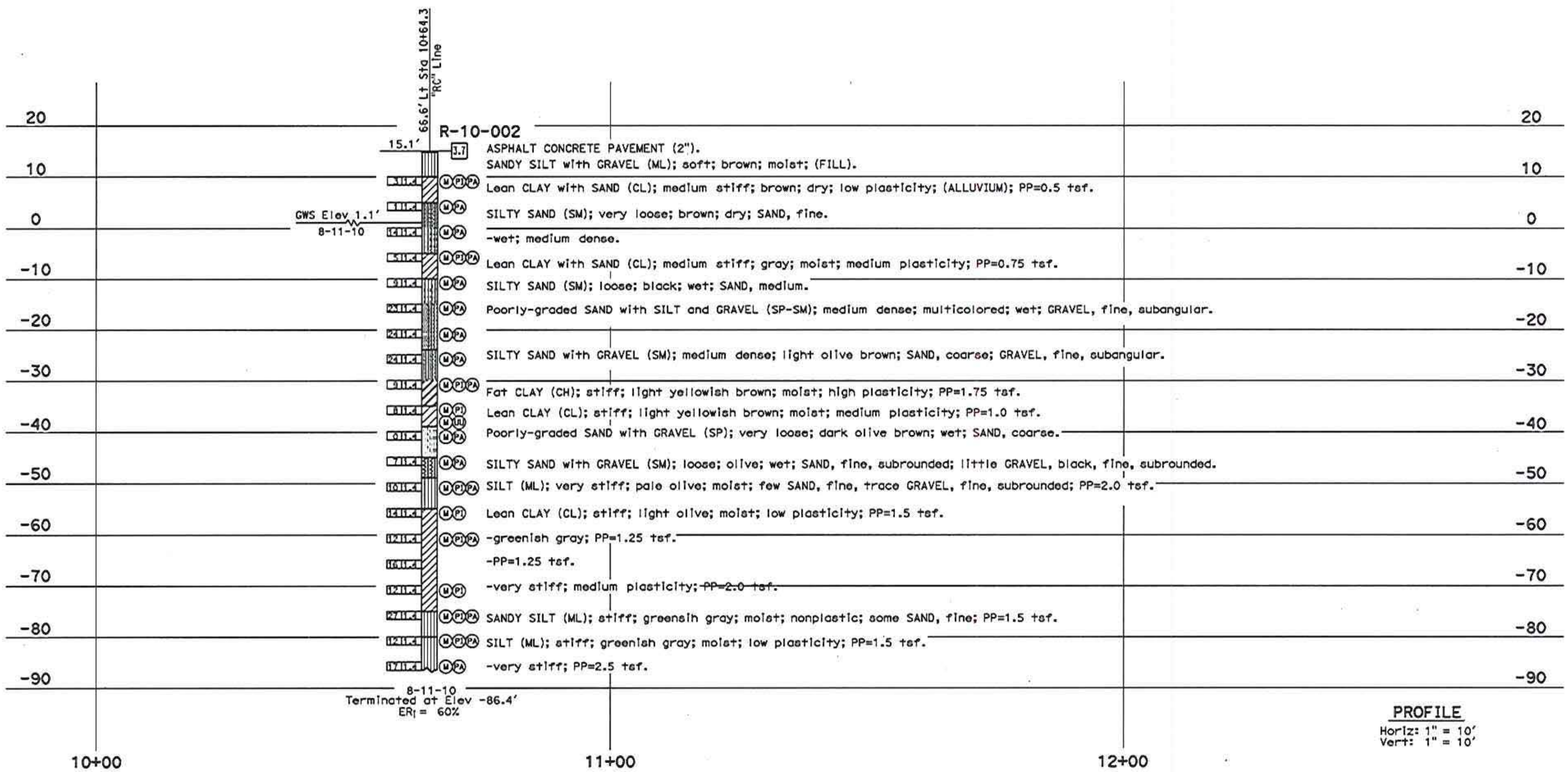
FOR PLAN VIEW, SEE "LOG OF TEST BORINGS 1 OF 3"



PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

ENGINEERING SERVICES		GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 35-0348	SAN FRANCISQUITO CREEK BRIDGE (REPLACE)
FUNCTIONAL SUPERVISOR NAME: M. Momenzadeh	DRAWN BY: C. Christian / W. Tang 01/11 CHECKED BY: D. Nesbitt	FIELD INVESTIGATION BY: R. Noshed		DESIGN BRANCH	POST MILES 0.01	LOG OF TEST BORINGS (2 OF 3)
DES GEOLOGIST LOG OF TEST BORINGS SHEET		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3		CU 04 EA 235621 (0400000678)	DISREGARD PRINTS BEARING EARLIER REVISION DATES	SHEET 32 OF 33

FILE => 35-0348-z-ltb02.dgn

USERNAME => s135156 DATE PLOTTED => 31-OCT-2012 TIME PLOTTED => 16:15

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SM	101			

CERTIFIED ENGINEERING GEOLOGIST 3-25-11

PLANS APPROVAL DATE

Grant Wilcox No. 2300 Exp. 4-30-12 CERTIFIED ENGINEERING GEOLOGIST PROFESSIONAL GEOLOGIST STATE OF CALIFORNIA

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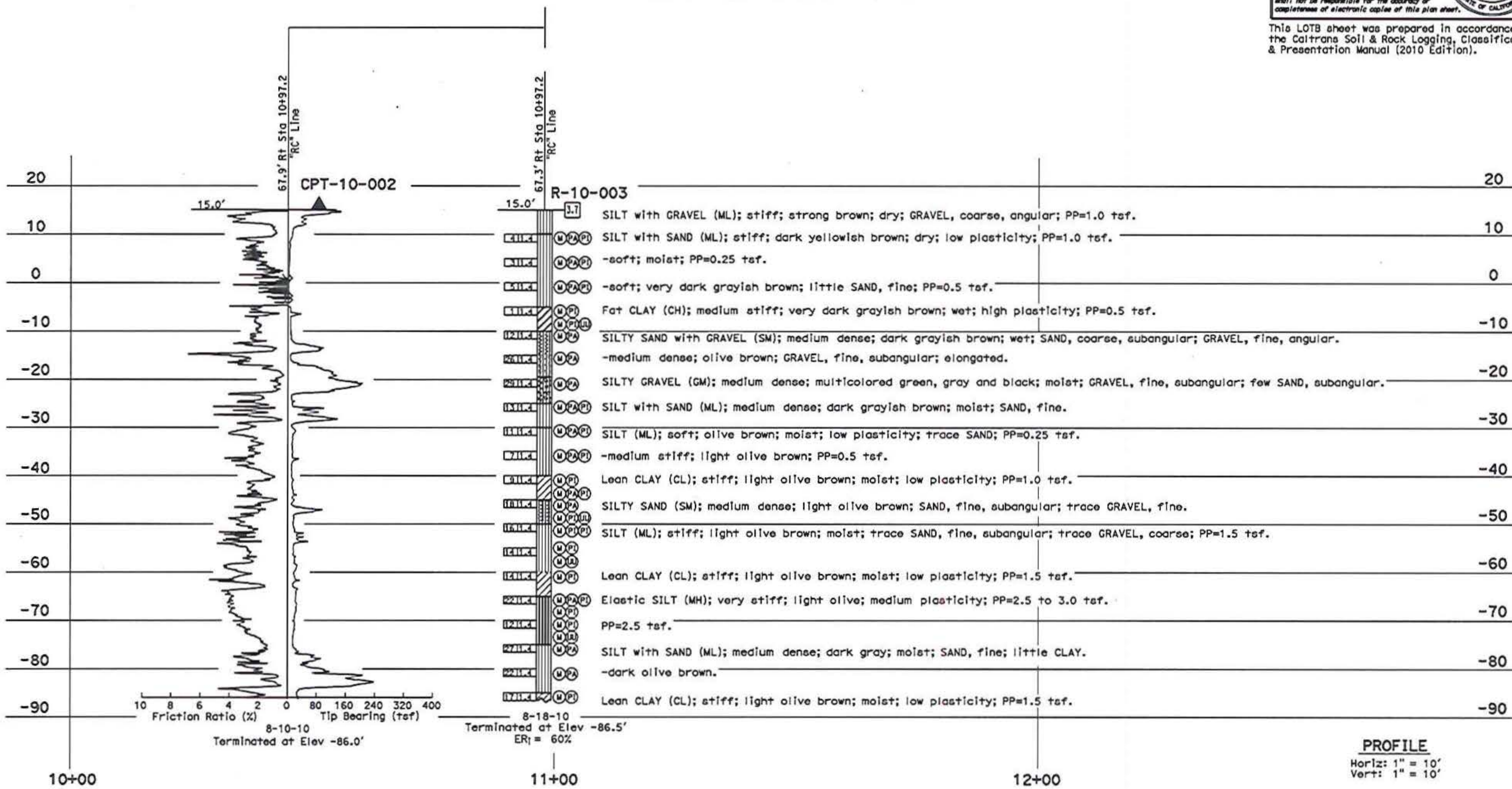
FOR PLAN VIEW, SEE "LOG OF TEST BORINGS 1 OF 3"



PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

ENGINEERING SERVICES		GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 35-0348	SAN FRANCISQUITO CREEK BRIDGE (REPLACE)
FUNCTIONAL SUPERVISOR NAME: M. Momenzadeh	DRAWN BY: C. Christian / W. Tang 01/11 CHECKED BY: D. Nesbitt	FIELD INVESTIGATION BY: R. Nashed		DESIGN BRANCH	POST MILES 0.01	LOG OF TEST BORINGS (3 OF 3)

GGS GEOLOGIST LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04
EA 235621 (0400000678)

DISREGARD PRINTS BEARING EARLIER REVISION DATES

SHEET 33 OF 33

FILE => 35-0348-z-ltb03.dgn

USERNAME => s135156 DATE PLOTTED => 31-OCT-2012 TIME PLOTTED => 16:15

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SM	101			

10-5-12
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST
Christopher Risden
No. 2541
Exp. 9-30-15
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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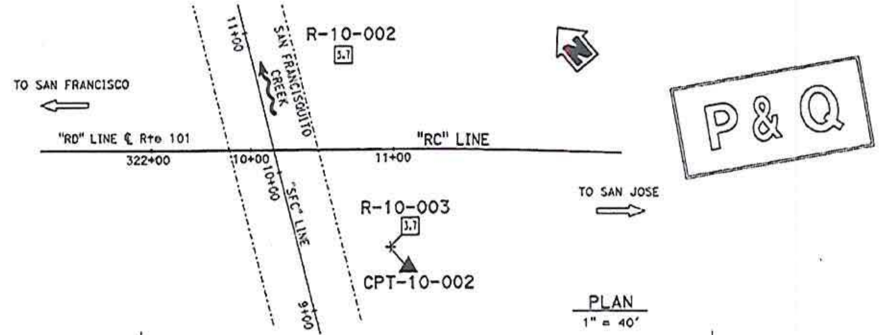
See 2010 Standard Plans A10F and A10G for Soil Legend, and A10H for Rock Legend.

BENCH MARK

PRHV-55X Elev 16.90'
Fnd 1" Iron Pipe w/Caltrans Plug
83.29' Rt"RD" Line Rte 101 Sta 322+13.33
N 1,991,416.44
E 6,089,072.23
Vertical Datum NGVD29



PLAN
1" = 40'

R-10-002

66.6' Lt Sta 10+64.3 "RC" Line

15.1'

GWS Elev 1.1'
8-11-10

- ASPHALT CONCRETE PAVEMENT (2").
- SANDY SILT with GRAVEL (ML); soft; brown; moist; (FILL).
- Lean CLAY with SAND (CL); medium stiff; brown; dry; low plasticity; (ALLUVIUM); PP=0.5 tsf.
- SILTY SAND (SM); very loose; brown; dry; SAND, fine.
- -wet; medium dense.
- Lean CLAY with SAND (CL); medium stiff; gray; moist; medium plasticity; PP=0.75 tsf.
- SILTY SAND (SM); loose; black; wet; SAND, medium.
- Poorly-graded SAND with SILT and GRAVEL (SP-SM); medium dense; multicolored; wet; GRAVEL, fine, subangular.
- SILTY SAND with GRAVEL (SM); medium dense; light olive brown; SAND, coarse; GRAVEL, fine, subangular.
- Fat CLAY (CH); stiff; light yellowish brown; moist; high plasticity; PP=1.75 tsf.
- Lean CLAY (CL); stiff; light yellowish brown; moist; medium plasticity; PP=1.0 tsf.
- Poorly-graded SAND with GRAVEL (SP); very loose; dark olive brown; wet; SAND, coarse.
- SILTY SAND with GRAVEL (SM); loose; olive; wet; SAND, fine, subrounded; little GRAVEL, black, fine, subrounded.
- SILT (ML); very stiff; pale olive; moist; few SAND, fine, trace GRAVEL, fine, subrounded; PP=2.0 tsf.
- Lean CLAY (CL); stiff; light olive; moist; low plasticity; PP=1.5 tsf.
- -greenish gray; PP=1.25 tsf.
- -PP=1.25 tsf.
- -very stiff; medium plasticity; PP=2.0 tsf.
- SANDY SILT (ML); stiff; greensih gray; moist; nonplastic; some SAND, fine; PP=1.5 tsf.
- SILT (ML); stiff; greenish gray; moist; low plasticity; PP=1.5 tsf.
- -very stiff; PP=2.5 tsf.

8-11-10
Terminated at Elev -86.4'
ER_i = 60%

Elevations: 20, 10, 0, -10, -20, -30, -40, -50, -60, -70, -80, -90

Stations: 10+00, 11+00, 12+00

PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

ENGINEERING SERVICES		MATERIALS AND GEOTECHNICAL SERVICES
FUNCTIONAL SUPERVISOR	DRAWN BY: I.G-Remmen	FIELD INVESTIGATION BY:
NAME: M. Momenzadeh	CHECKED BY: D. Nesbitt	R. Nashed

GDS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 16

BRIDGE NO. RETW
POST MILE 0.01

RETAINING WALL A, B & C
LOG OF TEST BORINGS 1 OF 2

UNIT: 3643
PROJECT NUMBER & PHASE: 04000006781
CONTRACT NO.: 04-235621

DISREGARD PRINTS BEARING EARLIER REVISION DATES

SHEET 7 OF 8

FILE => 35-ret wall-z-1tb01.dgn

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	101			

10-5-12

CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST Christopher Risden No. 2541 Exp. 9-30-13 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

PLANS APPROVAL DATE

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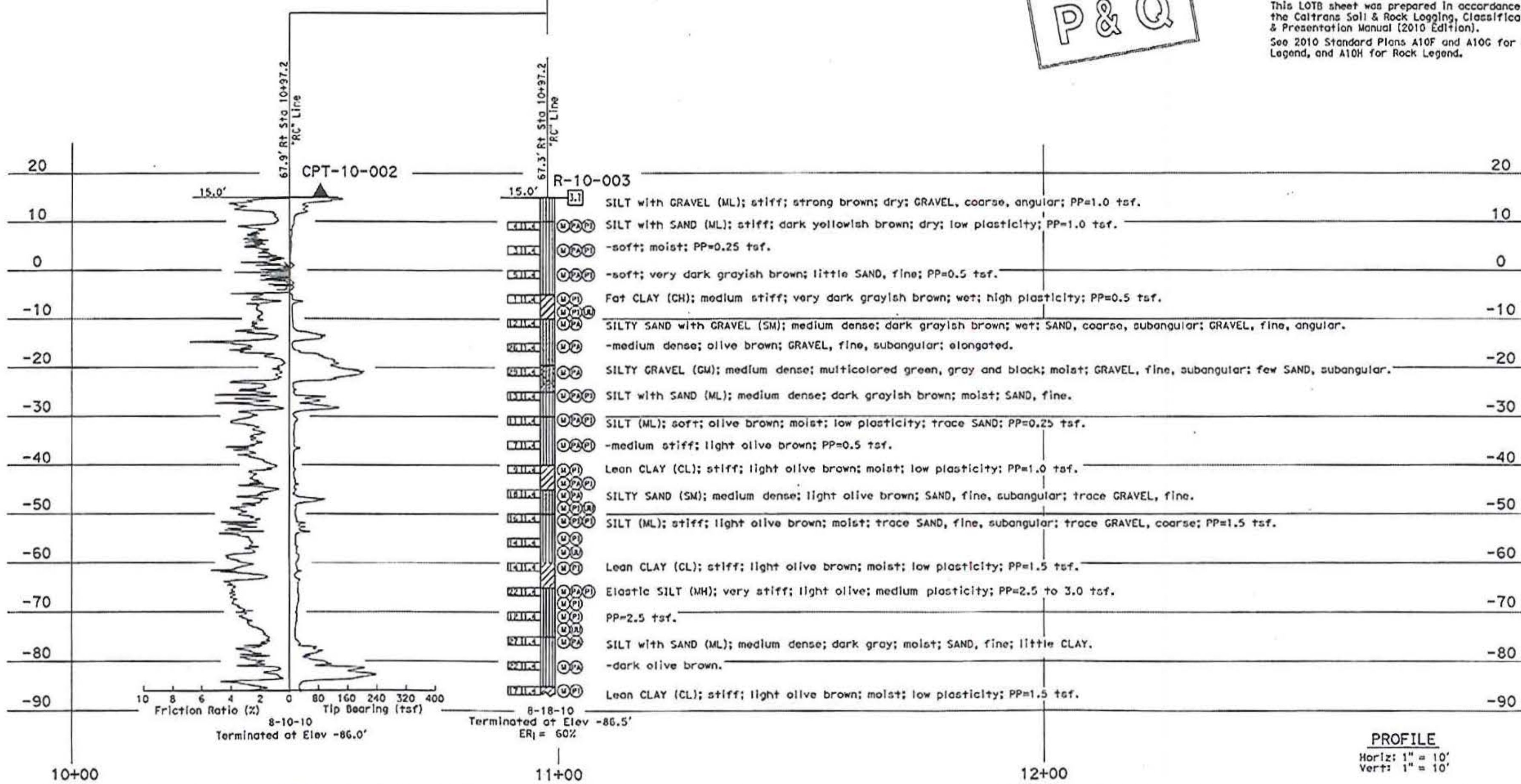
FOR PLAN VIEW, SEE "LOG OF TEST BORINGS 1 OF 2"

P & Q



PROFILE

Horiz: 1" = 10'
Vert: 1" = 10'

ENGINEERING SERVICES		MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 16	BRIDGE NO. RETW	RETAINING WALL A, B & C
FUNCTIONAL SUPERVISOR	DRAWN BY: I.G-Rommen	FIELD INVESTIGATION BY:			POST MILE 0.01	LOG OF TEST BORINGS 2 OF 2
NAME: M. Womenzadeh	CHECKED BY: D. Nesbitt	R. Nashed				

GEO CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

UNIT: 3643

PROJECT NUMBER & PHASE: 04000006781

CONTRACT NO.: 04-235621

DISREGARD PRINTS BEARING EARLIER REVISION DATES

SHEET 8 OF 8

FILE => 35-ret wall-a-11002.dgn

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SM	101			

10-5-12
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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PROFESSIONAL GEOLOGIST
Christopher Risden
No. 2241
Exp. 9-30-13
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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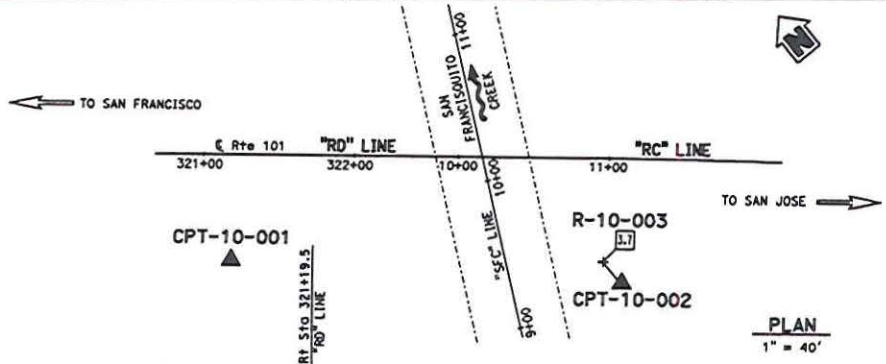
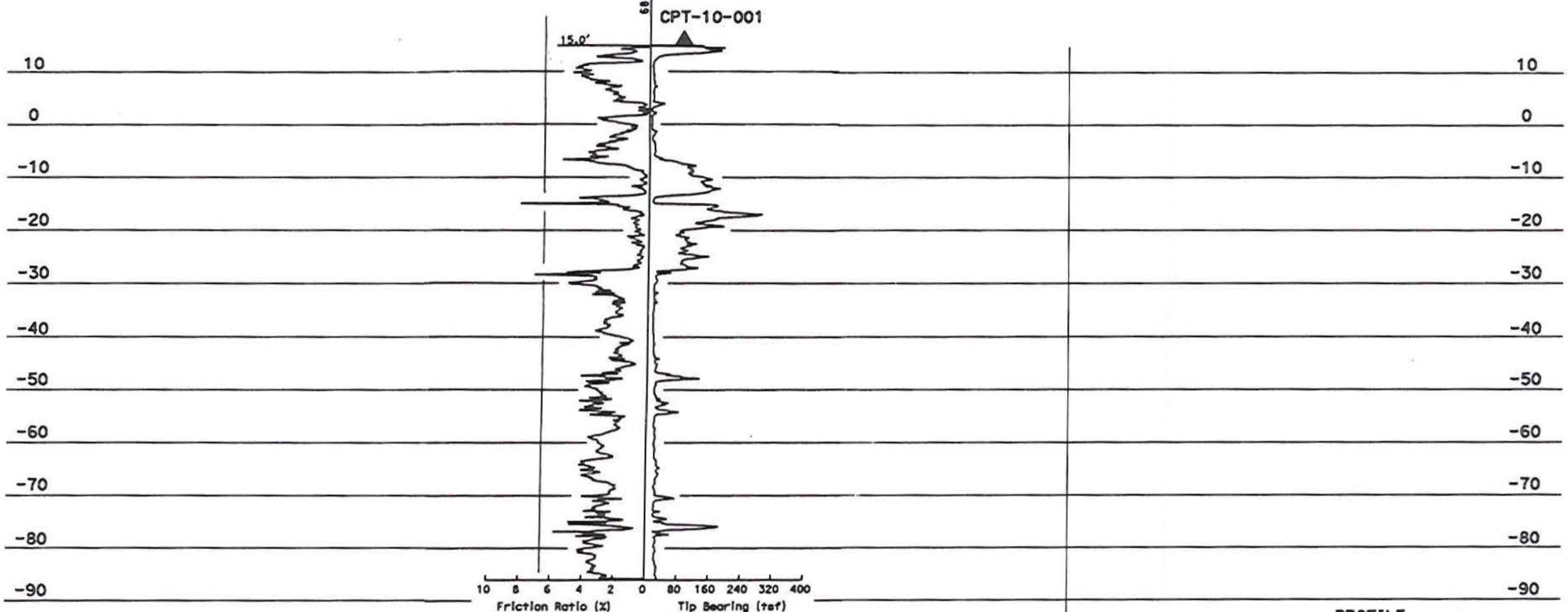
BENCH MARK

PRHV-55X Elev 16.90'
Fnd 1" Iron Pipe w/Caltrans Plug
83.29' Rt "RD" Line Rte 101 Sta 322+13.33
N 1,991,416.44
E 6,089,072.23
Vertical Datum NGVD29



PLAN
1" = 40'

Note: Ground water encountered but not measured in Borings R-10-003, CPT-10-001, and CPT-10-002.



PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

ENGINEERING SERVICES		MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SOUND WALLS
FUNCTIONAL SUPERVISOR NAME: M. Momenzadeh	DRAWN BY: I.G-Remmen CHECKED BY: D. Nesbitt	FIELD INVESTIGATION BY: T. Nguyen		DESIGN BRANCH X	POST MILE 0.0	LOG OF TEST BORINGS 1 OF 2

DES CIVIL LOG OF TEST BORINGS SHEET | ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3 | UNIT: 3643 PROJECT NUMBER & PHASE: 04000006781 | CONTRACT NO.: 04-235621 | DISREGARD PRINTS BEARING EARLIER REVISION DATES | REVISION DATES 10-5-12 | SHEET X OF X

FILE => soundwall1.dgn

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	101			

10-5-12
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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Christopher Risden, No. 2541, Exp. 3-30-13, CERTIFIED ENGINEERING GEOLOGIST, STATE OF CALIFORNIA

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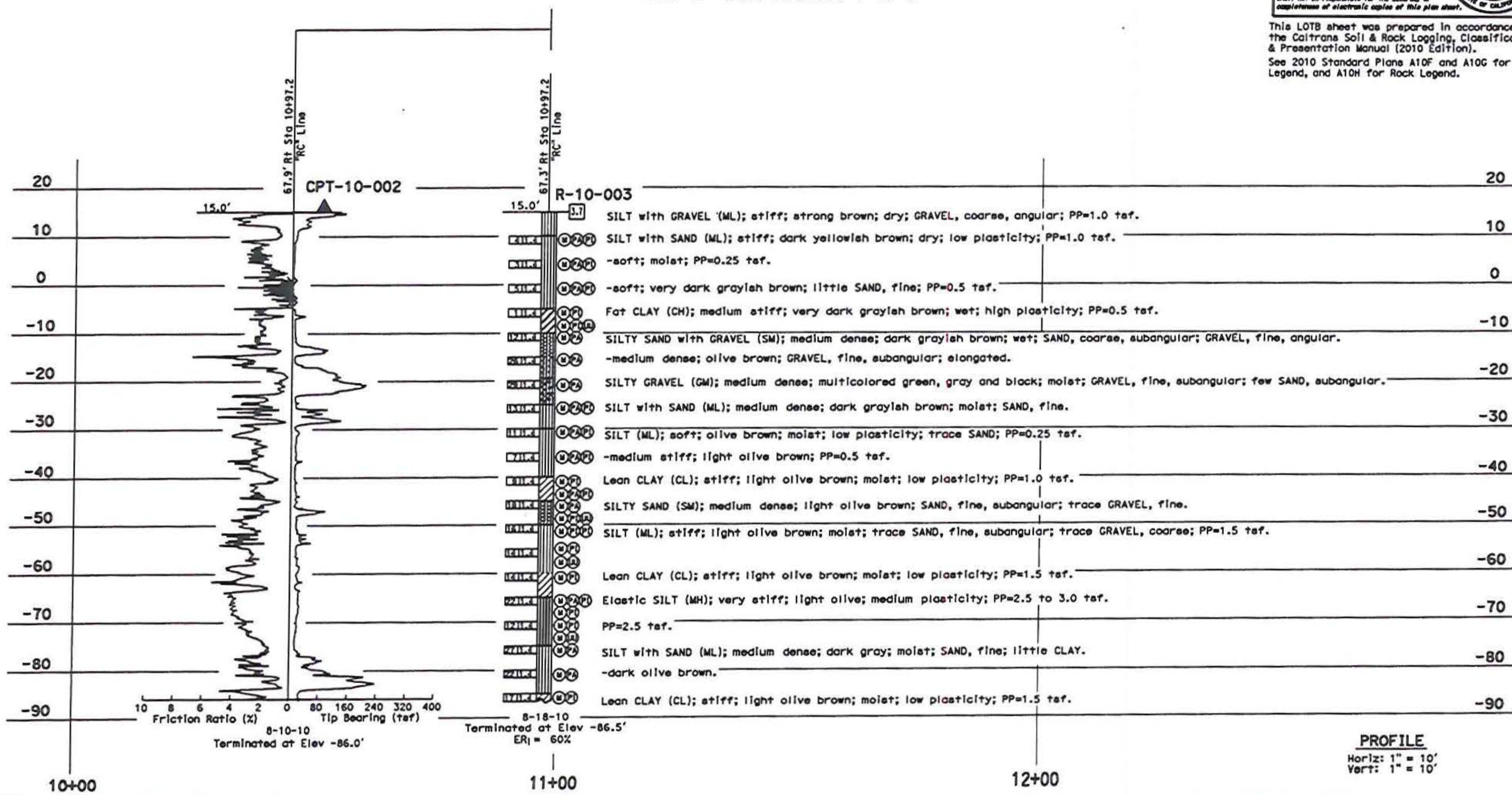
FOR PLAN VIEW, SEE "LOG OF TEST BORINGS 1 OF 2"



PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

ENGINEERING SERVICES		MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN — DESIGN BRANCH X	BRIDGE NO. / POST MILE 0.0	SOUND WALLS — LOG OF TEST BORINGS 2 OF 2
FUNCTIONAL SUPERVISOR NAME: M. Momenzadeh	DRAWN BY: I.G-Ramnen; CHECKED BY: D. Nesbitt	FIELD INVESTIGATION BY: R. Nashed		UNIT: 3643; PROJECT NUMBER & PHASE: 04000006781	CONTRACT NO.: 04-235621	DISREGARD PRINTS BEARING EARLIER REVISION DATES; SHEET X OF X

GS CIVIL LOG OF TEST BORING SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

FILE => soundwalls2.dgn

APPENDIX C

LABORATORY TEST DATA

MOISTURE CONTENT DETERMINATION
(CTM 226)

County : San Mateo | Route : 101 | P.M. : 52.6/0.0 | E.A.: 04-235621 | Job No. : 6787

Limits :

R.E. : R. Nashed // TUNG NGUYEN

Date Received : 09/14/10 | Date Calculated : 09/21/10

Date Reported : SEP 30 2010 | By : AU

PAGE : 1 of 2

HOLE	SAMPLE	DEPTH	TEST	GROSS WEIGHT		TARE	NET WEIGHT		MOISTURE	%
			(MC/PI/MA/GRAD)	Wet	Dry	Weight	Wet	Dry	Weight	Moisture
R-10-001-S1		5'-6.5'	MC/MA/PI	1478.8	1314.0	672.0	806.8	642.0	164.8	25.7%
R-10-001-S2		10'-11.5'	MC/MA/PI	1057.1	839.2	98.0	959.1	741.2	217.9	29.4%
R-10-001-S3		15'-16.5'	MC/MA	809.1	660.6	99.7	709.4	560.9	148.5	26.5%
R-10-001-S4		20'-21.5'	MC/MA/PI	1097.6	825.3	101.6	996.0	723.7	272.3	37.6%
R-10-001-S5		25'-26.5'	MC/MA/PI	849.4	651.9	100.1	749.3	551.8	197.5	35.8%
R-10-001-S6		30'-31.5'	MC/PI	707.9	576.6	99.8	608.1	476.8	131.3	27.5%
R-10-001-S7		35'-36.5'	MC/MA	737.1	627.1	98.9	638.2	528.2	110.0	20.8%
R-10-001-S9		45'-46.5'	MC/MA/PI	1138.7	899.8	99.9	1038.8	799.9	238.9	29.9%
R-10-001-S10		50'-51.5'	MC/PI	935.6	728.6	102.0	833.6	626.6	207.0	33.0%
R-10-001-S11		55'-56.5'	MC/MA	1402.8	1185.9	100.0	1302.8	1085.9	216.9	20.0%
R-10-001-S12		60'-61.5'	MC/MA/PI	1111.9	953.9	100.9	1011.0	853.0	158.0	18.5%
R-10-001-S13		65'-66.5'	MCMA/PI	1240.2	976.3	98.4	1141.8	877.9	263.9	30.1%
R-10-001-S14		70'-71.5'	MC/MA/PI	1308.4	1005.4	99.4	1209.0	906.0	303.0	33.4%
R-10-001-S15		75'-76.5'	MC/MA/PI	916.3	758.9	100.9	815.4	658.0	157.4	23.9%
R-10-001-S16		85'-86.5'	MC/MA/PI	318.2	268.8	100.3	217.9	168.5	49.4	29.3%
R-10-001-S17		90'-91.5'	MC/MA/PI	1484.4	1187.2	101.4	1383.0	1085.8	297.2	27.4%
R-10-001-S18		95'-96.5'	MC/MA	663.7	558.3	99.2	564.5	459.1	105.4	23.0%

MC - Moisture Content PI - Plasticity Index MA - Mechanical Analysis

MC Test Only - 230°F Oven; w/ PI and/or MA Tests - 140°F Oven; w/ AC Material - 100°F Oven

MOISTURE CONTENT DETERMINATION
(CTM 226)

County :	San Mateo	Route :	101	P.M. :	52.6/0.0	E.A.:	04-235621	Job No. :	6787
Limits :						R.E. :	R. Nashed / TUNG NGUYEN		
Date Received :	09/14/10	Date Calculated :	09/21/10						
Date Reported :	SEP 30 2010	By :	AU			PAGE :	2 of 2		

HOLE	SAMPLE	DEPTH	TEST (MC/PI/MA/GRAD)	GROSS WEIGHT Wet	GROSS WEIGHT Dry	TARE Weight	NET WEIGHT Wet	NET WEIGHT Dry	MOISTURE Weight	% Moisture
R-10-001-S19		100'-101.5'	MC/MA/PI	1009.2	806.8	99.8	909.4	707.0	202.4	28.6%
R-10-001-S20		105'-106.5'	MC/MA/PI	1078.0	886.2	99.8	978.2	786.4	191.8	24.4%

MC - Moisture Content PI - Plasticity Index MA - Mechanical Analysis
MC Test Only - 230°F Oven; w/ PI and/or MA Tests - 140°F Oven; w/ AC Material - 100°F Oven

MOISTURE CONTENT DETERMINATION
(CTM 226)

County : San Mateo Route : 101 P.M. : 52.6/0.0 E.A.: 04-235621 Job No. : 6787

Limits : R.E. : R. Nashed/Tung Nguyen

Date Received : 09/14/10 Date Calculated : 09/27/10

Date Reported : SEP 30 2010 By : AU PAGE : 1 of 2

HOLE	SAMPLE	DEPTH	TEST (MC/PI/MA/GRAD)	GROSS WEIGHT Wet	GROSS WEIGHT Dry	TARE Weight	NET WEIGHT Wet	NET WEIGHT Dry	MOISTURE Weight	% Moisture
R-10-002-S1		5'-6.5'	MC/MA/PI	468.7	416.1	99.4	369.3	316.7	52.6	16.6%
R-10-002-S2		10'-11.5'	MC/MA	826.8	702.5	101.9	724.9	600.6	124.3	20.7%
R-10-002-S3		15'-16.5'	MC/MA	712.9	593.0	101.7	611.2	491.3	119.9	24.4%
R-10-002-S4		20'-21.5'	MC/MA/PI	990.3	629.3	99.9	890.4	529.4	361.0	68.2%
R-10-002-S5		25'-26.5'	MC/MA	600.0	495.0	99.8	500.2	395.2	105.0	26.6%
R-10-002-S6		30'-31.5'	MC/MA	479.6	432.9	101.0	378.6	331.9	46.7	14.1%
R-10-002-S7		35'-36.5'	MC/MA	635.1	556.6	101.4	533.7	455.2	78.5	17.2%
R--10-002-S8		40'-41.5'	MC/MA	889.4	764.1	98.6	790.8	665.5	125.3	18.8%
R-10-002-S9		45'-46.5'	MC/MA/PI	938.1	723.2	100.2	837.9	623.0	214.9	34.5%
R-10-002-S10		50'-51.5'	MC/PI	828.6	670.4	101.1	727.5	569.3	158.2	27.8%
R-10-002-S11		55'-56.5'	MC/MA	1597.8	1330.3	102.0	1495.8	1228.3	267.5	21.8%
R-10-002-S12		60'-61.5'	MC/MA	822.1	701.4	99.7	722.4	601.7	120.7	20.1%
R-10-002-S13		65'-66.5'	MC/MA/PI	425.0	361.8	101.5	323.5	260.3	63.2	24.3%
R-10-002-S14		70'-71.5'	MC/PI	1394.9	1228.2	679.9	715.0	548.3	166.7	30.4%
R-10-002-S15		75'-76.5'	MC/MA/PI	1226.1	1115.1	681.7	544.4	433.4	111.0	25.6%
R-10-002-S17		85'-86.5'	MC/PI	939.9	880.2	686.7	253.2	193.5	59.7	30.9%
R-10-002-S18		90'-91.5'	MC/MA/PI	1608.7	1409.4	669.2	939.5	740.2	199.3	26.9%
R10-002-S19		95'-96.5'	MC/MA/PI	1721.2	1509.2	672.8	1048.4	836.4	212.0	25.3%

MC - Moisture Content PI - Plasticity Index MA - Mechanical Analysis

MC Test Only - 230°F Oven; w/ PI and/or MA Tests - 140°F Oven; w/ AC Material - 100°F Oven

MOISTURE CONTENT DETERMINATION
(CTM 226)

County : San Mateo **Route :** 101 **P.M. :** 52.6/0.0 **E.A.:** 04-235621 **Job No. :** 6787

Limits : **R.E. :** R. Nashed/Tung Nguyen

Date Received : 09/14/10 **Date Calculated :** 09/27/10

Date Reported : SEP 30 2010 **By :** AU **PAGE :** 2 of 2

HOLE	SAMPLE	DEPTH	TEST (MC/PI/MA/GRAD)	GROSS WEIGHT Wet	GROSS WEIGHT Dry	TARE Weight	NET WEIGHT Wet	NET WEIGHT Dry	MOISTURE Weight	% Moisture
R-10-002-S20		100'-101.5'	MC/MA	1806.0	1553.1	673.6	1132.4	879.5	252.9	28.8%

MC - Moisture Content PI - Plasticity Index MA - Mechanical Analysis
MC Test Only - 230°F Oven; w/ PI and/or MA Tests - 140°F Oven; w/ AC Material - 100°F Oven

LVALDEZ, DL4, REV. 06-2003

MOISTURE CONTENT DETERMINATION
(CTM 226)

County : San Mateo Route : 101 P.M. : 52.6/0.0 E.A.: 04-235621 Job No. : 6787

Limits : R.E. : R. Nashed/Tung Nguyen

Date Received : 09/14/10 Date Calculated : 09/27/10

Date Reported : SEP 30 2010 By : AU PAGE : 1 of 2

HOLE	SAMPLE	DEPTH	TEST (MC/PI/MA/GRAD)	GROSS WEIGHT Wet	GROSS WEIGHT Dry	TARE Weight	NET WEIGHT Wet	NET WEIGHT Dry	MOISTURE Weight	% Moisture
R-10-003-S1		5'-6.5'	MC/MA/PI	416.7	372.7	100.2	316.5	272.5	44.0	16.1%
R-10-003-S2		10'-11.5'	MC/MA/PI	472.4	400.0	101.1	371.3	298.9	72.4	24.2%
R-10-003-S3		15'-16.5'	MC/MA/PI	1281.3	1001.1	101.9	1179.4	899.2	280.2	31.2%
R-10-003-S4		20'-21.5'	MC/PI	1071.2	674.2	100.5	970.7	573.7	397.0	69.2%
R-10-003-S5		25'-26.5'	MC/MA	662.1	559.8	101.4	560.7	458.4	102.3	22.3%
R-10-003-S6		30'-31.5'	MC/MA	1373.6	1111.1	101.4	1272.2	1009.7	262.5	26.0%
R-10-003-S7		35'-36.5'	MC/MA	541.1	461.4	101.6	439.5	359.8	79.7	22.2%
R-10-003-S8		40'-41.5'	MC/MA/PI	1405.4	1260.4	673.2	732.2	587.2	145.0	24.7%
R-10-003-S9		45'-46.5'	MC/MA/PI	1014.7	928.3	669.9	344.8	258.4	86.4	33.4%
R-10-003-S10		50'-51.5'	MC/MA/PI	1019.5	922.6	680.9	338.6	241.7	96.9	40.1%
R-10-003-S11		55'-56.5'	MC/PI	844.1	663.3	157.4	686.7	505.9	180.8	35.7%
R-10-003-S12		60'-61.5'	MC/MA	964.1	819.6	157.6	806.5	662.0	144.5	21.8%
R-10-003-S13		65'-66.5'	MC/MA/PI	1083.9	854.3	157.3	926.6	697.0	229.6	32.9%
R-10-003-S15		75'-76.5'	MC/PI	769.2	623.7	159.0	610.2	464.7	145.5	31.3%
S-10-003-S16		80'-81.5'	MC/MA/PI	945.1	746.8	159.0	786.1	587.8	198.3	33.7%
R-10-003-S17		85'-86.5	MC/PI	841.0	648.5	157.8	683.2	490.7	192.5	39.2%
R-10-003-S18		90'-91.5'	MC/MA	941.3	780.3	156.5	784.8	623.8	161.0	25.8%

MC - Moisture Content PI - Plasticity Index MA - Mechanical Analysis

MC Test Only - 230°F Oven; w/ PI and/or MA Tests - 140°F Oven; w/ AC Material - 100°F Oven

MOISTURE CONTENT DETERMINATION
(CTM 226)

County : San Mateo Route : 101 P.M. : 52.6/0.0 E.A.: 04-235621 Job No. : 6787

Limits : R.E. : R. Nashed/Tung Nguyen

Date Received : 09/14/10 Date Calculated : 09/27/10

Date Reported : SEP 30 2010 By : AU PAGE : 2 of 2

HOLE	SAMPLE	DEPTH	TEST (MC/PI/MA/GRAD)	GROSS WEIGHT Wet	GROSS WEIGHT Dry	TARE Weight	NET WEIGHT Wet	NET WEIGHT Dry	MOISTURE Weight	% Moisture
S-10-003-S19		95'-96.5'	MC/MA	550.6	470.7	156.3	394.3	314.4	79.9	25.4%
S-10-003-S20		100'-101.5'	MC/PI	973.1	787.6	153.2	819.9	634.4	185.5	29.2%

MC - Moisture Content PI - Plasticity Index MA - Mechanical Analysis
MC Test Only - 230°F Oven; w/ PI and/or MA Tests - 140°F Oven; w/ AC Material - 100°F Oven

CALIFORNIA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL LABORATORY

GL TRACKING NO : 10-062
Dist - EA: 04-235620
Report Date: September 23, 2010

CLASSIFICATION TEST SUMMARY

SAMPLE ID	% FINER THAN																	ATTERBERG LIMITS		AS RECEIVED		Gs
	3"	2 1/2"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	5µ	1µ	LL	PI	γd (pcf)	%m	
R-10-001_P1																		45	19		40.7	
R-10-001_P2																					48.1	2.62
R-10-001_P3																					27.9	2.75
R-10-001_P4																					23.9	2.71
R-10-001_P5																		51	28		32.0	
R-10-002_09A																					34.4	
R-10-002_09B																					32.8	2.76
R-10-002_10B																					32.2	2.73
R-10-002_10C																					38.3	
R-10-003_04B																		57	29		53.3	
R-10-003_09B																		40	22	96.5	27.6	
R-10-003_09C																					27.8	2.73
R-10-003_09D																						
R-10-003_10A																		48	27		32.3	
R-10-003_10B																					29.1	2.72
R-10-003_11B								100	97	93	90	85	74	57	46	23	15	26	10		19.7	
R-10-003_11C																					23.0	2.73
R-10-003_12A																		43	21		26.5	
R-10-003_12B																					31.0	2.75
R-10-003_13A													100	99	96	60	32			91.4	31.9	
R-10-003_13B																		42	21		28.8	
R-10-003_13C																					27.7	2.79
R-10-003_14D																					24.4	
R-10-003_15A																					30.0	2.62
R-10-003_15B																		60	33	95.6	29.9	
R-10-003_16D																		79	48	78.1	43.1	
R-10-003_17B																		30	11	97.0	27.6	
R-10-003_17C																					32.9	2.84

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-001
Sample No.: P2
Test No.: 10-053-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/7/10
Sample Type: Tube

Project No.: 04-235620
Checked By: GL# 10-062
Depth: 24-24.5
Elevation:

Soil Description: Moist, dark-brown, stiff, silt
Remarks:

Measured Specific Gravity: 2.62
Initial Void Ratio: 2.77
Final Void Ratio: 2.09

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 1.00 in
Specimen Diameter: 2.38 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	190.3	190.3	179.4	179.4
Wt. Container + Dry Soil, gm	140.4	140.4	140.4	140.4
Wt. Container, gm	90	90	90	90
Wt. Dry Soil, gm	50.4	50.4	50.4	50.4
Water Content, %	99.01	99.01	77.38	77.38
Void Ratio	---	2.77	2.09	---
Degree of Saturation, %	---	93.55	97.02	---
Dry Unit Weight, pcf	---	43.34	52.918	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-001
Sample No.: P2
Test No.: 10-053-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/7/10
Sample Type: Tube

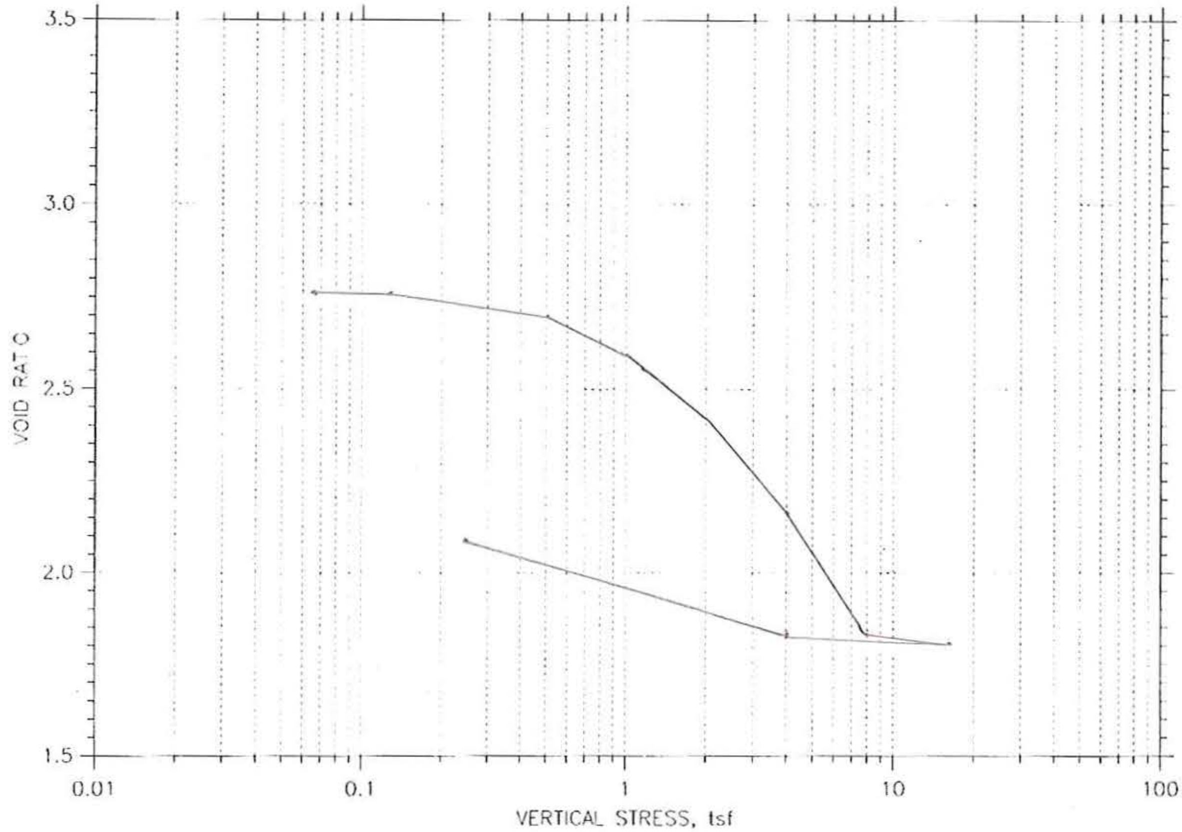
Project No.: 04-235620
Checked By: GL# 10-062
Depth: 24-24.5
Elevation:

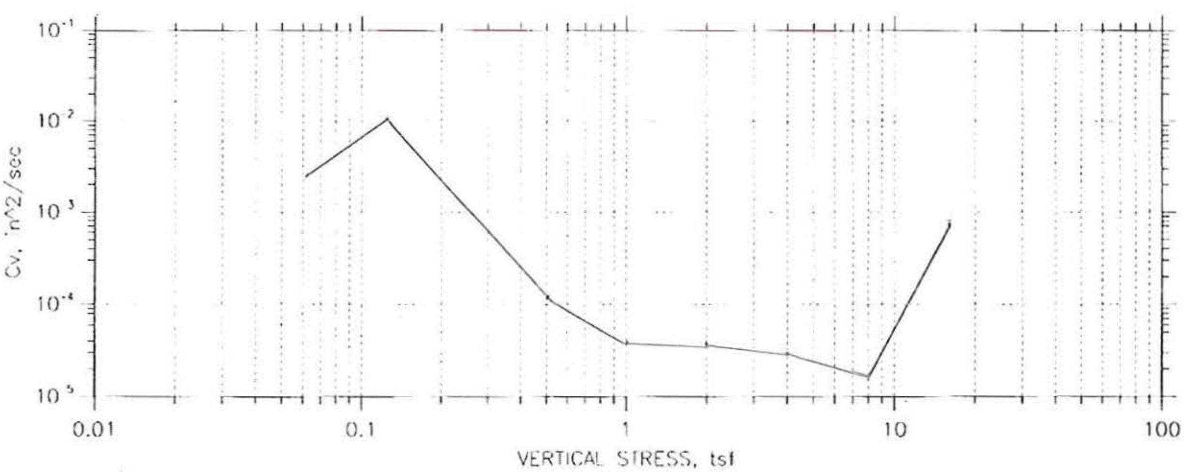
Soil Description: Moist, dark-brown, stiff, silt
Remarks:

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.0625	0.001904	2.762	0.19	0.4	0.2	1.87e-003	3.65e-003	2.48e-003
2	0.125	0.002663	2.760	0.27	0.1	0.0	1.01e-002	0.00e+000	1.01e-002
3	0.5	0.0185	2.700	1.85	7.0	0.0	1.15e-004	0.00e+000	1.15e-004
4	1	0.04652	2.594	4.65	20.8	0.0	3.70e-005	0.00e+000	3.70e-005
5	2	0.09239	2.421	9.24	18.9	0.0	3.76e-005	0.00e+000	3.76e-005
6	4	0.1601	2.166	16.01	21.4	0.0	2.94e-005	0.00e+000	2.94e-005
7	8	0.2494	1.829	24.94	29.7	0.0	1.75e-005	0.00e+000	1.75e-005
8	16	0.256	1.805	25.60	0.6	0.7	7.44e-004	7.02e-004	7.22e-004
9	4	0.25	1.827	25.00	1.3	0.0	3.45e-004	0.00e+000	3.45e-004
10	0.25	0.181	2.087	18.10	30.8	0.0	1.64e-005	0.00e+000	1.64e-005

CONSOLIDATION TEST DATA

SUMMARY REPORT





	Project: San Francisquito Bg	Location: 04 SCl -101 52.6	Project No.: 04-235620
	Boring No.: R10-001	Tested By: AZM	Checked By: GI # 10-062
	Sample No.: P2	Test Date: 9/7/10	Depth: 24-24.5
	Test No.: 10-053-C1	Sample Type: Tube	Elevation:
	Description: Moist, dark brown, stiff, silt		
	Remarks:		

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CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-001
Sample No.: P3
Test No.: 10-054-G3

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/7/2010
Sample Type: Tube

Project No.: 04-235620
Checked By: GL#10-062
Depth: 29.5-30
Elevation:

Soil Description: Moist, olive, stiff, silt
Remarks: Bridge # 35-0348

Measured Specific Gravity: 2.75
Initial Void Ratio: 0.84
Final Void Ratio: 0.66

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 1.00 in
Specimen Diameter: 2.38 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	231.7	231.7	224.9	224.9
Wt. Container + Dry Soil, gm	198.8	198.8	198.8	198.8
Wt. Container, gm	90.4	90.4	90.4	90.4
Wt. Dry Soil, gm	108.4	108.4	108.4	108.4
Water Content, %	30.35	30.35	24.08	24.08
Void Ratio	---	0.84	0.66	---
Degree of Saturation, %	---	99.29	99.79	---
Dry Unit Weight, pcf	---	93.216	103.13	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-001
Sample No.: P3
Test No.: 10-054-G3

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/7/2010
Sample Type: Tube

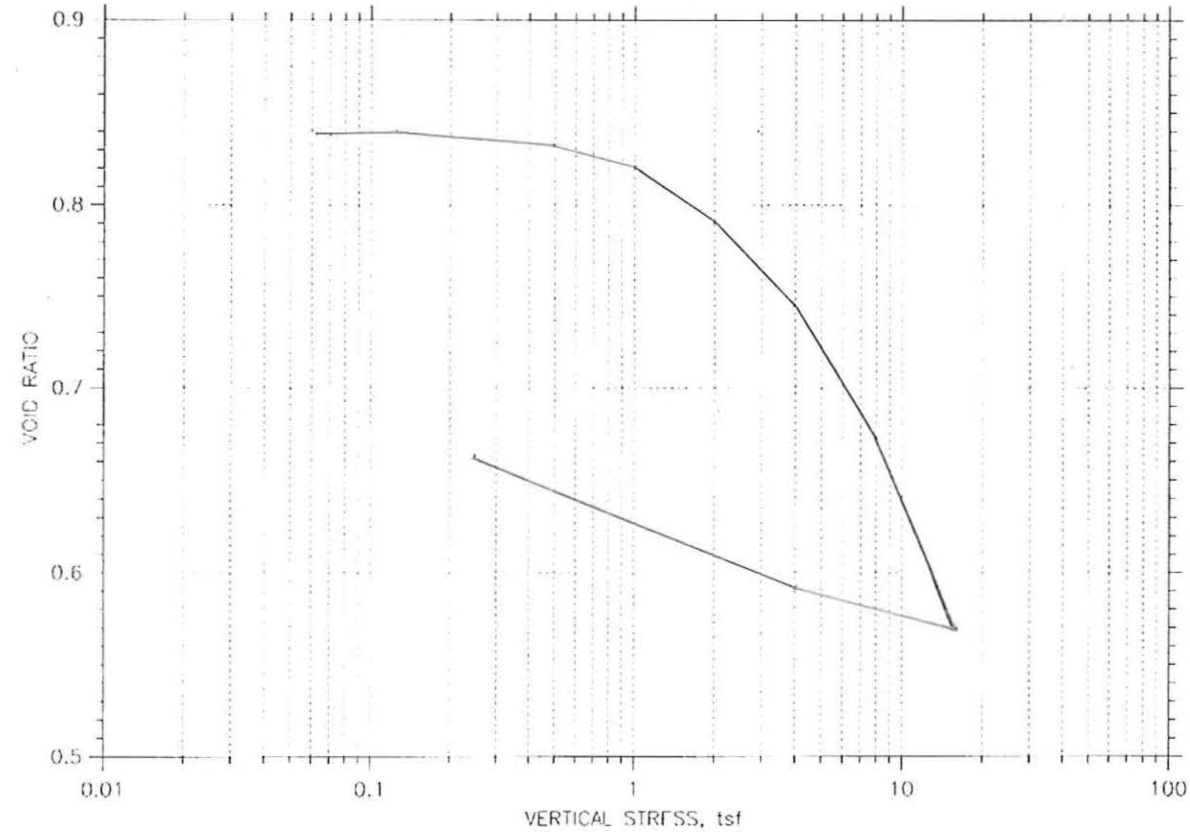
Project No.: 04-235620
Checked By: GL#10-062
Depth: 29.5-30
Elevation:

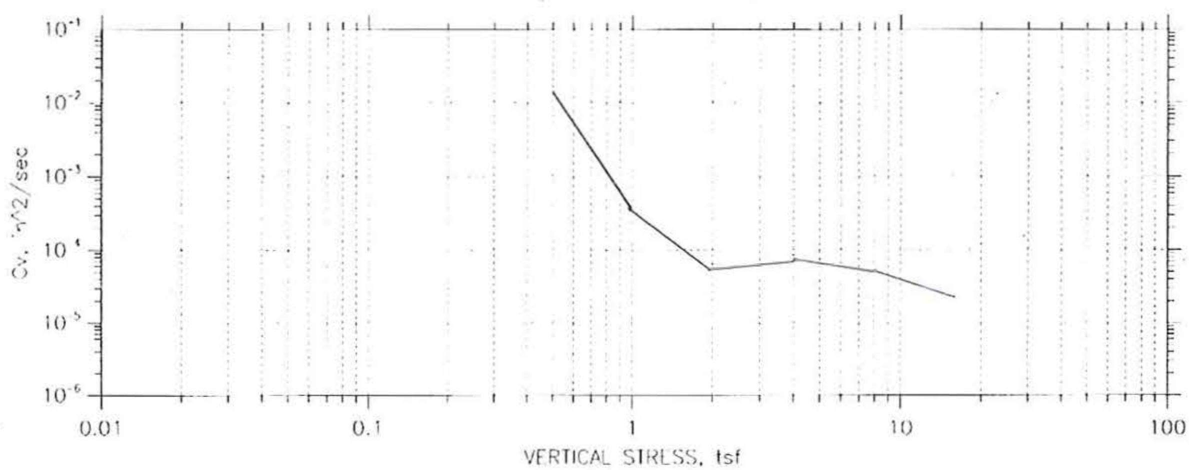
Soil Description: Moist, olive, stiff, silt
Remarks: Bridge # 35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.0625	0.0004394	0.839	0.04	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
2	0.125	-0.0001072	0.840	-0.01	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
3	0.5	0.003658	0.833	0.37	0.1	0.0	1.33e-002	0.00e+000	1.33e-002
4	1	0.009643	0.822	0.96	2.7	1.9	3.00e-004	4.34e-004	3.55e-004
5	2	0.02599	0.792	2.60	14.5	0.0	5.47e-005	0.00e+000	5.47e-005
6	4	0.05121	0.745	5.12	10.3	0.0	7.34e-005	0.00e+000	7.34e-005
7	8	0.09033	0.674	9.03	15.0	12.7	4.72e-005	5.58e-005	5.11e-005
8	16	0.1469	0.570	14.69	27.7	0.0	2.31e-005	0.00e+000	2.31e-005
9	4	0.1347	0.592	13.47	7.7	2.4	7.93e-005	2.49e-004	1.20e-004
10	0.25	0.09615	0.663	9.61	65.6	0.0	9.81e-006	0.00e+000	9.81e-006

CONSOLIDATION TEST DATA

SUMMARY REPORT





Project: San Francisquito Bg	Location: 04-SCL-101-52.6	Project No.: 04-235620
Boring No.: R10-001	Tested By: AZM	Checked By: GL#10-062
Sample No.: P3	Test Date: 9/7/2010	Depth: 29.5-30
Test No.: 10-054-G3	Sample Type: Tube	Elevation:
Description: Moist, olive, stiff, silt		
Remarks: Bridge # 35-0348		

Tue, 21-SEP-2010 12:02:59

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-001
Sample No.: P4
Test No.: 10-055-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/13/10
Sample Type: Tube

Project No.: 04-235620
Checked By: GL# 10-062
Depth: 49.5-50
Elevation:
WP 9/21

Soil Description: Moist, brown, stiff, silt w/gravel
Remarks:

Measured Specific Gravity: 2.71
Initial Void Ratio: 0.65
Final Void Ratio: 0.53

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 1.00 in
Specimen Diameter: 2.38 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	239.2	239.2	233.8	233.8
Wt. Container + Dry Soil, gm	210.7	210.7	210.7	210.7
Wt. Container, gm	91.1	91.1	91.1	91.1
Wt. Dry Soil, gm	119.6	119.6	119.6	119.6
Water Content, %	23.83	23.83	19.31	19.31
Void Ratio	---	0.65	0.53	---
Degree of Saturation, %	---	99.90	99.70	---
Dry Unit Weight, pcf	---	102.85	111.04	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-001
Sample No.: P4
Test No.: 10-055-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/13/10
Sample Type: Tube

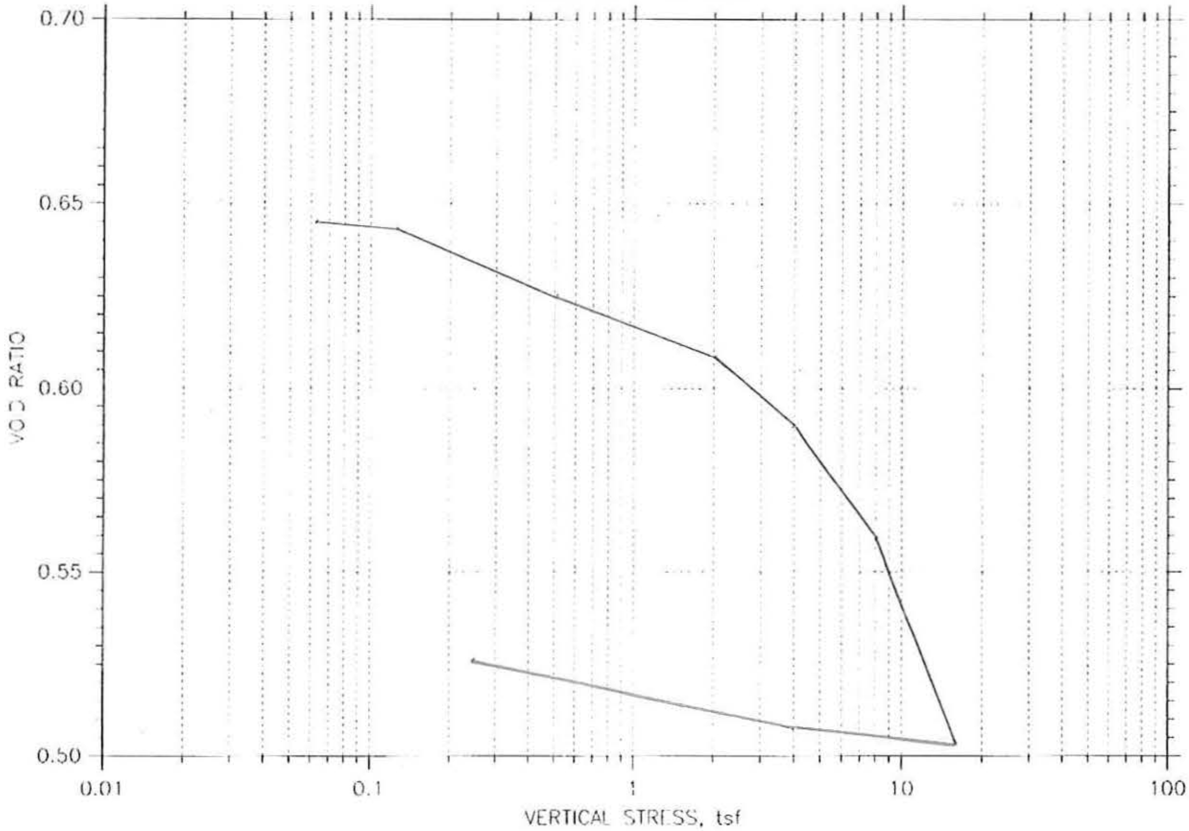
Project No.: 04-235620
Checked By: GL# 10-062
Depth: 49.5-50
Elevation:

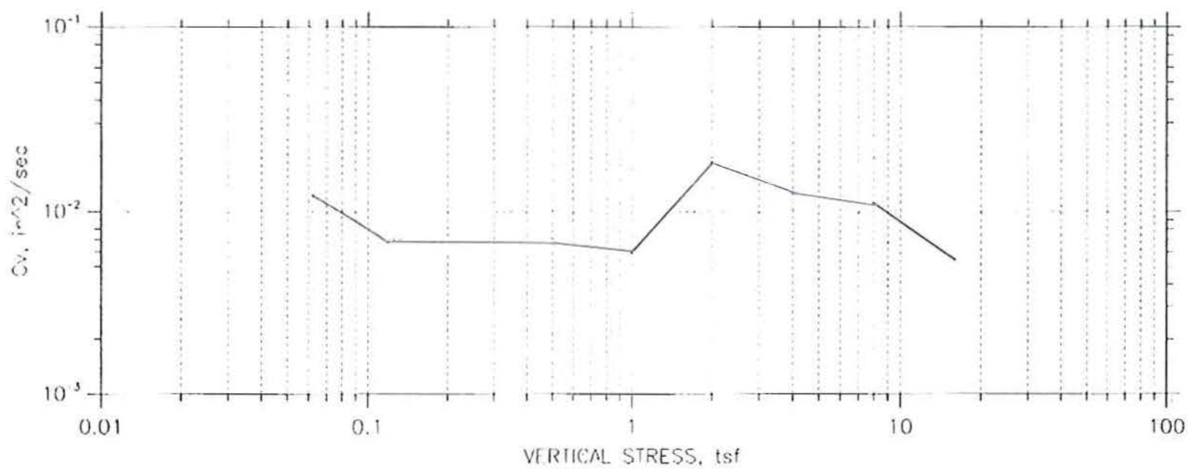
Soil Description: Moist, brown, stiff, silt w/gravel
Remarks:

	Applied Stress	Final Displacement	Void Ratio	Strain at End	T50 Fitting		Coefficient of Consolidation		
					Sq.Rt.	Log	Sq.Rt.	Log	Ave.
	tsf	in		%	min	min	in^2/sec	in^2/sec	in^2/sec
1	0.0625	0.001452	0.645	0.15	0.1	0.0	1.22e-002	0.00e+000	1.22e-002
2	0.125	0.002613	0.643	0.26	0.1	0.0	6.73e-003	0.00e+000	6.73e-003
3	0.5	0.01378	0.625	1.38	0.1	0.1	6.91e-003	6.50e-003	6.70e-003
4	1	0.01815	0.617	1.82	0.1	0.1	6.35e-003	5.62e-003	5.96e-003
5	2	0.02338	0.609	2.34	0.1	0.0	1.53e-002	2.36e-002	1.86e-002
6	4	0.0348	0.590	3.48	0.1	0.1	1.32e-002	1.18e-002	1.25e-002
7	8	0.05311	0.560	5.31	0.1	0.1	1.02e-002	1.21e-002	1.11e-002
8	16	0.08741	0.503	8.74	0.2	0.1	4.31e-003	7.61e-003	5.50e-003
9	4	0.08484	0.508	8.48	0.0	0.0	6.35e-002	0.00e+000	6.35e-002
10	0.25	0.07382	0.526	7.38	0.1	0.0	4.72e-003	1.97e-002	7.62e-003

CONSOLIDATION TEST DATA

SUMMARY REPORT





Project: San Francisquito Bg	Location: 04-SCL-101-52.6	Project No.: 04-235620
Boring No.: R10 001	Tested By: AZM	Checked By: GL# 10-062
Sample No.: P4	Test Date: 9/13/10	Depth: 49.5-50
Test No.: 10-055-G1	Sample Type: Tube	Elevation:
Description: Moist, brown, stiff, silt w/gravel		
Remarks:		

Tue, 21-SEP-2010 12:19:58

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-002
Sample No.: 09B
Test No.: 10-056-G3

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/14/2010
Sample Type: Tube

Project No.: 04-235620
Checked By: GL#10-062
Depth: 48.5-49 JP 9/21
Elevation:

Soil Description: Moist, brown, stiff, silt
Remarks: Bridge #35-0348

Measured Specific Gravity: 2.76
Initial Void Ratio: 1.03
Final Void Ratio: 0.71

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	90.3	90.3	84.8	84.8
Wt. Container + Dry Soil, gm	72.1	72.1	72.1	72.1
Wt. Container, gm	22.5	22.5	22.5	22.5
Wt. Dry Soil, gm	49.6	49.6	49.6	49.6
Water Content, %	36.69	36.69	25.60	25.60
Void Ratio	---	1.03	0.71	---
Degree of Saturation, %	---	98.34	99.76	---
Dry Unit Weight, pcf	---	84.882	100.85	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-002
Sample No.: 09B
Test No.: 10-056-G3

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/14/2010
Sample Type: Tube

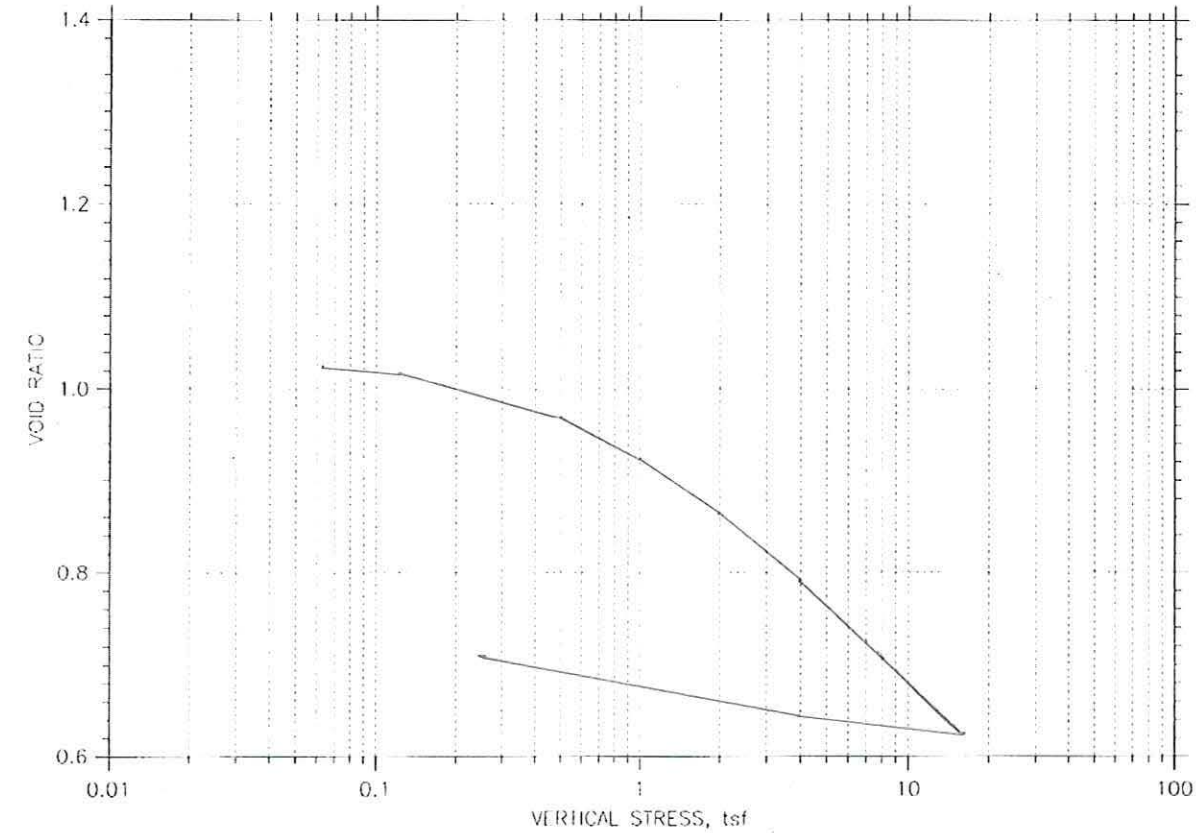
Project No.: 04-235620
Checked By: GL#10-062
Depth: 48.5-49
Elevation:

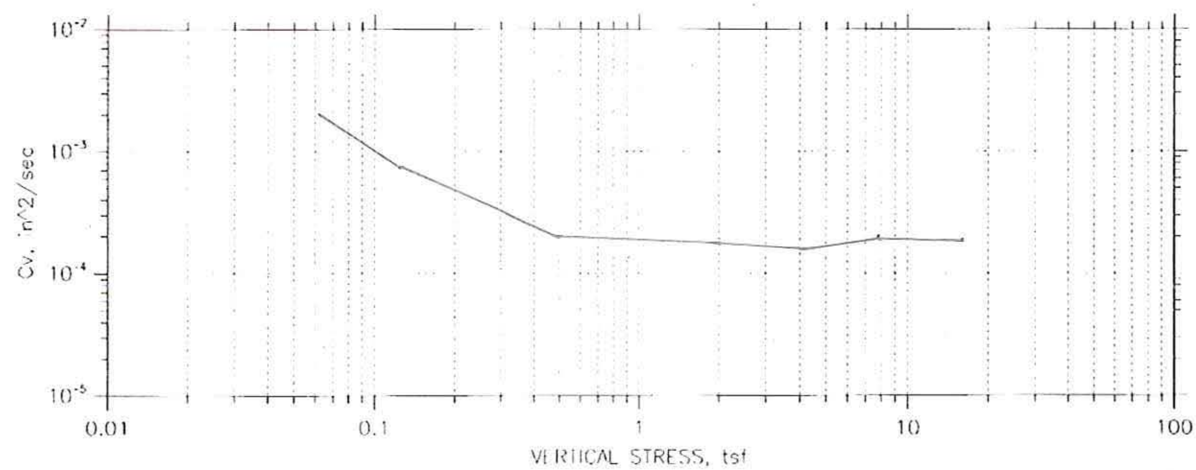
Soil Description: Moist, brown, stiff, silt
Remarks: Bridge #35-0348

	Applied Stress	Final Displacement	Void Ratio	Strain at End	T50 Fitting		Coefficient of Consolidation		
					Sq.Rt.	Log	Sq.Rt.	Log	Ave.
	tsf	in		%	min	min	in^2/sec	in^2/sec	in^2/sec
1	0.0625	0.001817	1.025	0.24	0.2	0.3	2.47e-003	1.66e-003	1.98e-003
2	0.125	0.005108	1.016	0.68	0.8	0.4	5.49e-004	1.14e-003	7.42e-004
3	0.5	0.02255	0.969	3.01	2.3	0.0	1.98e-004	0.00e+000	1.98e-004
4	1	0.03926	0.924	5.23	2.4	2.8	1.81e-004	1.52e-004	1.65e-004
5	2	0.06102	0.865	8.14	2.0	2.6	1.99e-004	1.55e-004	1.74e-004
6	4	0.0883	0.791	11.77	2.2	2.5	1.73e-004	1.51e-004	1.61e-004
7	8	0.1182	0.710	15.76	1.9	1.4	1.77e-004	2.39e-004	2.04e-004
8	16	0.1495	0.625	19.93	1.7	0.0	1.87e-004	0.00e+000	1.87e-004
9	4	0.1427	0.644	19.02	2.1	0.0	1.43e-004	0.00e+000	1.43e-004
10	0.25	0.1188	0.708	15.84	3.5	4.5	8.99e-005	7.00e-005	7.87e-005

CONSOLIDATION TEST DATA

SUMMARY REPORT





	Project: San Francisquito Bg	Location: 04-SCL 101-52.6	Project No.: 04-235620
	Boring No.: R10-002	Tested By: AZM	Checked By: CL#10-062
	Sample No.: 09B	Test Date: 9/14/2010	Depth: 48.5-49
	Test No.: 10 056-G3	Sample Type: Tube	Elevation:
	Description: Moist, brown, stiff, silt		
	Remarks: Bridge #35-0348		

Tue, 21-SEP-2010 13:52:07

CONSOLIDATION TEST DATA

Project: SAN FRANCISQUINTO
Boring No.: R10-002
Sample No.: 10B
Test No.: 10-057-G4

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/14/2010
Sample Type: TUBE

Project No.: 04-235620
Checked By: GL# 10-062
Depth: 52.5-53 MP 9/21
Elevation:

Soil Description: Moist, brown,med-soft, silt w/gravel
Remarks: Bridge 35-0348

Measured Specific Gravity: 2.73
Initial Void Ratio: 0.87
Final Void Ratio: 0.62

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	92.9	92.9	88.1	88.1
Wt. Container + Dry Soil, gm	76	76	76	76
Wt. Container, gm	22.8	22.8	22.8	22.8
Wt. Dry Soil, gm	53.2	53.2	53.2	53.2
Water Content, %	31.77	31.77	22.74	22.74
Void Ratio	---	0.87	0.62	---
Degree of Saturation, %	---	99.63	99.67	---
Dry Unit Weight, pcf	---	91.043	104.91	---

CONSOLIDATION TEST DATA

Project: SAN FRANCISQUINTO
Boring No.: R10-002
Sample No.: 10B
Test No.: 10-057-G4

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/14/2010
Sample Type: TUBE

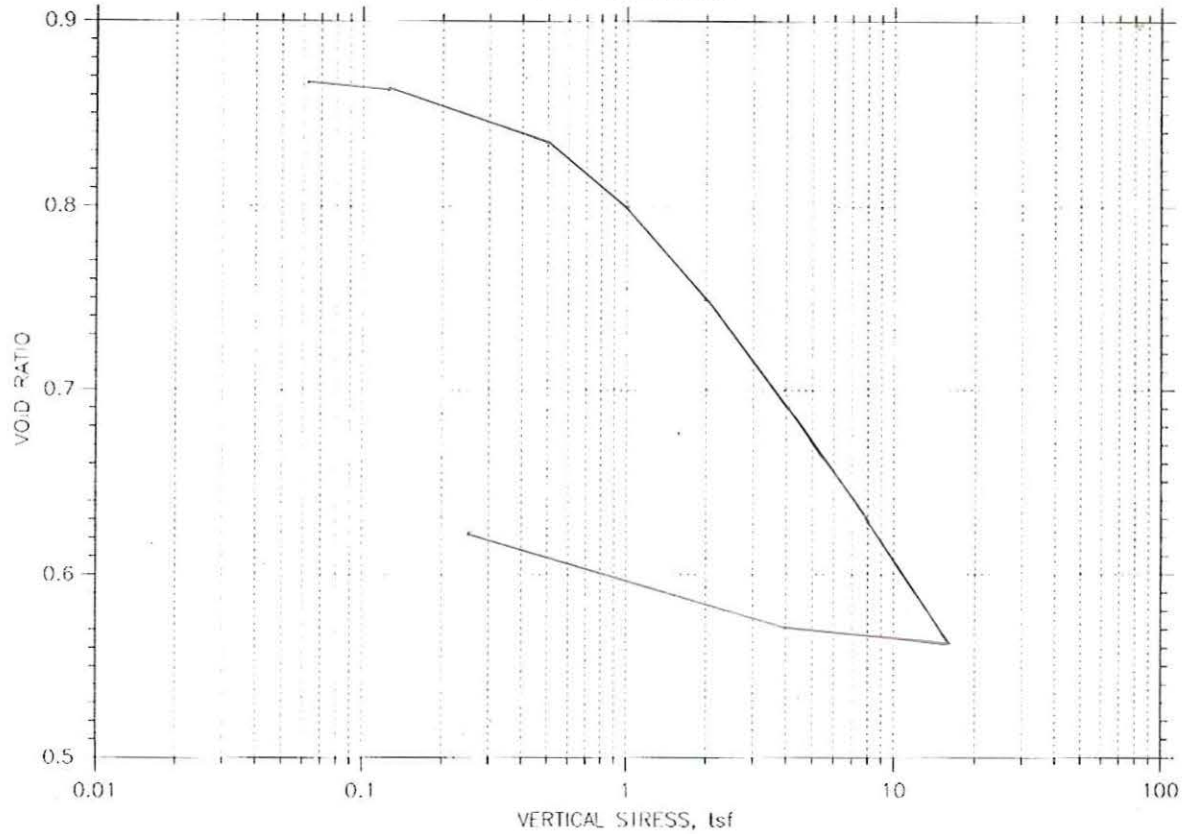
Project No.: 04-235620
Checked By: GL# 10-062
Depth: 52.5-53
Elevation:

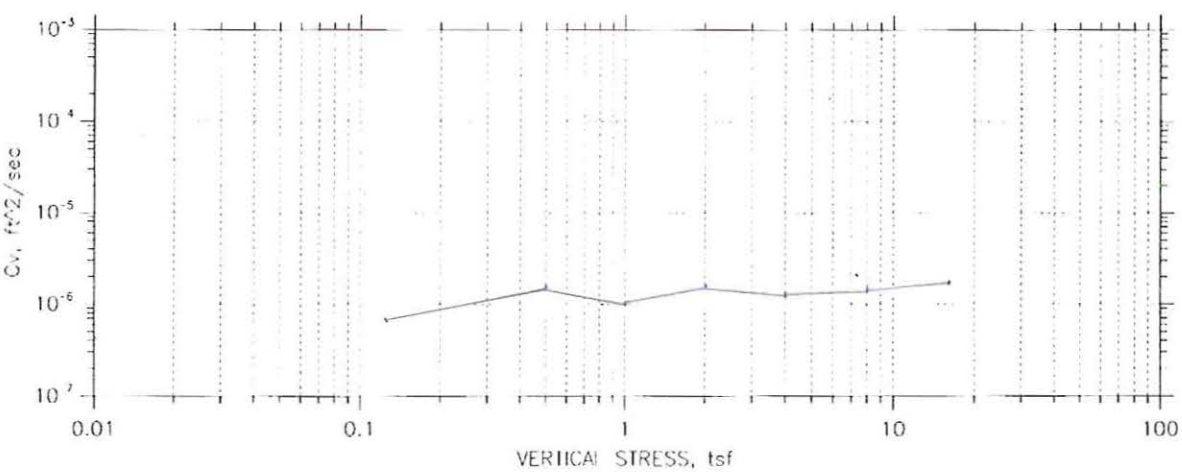
Soil Description: Moist, brown,med-soft, silty w/gravel
Remarks: Bridge 35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. ft^2/sec	Coefficient of Consolidation Log ft^2/sec	Coefficient of Consolidation Ave. ft^2/sec
1	0.0625	0.001078	0.867	0.14	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
2	0.125	0.002384	0.863	0.32	5.2	4.7	6.11e-007	6.81e-007	6.44e-007
3	0.5	0.01356	0.835	1.81	2.1	0.0	1.48e-006	0.00e+000	1.48e-006
4	1	0.02802	0.799	3.74	3.1	0.0	9.75e-007	0.00e+000	9.75e-007
5	2	0.04777	0.750	6.37	1.9	0.0	1.49e-006	0.00e+000	1.49e-006
6	4	0.07147	0.691	9.53	1.8	2.7	1.52e-006	1.02e-006	1.22e-006
7	8	0.09631	0.629	12.84	1.4	2.3	1.84e-006	1.12e-006	1.39e-006
8	16	0.1229	0.563	16.39	1.2	1.5	1.95e-006	1.51e-006	1.70e-006
9	4	0.1197	0.571	15.96	0.3	0.0	8.35e-006	1.20e-004	1.56e-005
10	0.25	0.09917	0.622	13.22	2.6	3.2	8.87e-007	7.36e-007	8.05e-007

CONSOLIDATION TEST DATA

SUMMARY REPORT





Project: SAN FRANCISQUINTO	Location: 04-SCL-101-52.6	Project No.: 04-235620
Boring No.: R10-002	Tested By: AZM	Checked By: GL# 10-062
Sample No.: 10B	Test Date: 9/14/2010	Depth: 52.5-53
Test No.: 10-057 C4	Sample Type: TUBE	Elevation:
Description: Moist, brown,med-soft, silty w/gravel		
Remarks: Bridge 35-0348		

Tue, 21-SEP-2010 13:58:22

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 09C
Test No.: 10-058-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/15/10
Sample Type: Tube

Project No.: 04-235620
Checked By: GL# 10-062
Depth: 48.5-49
Elevation: 10 9/22

Soil Description: MOIST, OLIVE, VERY STIFF, SILT
Remarks: BRIDGE# 35-0348

Measured Specific Gravity: 2.73
Initial Void Ratio: 0.77
Final Void Ratio: 0.51

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	95.4	95.4	90.1	90.1
Wt. Container + Dry Soil, gm	79.6	79.6	79.6	79.6
Wt. Container, gm	23.3	23.3	23.3	23.3
Wt. Dry Soil, gm	56.3	56.3	56.3	56.3
Water Content, %	28.06	28.06	18.65	18.65
Void Ratio	---	0.77	0.51	---
Degree of Saturation, %	---	99.74	99.50	---
Dry Unit Weight, pcf	---	96.348	112.68	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 09C
Test No.: 10-058-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/15/10
Sample Type: Tube

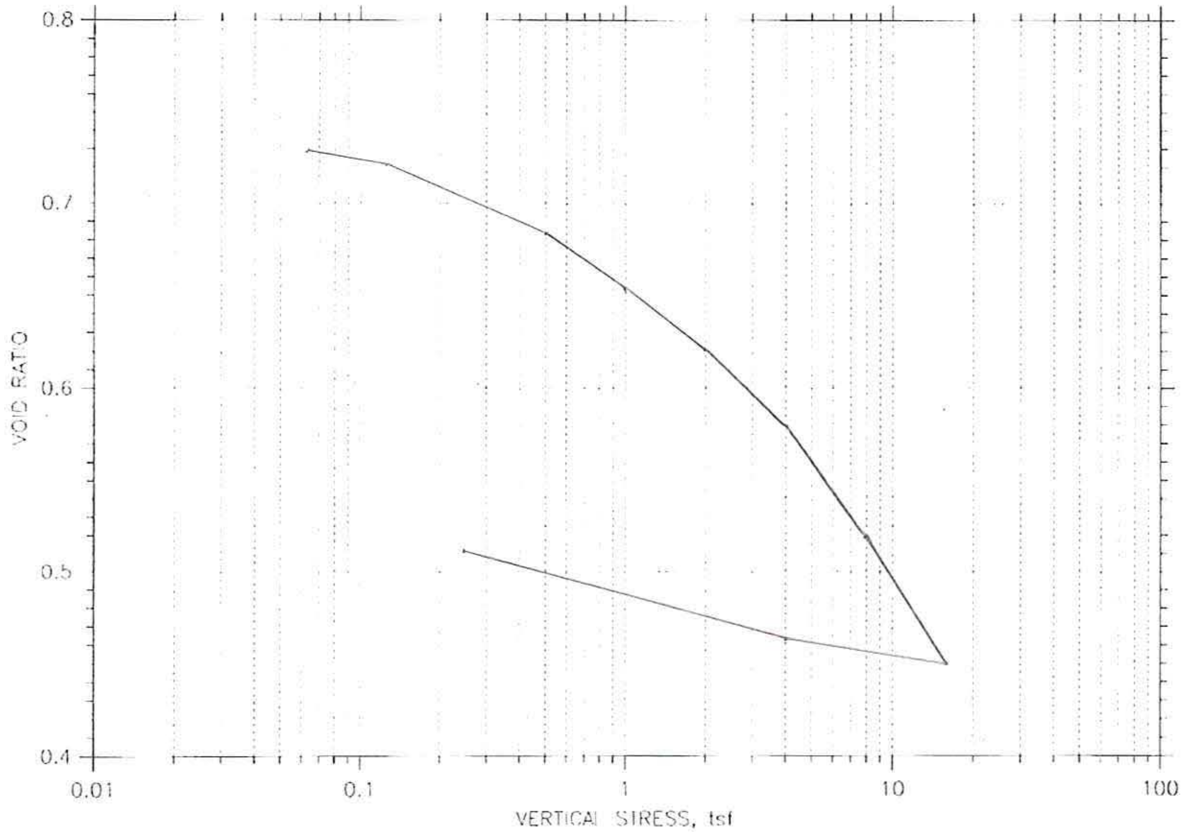
Project No.: 04-235620
Checked By: GL# 10-062
Depth: 48.5-49
Elevation:

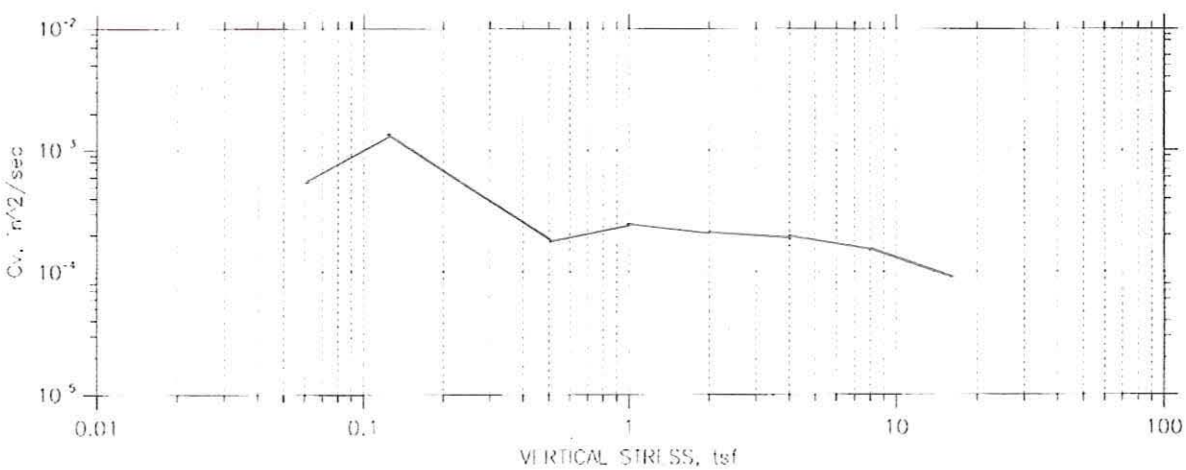
Soil Description: MOIST, OLIVE, VERY STIFF, SILT
Remarks: BRIDGE# 35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.0625	0.01624	0.729	2.17	0.9	0.8	5.10e-004	5.98e-004	5.50e-004
2	0.125	0.01971	0.721	2.63	0.4	0.3	1.18e-003	1.54e-003	1.34e-003
3	0.5	0.03575	0.683	4.77	2.3	0.0	1.83e-004	0.00e+000	1.83e-004
4	1	0.04813	0.654	6.42	2.1	1.3	1.98e-004	3.17e-004	2.44e-004
5	2	0.06176	0.622	8.23	1.8	2.0	2.25e-004	1.95e-004	2.09e-004
6	4	0.07936	0.581	10.58	2.5	1.4	1.51e-004	2.64e-004	1.92e-004
7	8	0.1052	0.520	14.02	2.1	2.5	1.68e-004	1.45e-004	1.56e-004
8	16	0.1348	0.450	17.97	3.6	3.5	8.98e-005	9.22e-005	9.10e-005
9	4	0.1293	0.463	17.23	0.7	0.0	4.75e-004	0.00e+000	4.75e-004
10	0.25	0.1087	0.511	14.50	7.1	2.8	4.64e-005	1.17e-004	6.64e-005

CONSOLIDATION TEST DATA

SUMMARY REPORT





Project: San Francisquito Bg	Location: 04-SCL-101 52.6	Project No.: 04-235620
Boring No.: R10-003	Tested By: AZM	Checked By: GL# 10-062
Sample No.: 09C	Test Date: 9/15/10	Depth: 48.5-49
Test No.: 10-058-G1	Sample Type: Tube	Elevation:
Description: MOIST, OLIVE, VERY STIFF, SILT		
Remarks: BRIDGE# 35 0348		

Wed. 22-SEP-2010 09:25:47

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 10B
Test No.: 10-059-G3

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/14/2010
Sample Type: Tube

Project No.: 04-235620
Checked By: GL#10-062
Depth: 54-54.5
Elevation: lp 9/22

Soil Description: Moist, olive, stiff, silt
Remarks: Bridge #35-0348

Measured Specific Gravity: 2.73
Initial Void Ratio: 0.63
Final Void Ratio: 0.41

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	101.7	101.7	96.8	96.8
Wt. Container + Dry Soil, gm	87.7	87.7	87.7	87.7
Wt. Container, gm	26.6	26.6	26.6	26.6
Wt. Dry Soil, gm	61.1	61.1	61.1	61.1
Water Content, %	22.91	22.91	14.89	14.89
Void Ratio	---	0.63	0.41	---
Degree of Saturation, %	---	99.59	99.65	---
Dry Unit Weight, pcf	---	104.56	120.88	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 10B
Test No.: 10-059-G3

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/14/2010
Sample Type: Tube

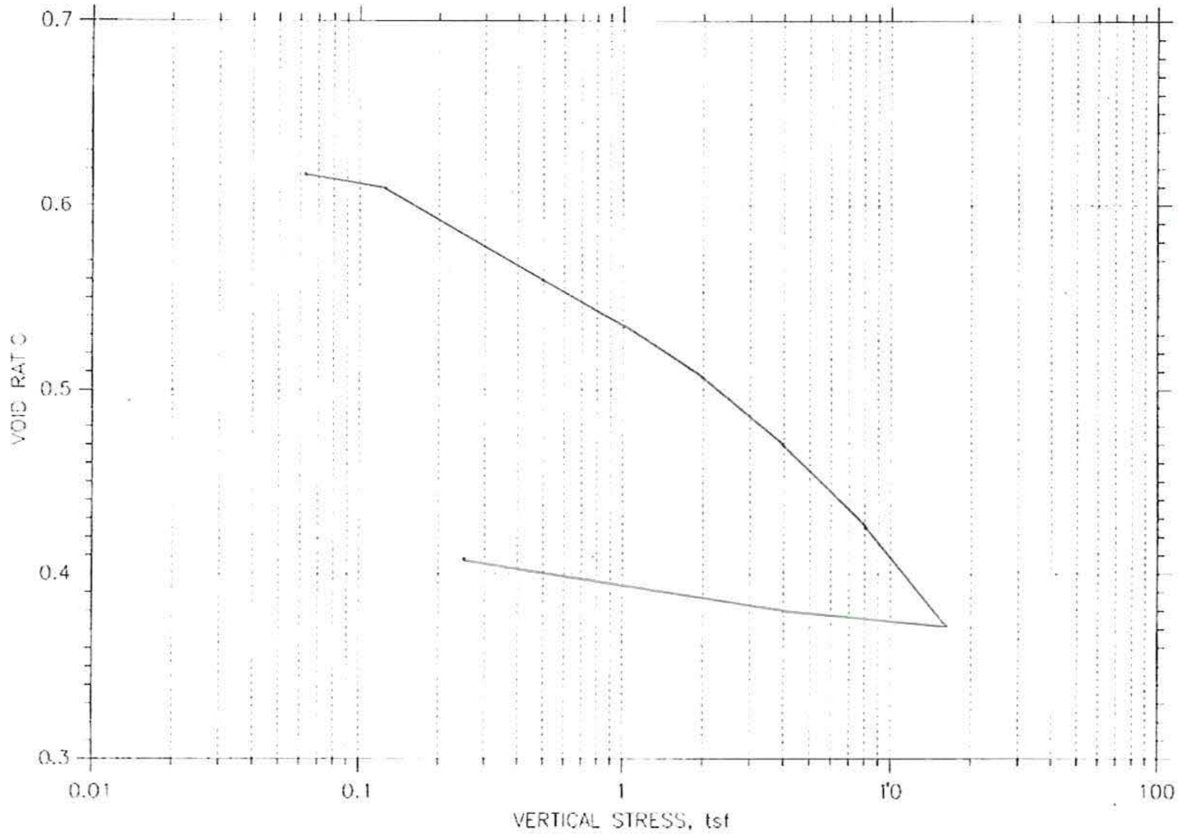
Project No.: 04-235620
Checked By: GL#10-062
Depth: 54-54.5
Elevation:

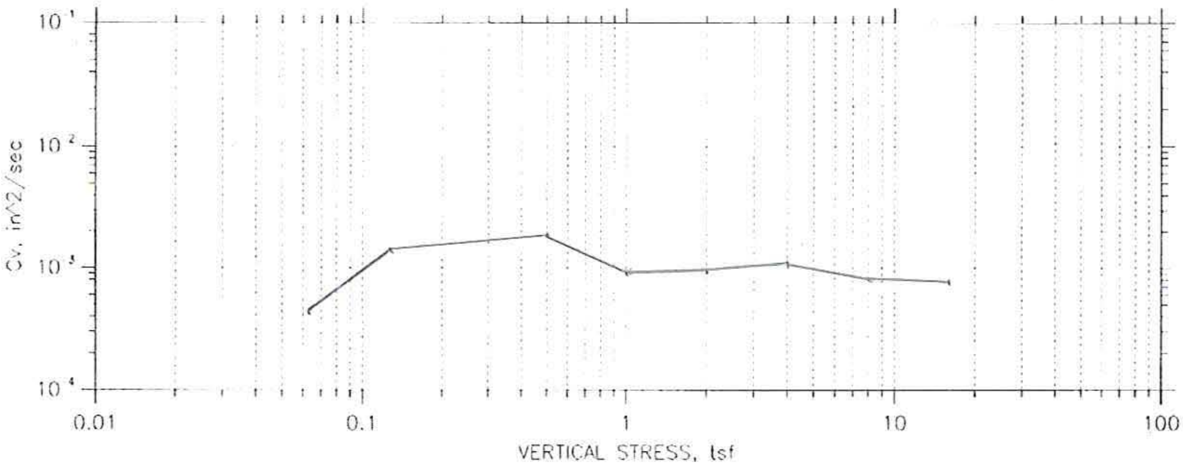
Soil Description: Moist, olive, stiff, silt
Remarks: Bridge #35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.0625	0.00467	0.617	0.62	1.1	0.0	4.19e-004	0.00e+000	4.19e-004
2	0.125	0.007961	0.610	1.06	0.4	0.3	1.23e-003	1.42e-003	1.32e-003
3	0.5	0.03111	0.559	4.15	0.3	0.2	1.52e-003	2.24e-003	1.81e-003
4	1	0.04221	0.535	5.63	0.5	0.0	8.90e-004	0.00e+000	8.90e-004
5	2	0.05531	0.507	7.38	0.5	0.4	8.27e-004	1.09e-003	9.40e-004
6	4	0.07216	0.470	9.62	0.5	0.2	7.96e-004	1.84e-003	1.11e-003
7	8	0.0927	0.426	12.36	0.6	0.3	5.80e-004	1.20e-003	7.82e-004
8	16	0.1175	0.372	15.67	0.5	0.4	7.07e-004	8.02e-004	7.51e-004
9	4	0.1138	0.380	15.18	0.0	0.0	1.61e-002	2.12e-002	1.83e-002
10	0.25	0.1013	0.407	13.50	1.9	0.5	1.82e-004	6.43e-004	2.84e-004

CONSOLIDATION TEST DATA

SUMMARY REPORT





	Project: San Francisquito Bg	Location: 04-SCL-101-52.6	Project No.: 04-235620
	Boring No.: R10-003	Tested By: A/M	Checked By: GL#10-062
	Sample No.: 10B	Test Date: 9/14/2010	Depth: 54-54.5
	Test No.: 10-059-C3	Sample Type: Tube	Elevation:
	Description: Moist, olive, stiff, silt		
	Remarks: Bridge #35-0348		

CONSOLIDATION TEST DATA

Project: SAN FRANCISQUINTO
Boring No.: R10-003
Sample No.: 11C
Test No.: 10-060-G4

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/15/2010
Sample Type: TUBE

Project No.: 04-235620
Checked By: GL# 10-062
Depth: 58.5-59
Elevation:

Soil Description: Moist, olive, very stiff, silt w/gravel
Remarks: Bridge 35-0348

Measured Specific Gravity: 2.73
Initial Void Ratio: 0.73
Final Void Ratio: 0.53

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	100.3	100.3	96	96
Wt. Container + Dry Soil, gm	84.9	84.9	84.9	84.9
Wt. Container, gm	27.5	27.5	27.5	27.5
Wt. Dry Soil, gm	57.4	57.4	57.4	57.4
Water Content, %	26.83	26.83	19.34	19.34
Void Ratio	---	0.73	0.53	---
Degree of Saturation, %	---	99.65	99.82	---
Dry Unit Weight, pcf	---	98.23	111.47	---

CONSOLIDATION TEST DATA

Project: SAN FRANCISQUINTO
Boring No.: R10-003
Sample No.: 11C
Test No.: 10-060-G4

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/15/2010
Sample Type: TUBE

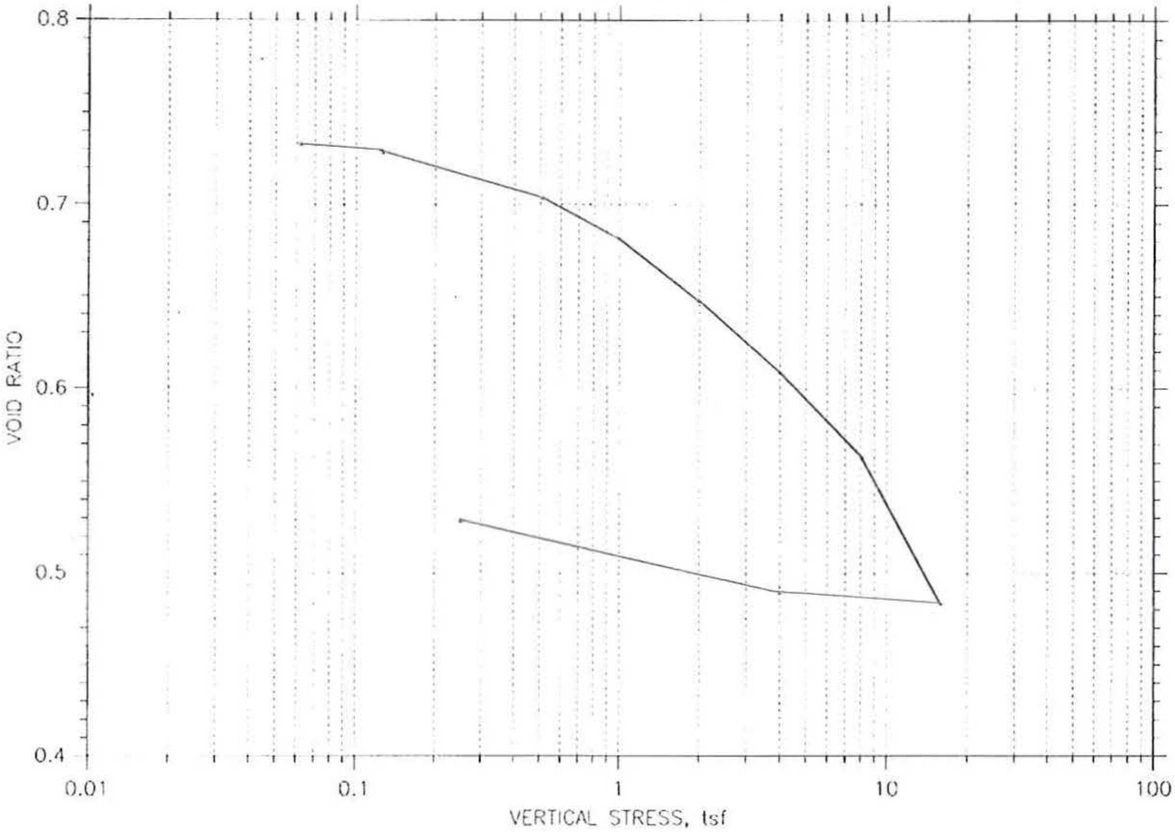
Project No.: 04-235620
Checked By: GL# 10-062
Depth: 58.5-59
Elevation:

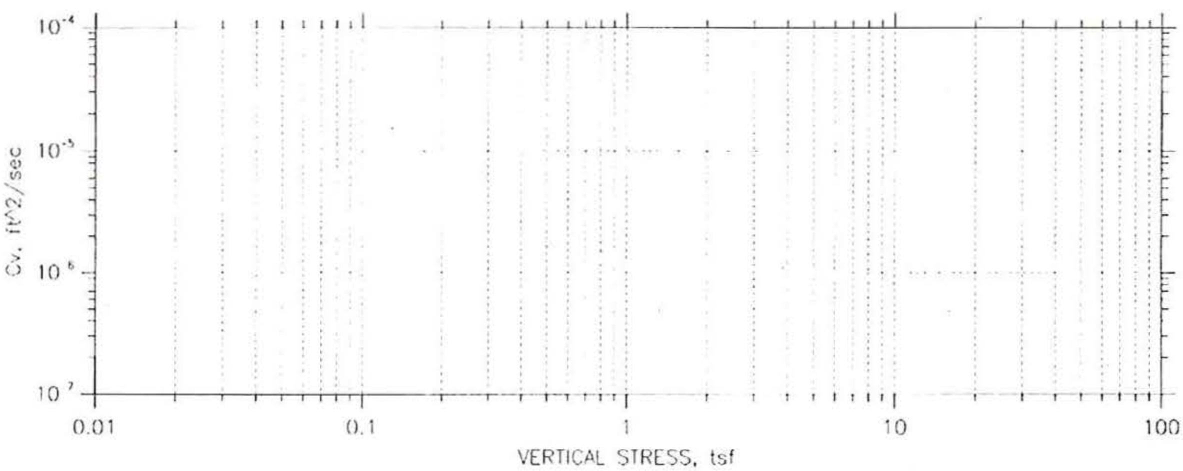
Soil Description: Moist, olive, very stiff, silt w/gravel
Remarks: Bridge 35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. ft^2/sec	Coefficient of Consolidation Log ft^2/sec	Coefficient of Consolidation Ave. ft^2/sec
1	0.0625	0.001015	0.733	0.14	0.3	0.0	9.18e-006	0.00e+000	9.18e-006
2	0.125	0.002384	0.729	0.32	0.2	0.2	1.56e-005	1.66e-005	1.61e-005
3	0.5	0.01347	0.704	1.80	1.8	0.0	1.78e-006	0.00e+000	1.78e-006
4	1	0.02321	0.681	3.09	2.2	0.0	1.38e-006	0.00e+000	1.38e-006
5	2	0.03761	0.648	5.01	2.4	2.6	1.24e-006	1.13e-006	1.18e-006
6	4	0.05433	0.609	7.24	2.3	2.8	1.21e-006	1.00e-006	1.10e-006
7	8	0.07357	0.565	9.81	1.9	3.1	1.41e-006	8.69e-007	1.08e-006
8	16	0.1088	0.483	14.51	5.2	6.0	4.78e-007	4.10e-007	4.42e-007
9	4	0.1062	0.489	14.16	0.9	0.0	2.60e-006	0.00e+000	2.60e-006
10	0.25	0.0891	0.529	11.88	5.1	0.0	4.73e-007	0.00e+000	4.73e-007

CONSOLIDATION TEST DATA

SUMMARY REPORT





Project: SAN FRANCISQUINTO	Location: 04-SCL-101-52.6	Project No.: 04-235620
Boring No.: R10-003	Tested By: AZM	Checked By: GL# 10-062
Sample No.: 11C	Test Date: 9/15/2010	Depth: 58.5-59
Test No.: 10-060-G4	Sample Type: TUBE	Elevation:
Description: Moist, olive, very stiff, silt w/gravel		
Remarks: Bridge 35-0348		

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 12B
Test No.: 10-061-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/16/10
Sample Type: Tube

Project No.: 04-235620
Checked By: GL# 10-062
Depth: 64-64.5 ip 9/22
Elevation:

Soil Description: MOIST, OLIVE, VERY STIFF, SILT
Remarks: BRIDGE# 35-0348

Measured Specific Gravity: 2.75
Initial Void Ratio: 0.88
Final Void Ratio: 0.61

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	97.2	97.2	92.5	92.5
Wt. Container + Dry Soil, gm	80.7	80.7	80.7	80.7
Wt. Container, gm	27.5	27.5	27.5	27.5
Wt. Dry Soil, gm	53.2	53.2	53.2	53.2
Water Content, %	31.02	31.02	22.18	22.18
Void Ratio	---	0.88	0.61	---
Degree of Saturation, %	---	96.42	99.30	---
Dry Unit Weight, pcf	---	91.043	106.28	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 12B
Test No.: 10-061-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/16/10
Sample Type: Tube

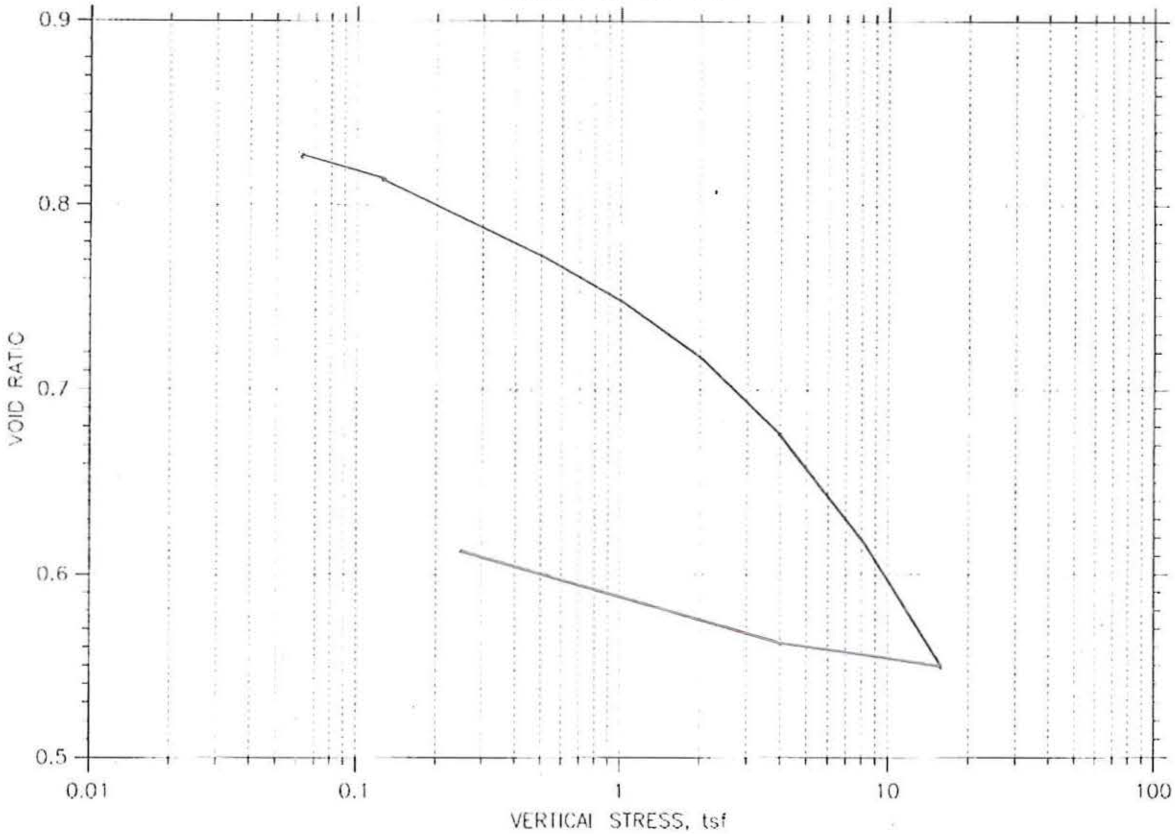
Project No.: 04-235620
Checked By: GL# 10-062
Depth: 64-64.5
Elevation:

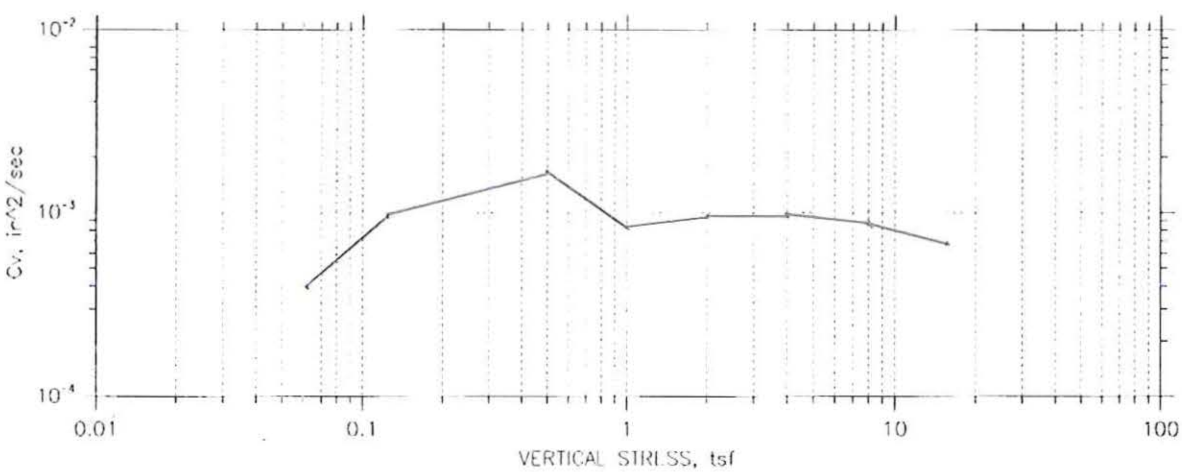
Soil Description: MOIST, OLIVE, VERY STIFF, SILT
Remarks: BRIDGE# 35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.0625	0.02247	0.827	3.00	1.3	1.0	3.36e-004	4.49e-004	3.85e-004
2	0.125	0.02766	0.814	3.69	0.5	0.4	7.98e-004	1.11e-003	9.29e-004
3	0.5	0.0442	0.773	5.89	0.4	0.1	1.18e-003	2.87e-003	1.67e-003
4	1	0.05376	0.749	7.17	0.6	0.4	7.25e-004	9.39e-004	8.18e-004
5	2	0.06578	0.718	8.77	0.6	0.2	6.44e-004	1.64e-003	9.26e-004
6	4	0.08228	0.677	10.97	0.5	0.3	8.00e-004	1.16e-003	9.48e-004
7	8	0.105	0.620	14.00	0.4	0.4	7.88e-004	9.41e-004	8.58e-004
8	16	0.1333	0.549	17.78	0.6	0.4	5.84e-004	7.85e-004	6.69e-004
9	4	0.1281	0.562	17.09	0.1	0.0	4.53e-003	0.00e+000	4.53e-003
10	0.25	0.1075	0.614	14.34	0.9	0.0	3.72e-004	0.00e+000	3.72e-004

CONSOLIDATION TEST DATA

SUMMARY REPORT





	Project: San Francisquito Bg	Location: 04 SCL-101-52.6	Project No.: 04-235620
	Boring No.: R10-003	Tested By: AZM	Checked By: GL# 10-062
	Sample No.: 12B	Test Date: 9/16/10	Depth: 64-64.5
	Test No.: 10 061-G1	Sample Type: Tube	Elevation:
	Description: MOIST, OLIVE, VERY STIFF, SILT		
	Remarks: BRIDGE# 35 0348		

Wed, 22-SEP-2010 14:20:36

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 13C
Test No.: 10-062-G3

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/14/2010
Sample Type: Tube

Project No.: 04-235620
Checked By: GL#10-062
Depth: 68.5-69
Elevation: VP 9/23

Soil Description: Moist, olive, very stiff, silt
Remarks: Bridge #35-0348

Measured Specific Gravity: 2.79
Initial Void Ratio: 0.80
Final Void Ratio: 0.65

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	100.3	100.3	97.1	97.1
Wt. Container + Dry Soil, gm	84.1	84.1	84.1	84.1
Wt. Container, gm	27.6	27.6	27.6	27.6
Wt. Dry Soil, gm	56.5	56.5	56.5	56.5
Water Content, %	28.67	28.67	23.01	23.01
Void Ratio	---	0.80	0.65	---
Degree of Saturation, %	---	99.74	99.47	---
Dry Unit Weight, pcf	---	96.69	105.9	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 13C
Test No.: 10-062-G3

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/14/2010
Sample Type: Tube

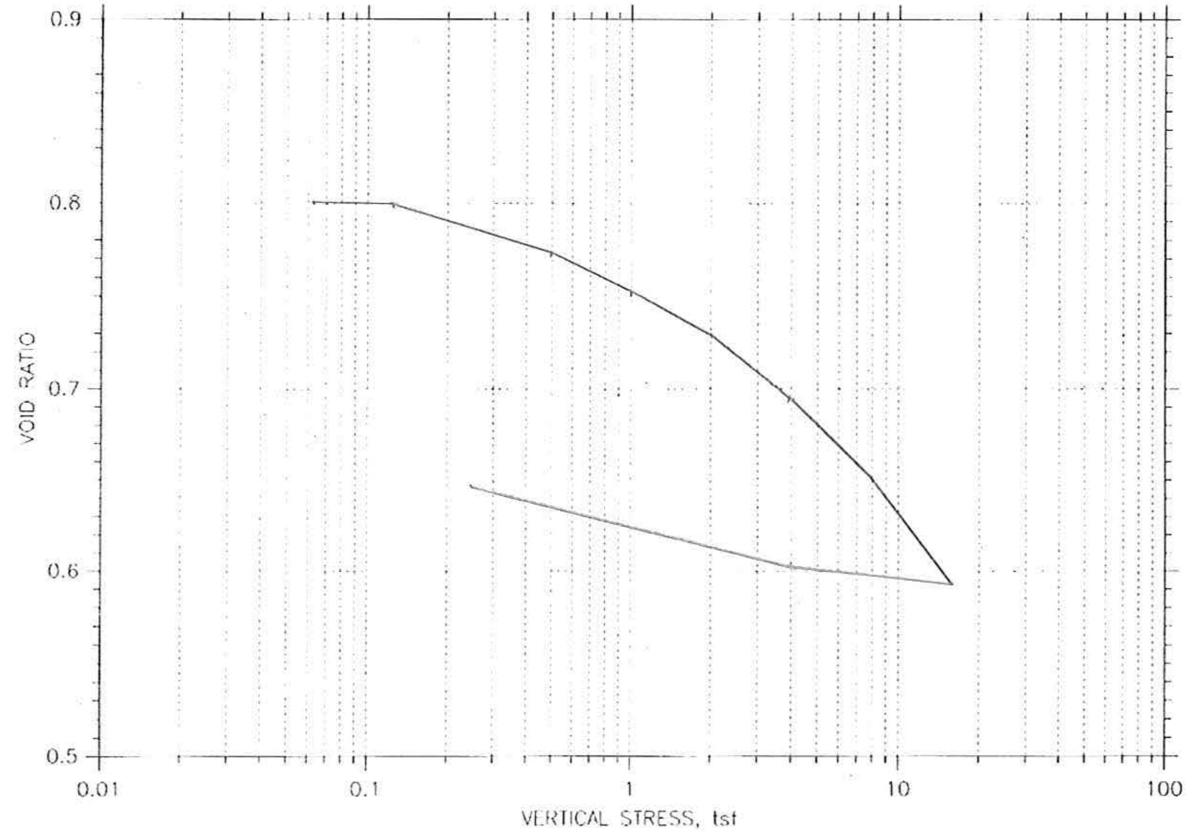
Project No.: 04-235620
Checked By: GL#10-062
Depth: 68.5-69
Elevation:

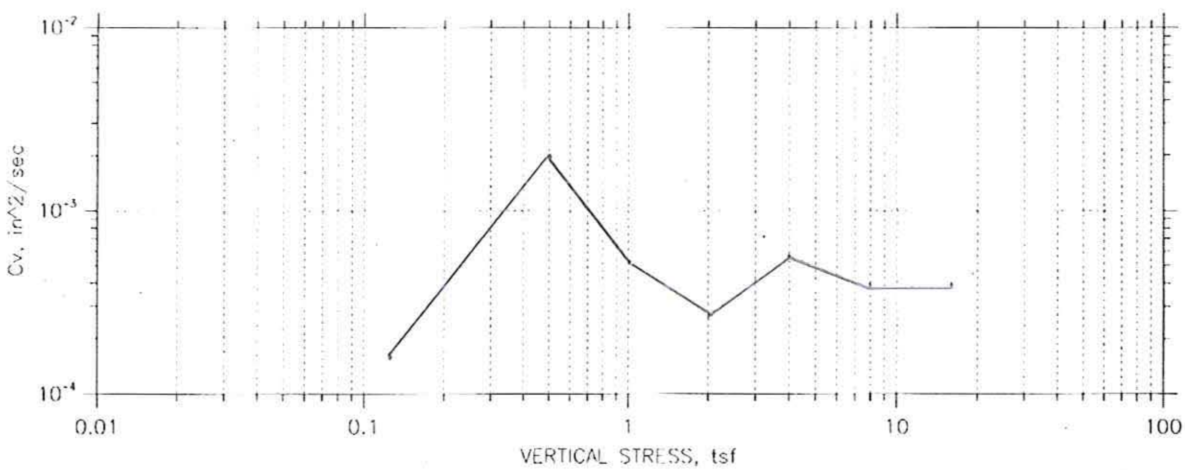
Soil Description: Moist, olive, very stiff, silt
Remarks: Bridge #35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.0625	0.001128	0.800	0.15	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
2	0.125	0.001861	0.798	0.25	2.9	0.0	1.58e-004	0.00e+000	1.58e-004
3	0.5	0.01212	0.774	1.62	0.3	0.2	1.64e-003	2.40e-003	1.95e-003
4	1	0.02096	0.752	2.79	0.9	0.9	5.13e-004	5.18e-004	5.15e-004
5	2	0.03042	0.730	4.06	1.6	0.0	2.70e-004	0.00e+000	2.70e-004
6	4	0.04432	0.696	5.91	0.8	0.7	4.95e-004	6.22e-004	5.51e-004
7	8	0.06308	0.651	8.41	0.9	1.2	4.34e-004	3.27e-004	3.73e-004
8	16	0.08753	0.592	11.67	0.9	1.0	3.95e-004	3.70e-004	3.82e-004
9	4	0.08381	0.601	11.18	0.3	0.0	1.24e-003	0.00e+000	1.24e-003
10	0.25	0.06525	0.646	8.70	1.4	1.2	2.76e-004	3.12e-004	2.93e-004

CONSOLIDATION TEST DATA

SUMMARY REPORT





Project: San Francisquito Bg	Location: 04 SCL-101-52.6	Project No.: 04-235620
Boring No.: R10 003	Tested By: AZM	Checked By: GL#10-062
Sample No.: 13C	Test Date: 9/14/2010	Depth: 68.5-69
Test No.: 10-062-G3	Sample Type: Tube	Elevation:
Description: Moist, olive, very stiff, silt		
Remarks: Bridge #35-0348		

CONSOLIDATION TEST DATA

Project: SAN FRANCISQUINTO
Boring No.: R10-003
Sample No.: 15A
Test No.: 10-063-G4

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/16/2010
Sample Type: TUBE

Project No.: 04-235620
Checked By: GL# 10-062
Depth: 79.5-80 IP 9/23
Elevation:

Soil Description: Moist, olive, very stiff, silt
Remarks: Bridge 35-0348

Measured Specific Gravity: 2.62
Initial Void Ratio: 0.74
Final Void Ratio: 0.66

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	97.8	97.8	96.1	96.1
Wt. Container + Dry Soil, gm	82.3	82.3	82.3	82.3
Wt. Container, gm	27.5	27.5	27.5	27.5
Wt. Dry Soil, gm	54.8	54.8	54.8	54.8
Water Content, %	28.28	28.28	25.18	25.18
Void Ratio	---	0.74	0.66	---
Degree of Saturation, %	---	99.80	99.92	---
Dry Unit Weight, pcf	---	93.781	98.423	---

CONSOLIDATION TEST DATA

Project: SAN FRANCISQUINTO
Boring No.: R10-003
Sample No.: 15A
Test No.: 10-063-G4

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/16/2010
Sample Type: TUBE

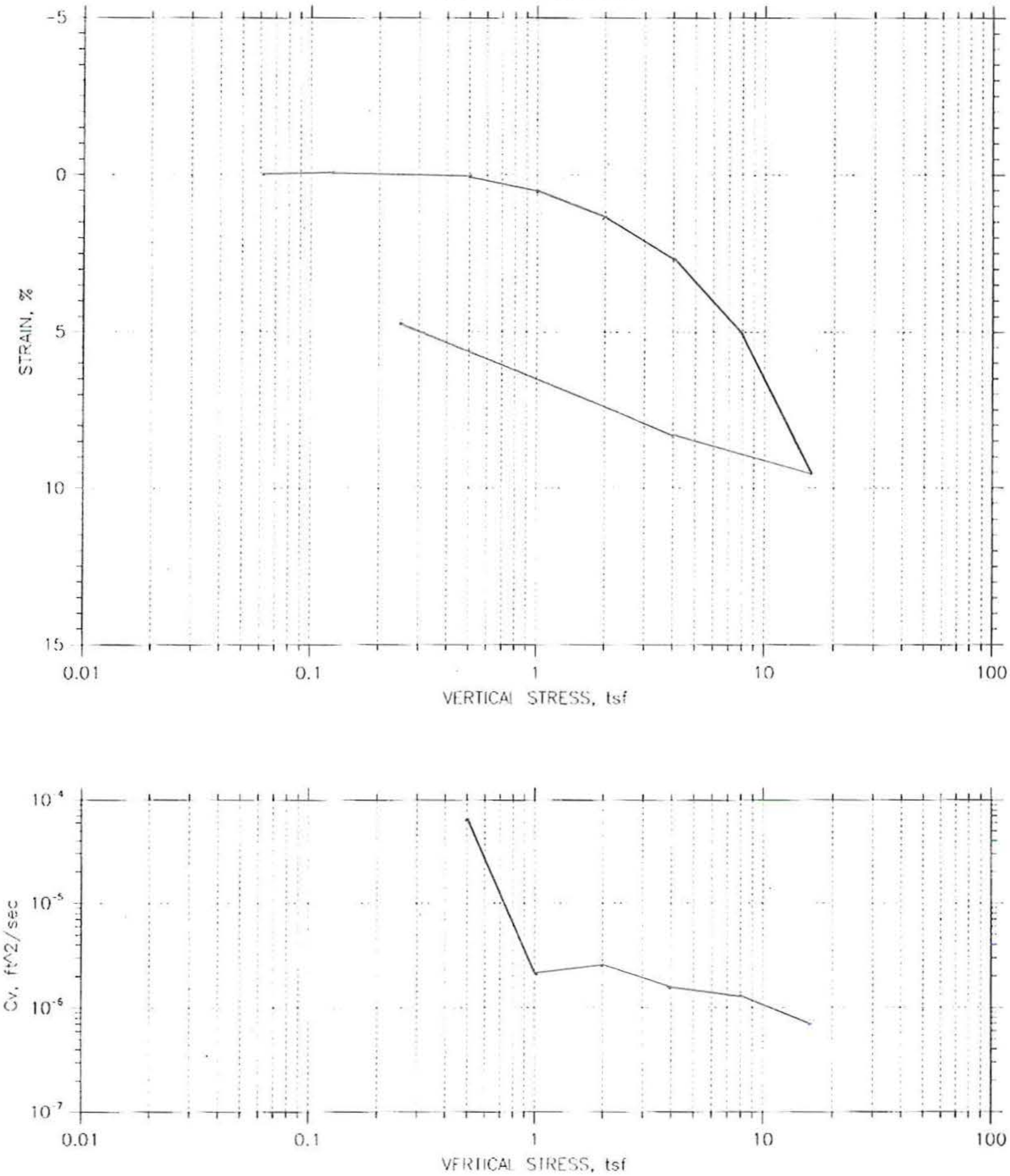
Project No.: 04-235620
Checked By: GL# 10-062
Depth: 79.5-80
Elevation:

Soil Description: Moist, olive, very stiff, silt
Remarks: Bridge 35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. ft^2/sec	Coefficient of Consolidation Log ft^2/sec	Coefficient of Consolidation Ave. ft^2/sec
1	0.0625	-0.0002274	0.742	-0.03	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
2	0.125	-0.0007688	0.743	-0.10	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
3	0.5	0.0005357	0.740	0.07	0.1	0.0	6.42e-005	0.00e+000	6.42e-005
4	1	0.003881	0.732	0.52	1.5	0.0	2.10e-006	0.00e+000	2.10e-006
5	2	0.00987	0.718	1.32	1.2	0.0	2.57e-006	0.00e+000	2.57e-006
6	4	0.01971	0.696	2.63	2.0	2.0	1.54e-006	1.52e-006	1.53e-006
7	8	0.03799	0.653	5.07	2.1	2.6	1.44e-006	1.15e-006	1.28e-006
8	16	0.0715	0.575	9.53	4.0	0.0	6.96e-007	0.00e+000	6.96e-007
9	4	0.0622	0.597	8.29	1.6	0.0	1.70e-006	0.00e+000	1.70e-006
10	0.25	0.03538	0.659	4.72	7.6	9.1	3.71e-007	3.07e-007	3.36e-007

CONSOLIDATION TEST DATA

SUMMARY REPORT



	Project: SAN FRANCISQUINTO	Location: 04-SCI-101-52.6	Project No.: 04-235620
	Boring No.: R10-003	Tested By: AZM	Checked By: GL# 10-062
	Sample No.: 15A	Test Date: 9/16/2010	Depth: 79.5-80
	Test No.: 10-063 G4	Sample Type: TUBE	Elevation:
	Description: Moist, olive, very stiff, silt		
	Remarks: Bridge 35-0348		

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CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 17C
Test No.: 10-064-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/20/10
Sample Type: Tube

Project No.: 04-235620
Checked By: GL# 10-062
Depth: 88.5-89
Elevation: 10 9/23

Soil Description: MOIST, OLIVE, VERY STIFF, SILT
Remarks: BRIDGE# 35-0348

Measured Specific Gravity: 2.84
Initial Void Ratio: 1.16
Final Void Ratio: 0.88

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	94	94	90	90
Wt. Container + Dry Soil, gm	75.3	75.3	75.3	75.3
Wt. Container, gm	27.4	27.4	27.4	27.4
Wt. Dry Soil, gm	47.9	47.9	47.9	47.9
Water Content, %	39.04	39.04	30.69	30.69
Void Ratio	---	1.16	0.88	---
Degree of Saturation, %	---	95.37	98.68	---
Dry Unit Weight, pcf	---	81.973	94.129	---

CONSOLIDATION TEST DATA

Project: San Francisquito Bg
Boring No.: R10-003
Sample No.: 17C
Test No.: 10-064-G1

Location: 04-SCL-101-52.6
Tested By: AZM
Test Date: 9/20/10
Sample Type: Tube

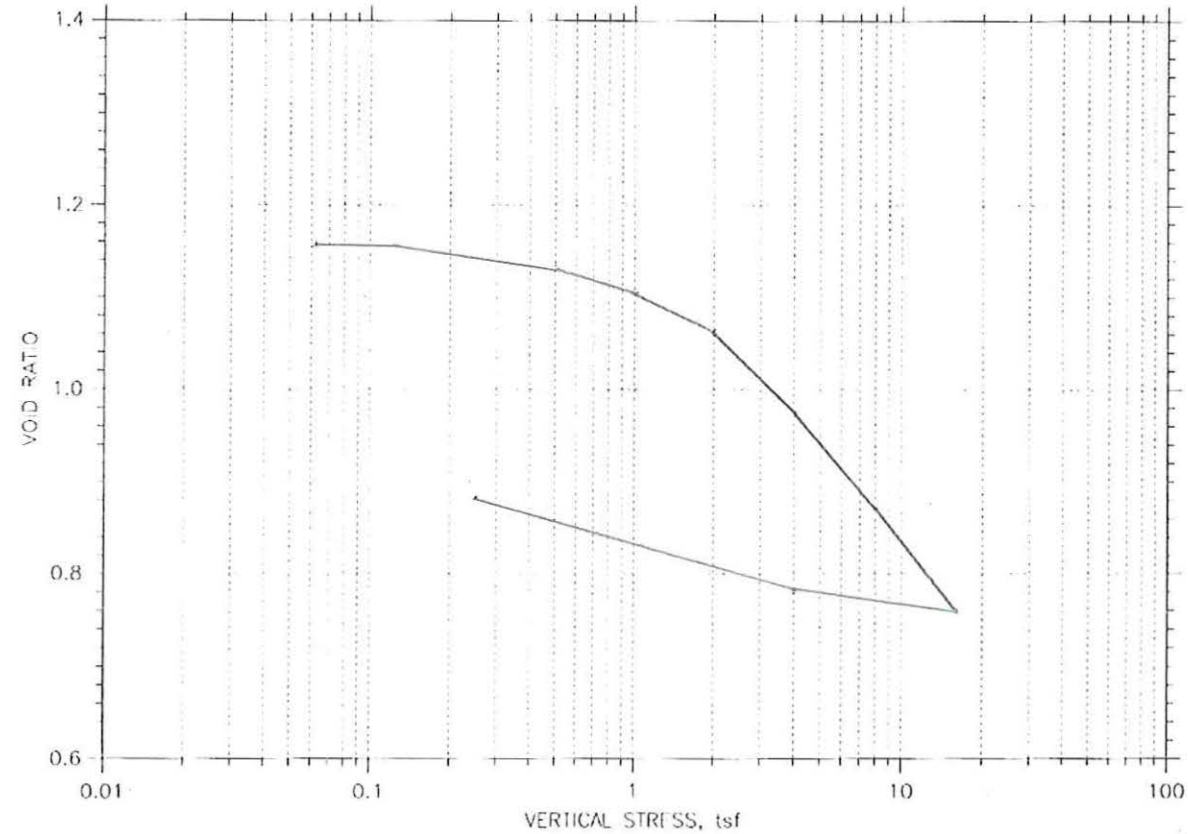
Project No.: 04-235620
Checked By: GL# 10-062
Depth: 88.5-89
Elevation:

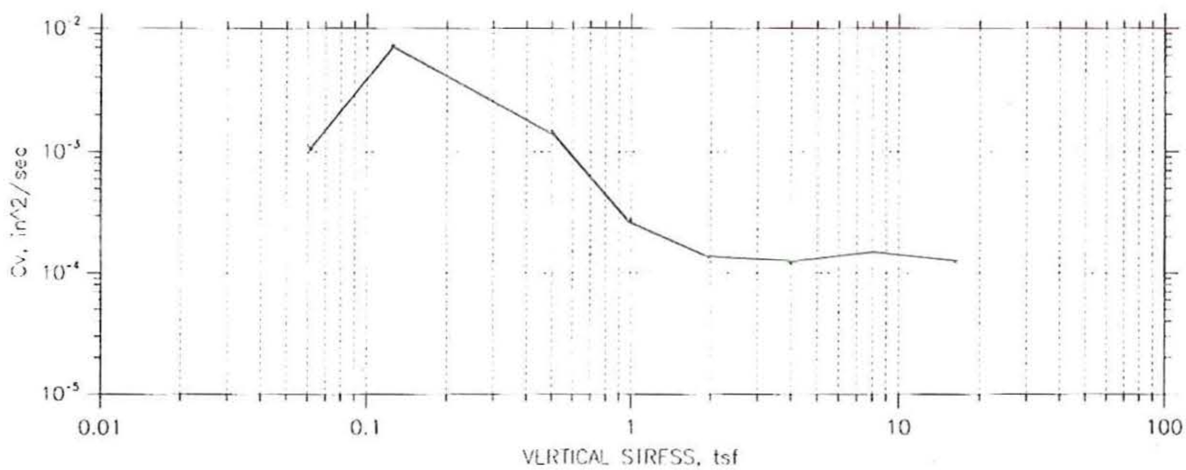
Soil Description: MOIST, OLIVE, VERY STIFF, SILT
Remarks: BRIDGE# 35-0348

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.0625	0.001904	1.157	0.25	0.5	0.4	9.67e-004	1.17e-003	1.06e-003
2	0.125	0.002211	1.156	0.29	0.1	0.0	7.03e-003	0.00e+000	7.03e-003
3	0.5	0.01131	1.129	1.51	0.5	0.1	9.42e-004	3.18e-003	1.45e-003
4	1	0.02021	1.104	2.70	1.7	0.0	2.61e-004	0.00e+000	2.61e-004
5	2	0.03415	1.064	4.55	3.4	3.0	1.27e-004	1.45e-004	1.35e-004
6	4	0.06478	0.975	8.64	3.5	3.1	1.14e-004	1.29e-004	1.21e-004
7	8	0.1011	0.871	13.48	2.0	2.9	1.81e-004	1.27e-004	1.50e-004
8	16	0.1407	0.757	18.76	2.4	2.7	1.34e-004	1.20e-004	1.26e-004
9	4	0.1314	0.783	17.52	1.6	0.0	1.93e-004	0.00e+000	1.93e-004
10	0.25	0.09686	0.883	12.91	7.1	3.7	4.65e-005	9.06e-005	6.15e-005

CONSOLIDATION TEST DATA

SUMMARY REPORT





	Project: San Francisquito Bg	Location: 04-SCL-101-52.6	Project No.: 04-235620
	Boring No.: R10-003	Tested By: AZM	Checked By: GL# 10-062
	Sample No.: 17C	Test Date: 9/20/10	Depth: 88.5-89
	Test No.: 10-064-G1	Sample Type: Tube	Elevation:
	Description: MOIST, OLIVE, VERY STIFF, SILT		
	Remarks: BRIDGE# 35-0348		

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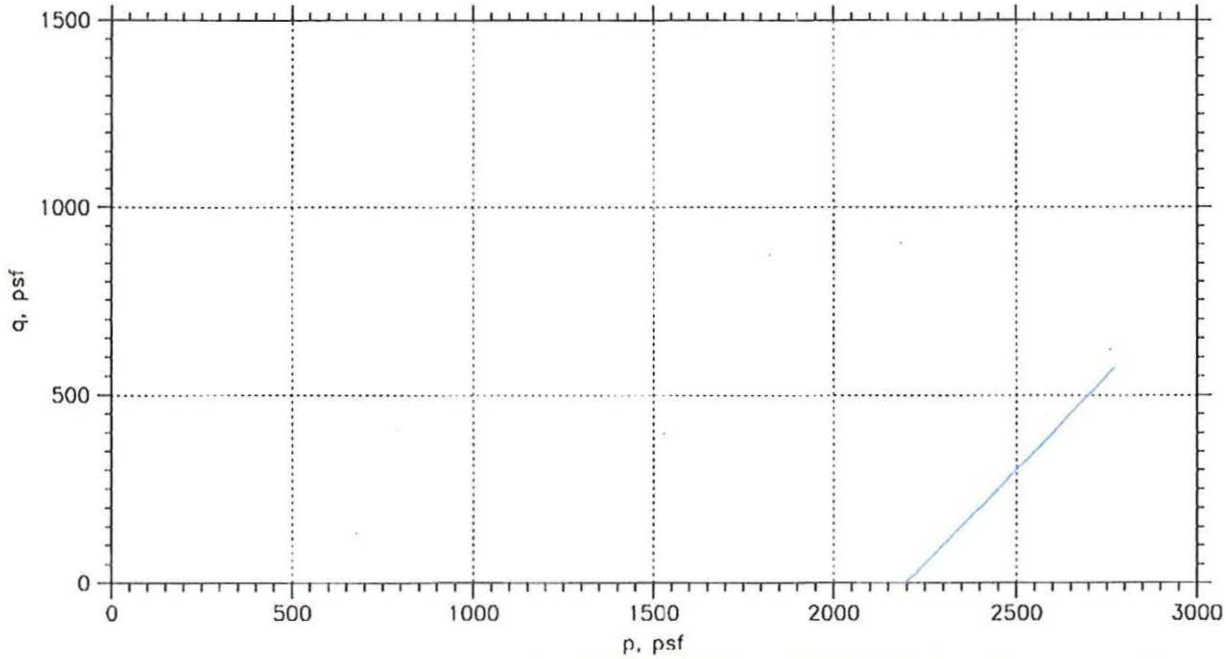
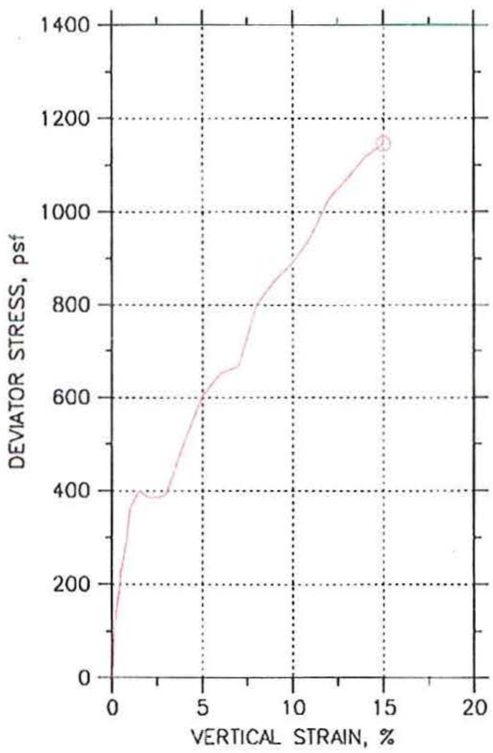
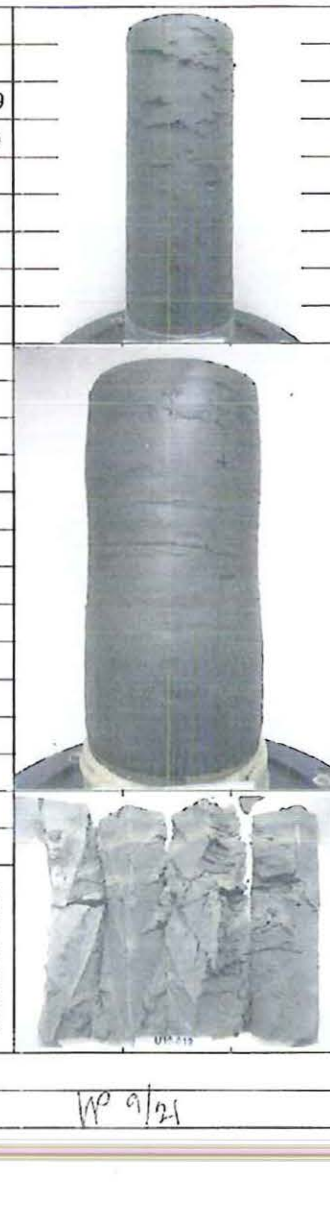
UNCONSOLIDATED UNDRAINED TRIAXIAL TEST





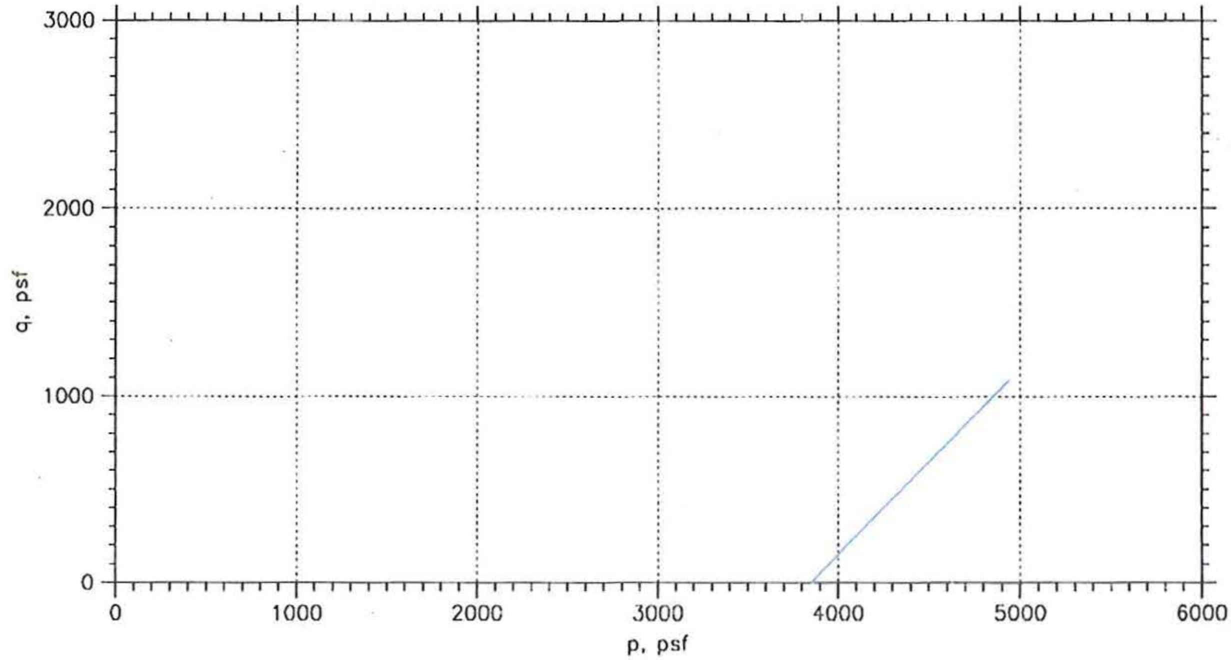
Symbol		⊙
Sample No.		P1
Test No.		U10-019
Depth		24-24.5
Initial	Diameter, in	2.375
	Height, in	5.95
	Water Content, %	40.7
	Dry Density, pcf	80.08
	Saturation, %	98.0
	Void Ratio	1.14
Before Shear	Water Content, %	
	Dry Density, pcf	
	Saturation*, %	
	Void Ratio	
	Back Press., psf	
Ver. Eff. Cons. Stress, psf		2196
Shear Strength, psf		573.3
Strain at Failure, %		15
Strain Rate, %/min		1
B-Value		---
Implied Specific Gravity		2.75
Liquid Limit		---
Plastic Limit		---

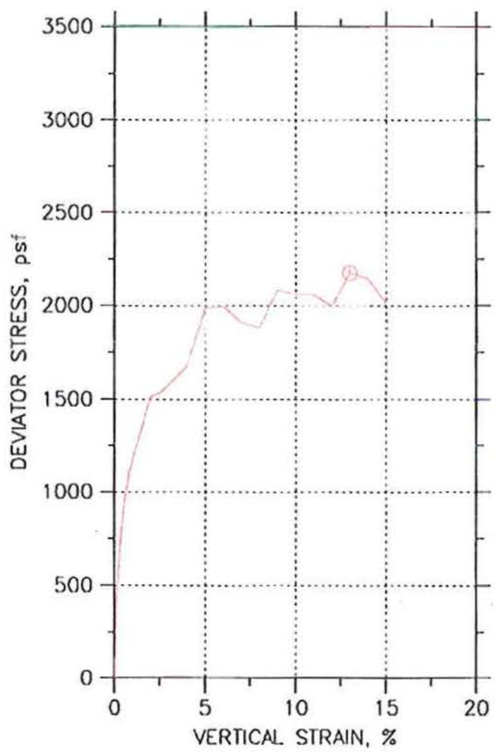


Caltrans

Project: San Francisquito Creek Br	
Location: 04-SCL-101-52.6	
Project No.: 04-235620	
Boring No.: R-10-001	
Sample Type: ASTM D2850	
Description: Moist, Firm, Brownish Dark Grey, Silty Clay w/Organics.	
Remarks:	WP 9/21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST



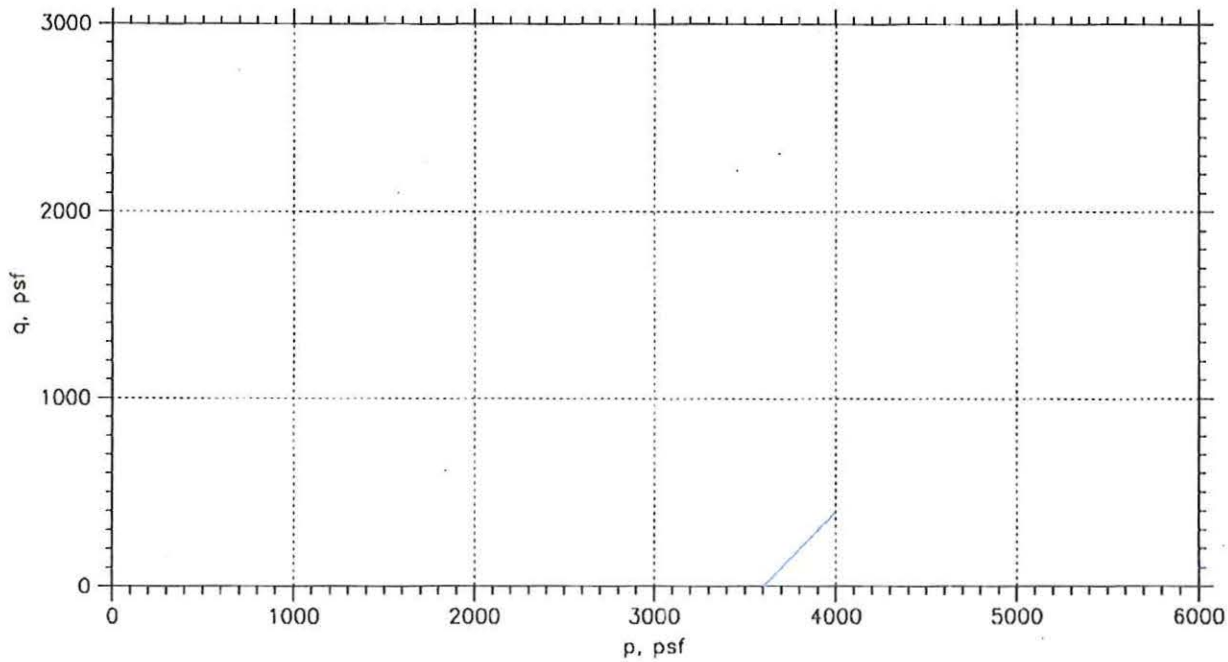


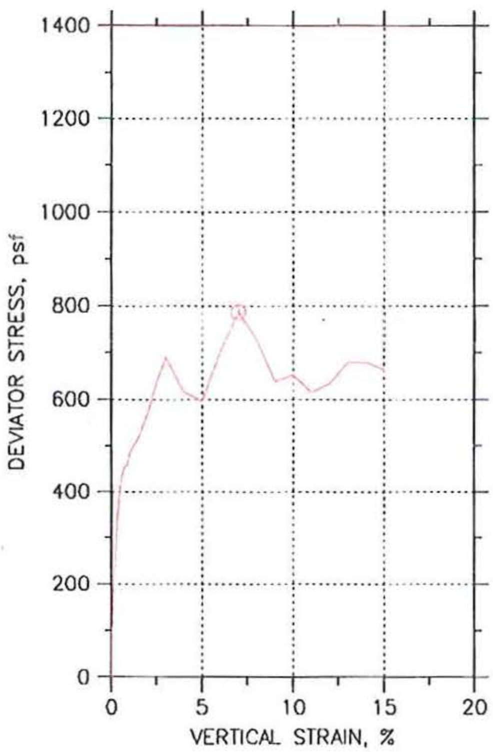
Symbol		ⓞ
Sample No.		P5
Test No.		U10-020
Depth		52.5-53
Initial	Diameter, in	2.375
	Height, in	5.96
	Water Content, %	32.0
	Dry Density, pcf	90.69
	Saturation, %	98.6
	Void Ratio	0.893
Before Shear	Water Content, %	
	Dry Density, pcf	
	Saturation*, %	
	Void Ratio	
	Back Press., psf	
Ver. Eff. Cons. Stress, psf		3848
Shear Strength, psf		1088
Strain at Failure, %		13
Strain Rate, %/min		1
B-Value		---
Implied Specific Gravity		2.75
Liquid Limit		---
Plastic Limit		---

Caltrans

Project: San Francisquito Creek Br	
Location: 04-SCL-101-52.6	
Project No.: 04-235620	
Boring No.: R-10-001	
Sample Type: ASTM D2850	
Description: Moist, Stiff, Greyish Tan, Clay with few Voids.	
Remarks:	MP 9/21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST





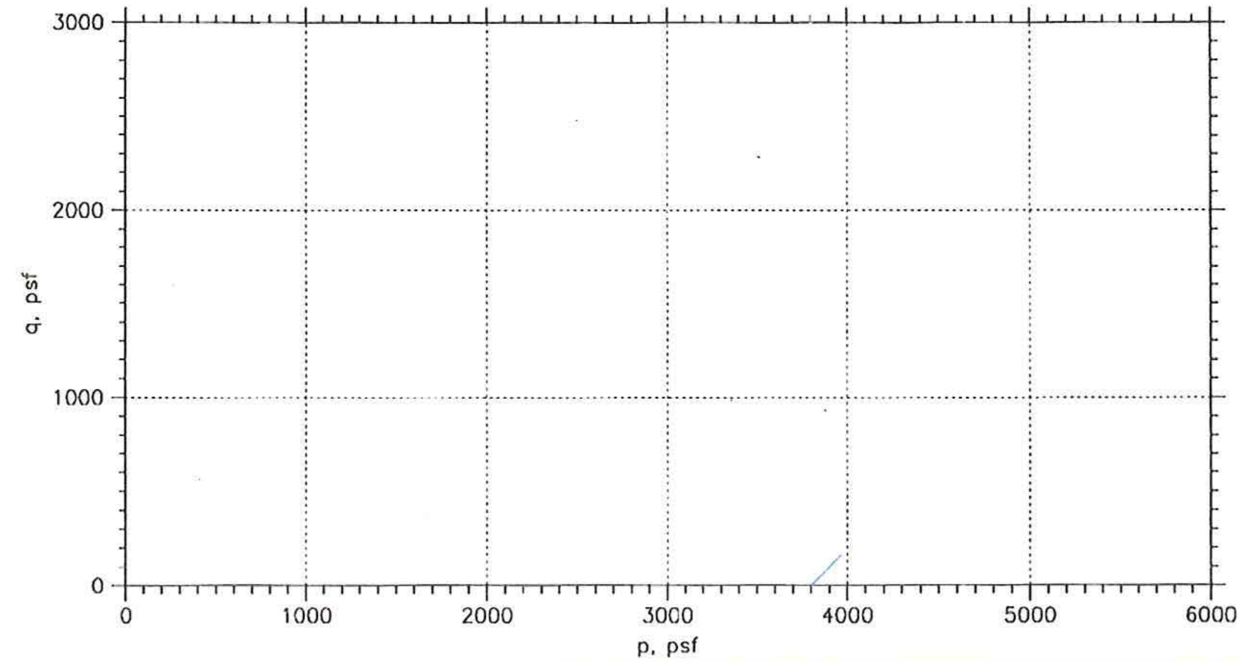
Symbol		⊙
Sample No.		09A
Test No.		U10-021
Depth		49-49.5
Initial	Diameter, in	1.94
	Height, in	3.83
	Water Content, %	34.4
	Dry Density, pcf	89.05
	Saturation, %	100.0
	Void Ratio	0.928
Before Shear	Water Content, %	
	Dry Density, pcf	
	Saturation*, %	
	Void Ratio	
	Back Press., psf	
Ver. Eff. Cons. Stress, psf		3599
Shear Strength, psf		392.9
Strain at Failure, %		7
Strain Rate, %/min		1
B-Value		---
Implied Specific Gravity		2.75
Liquid Limit		---
Plastic Limit		---

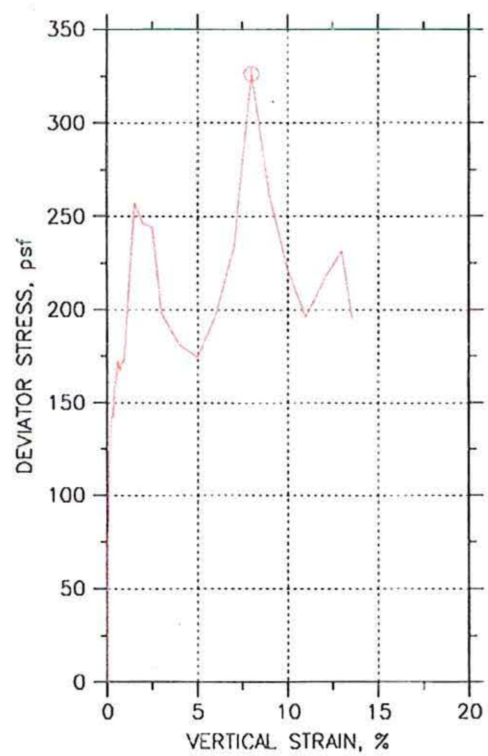
Caltrans

Project: San Francisquito Creek Br
Location: 04-SCL-101-52.6
Project No.: 04-235620
Boring No.: R-10-002
Sample Type: ASTM D2850
Description: Moist, Firm, Light Tan, Clay with few Voids.
Remarks:

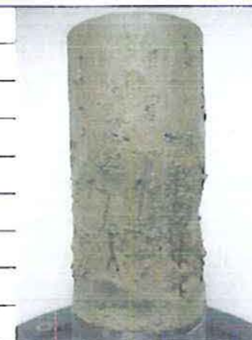
11/09/21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST





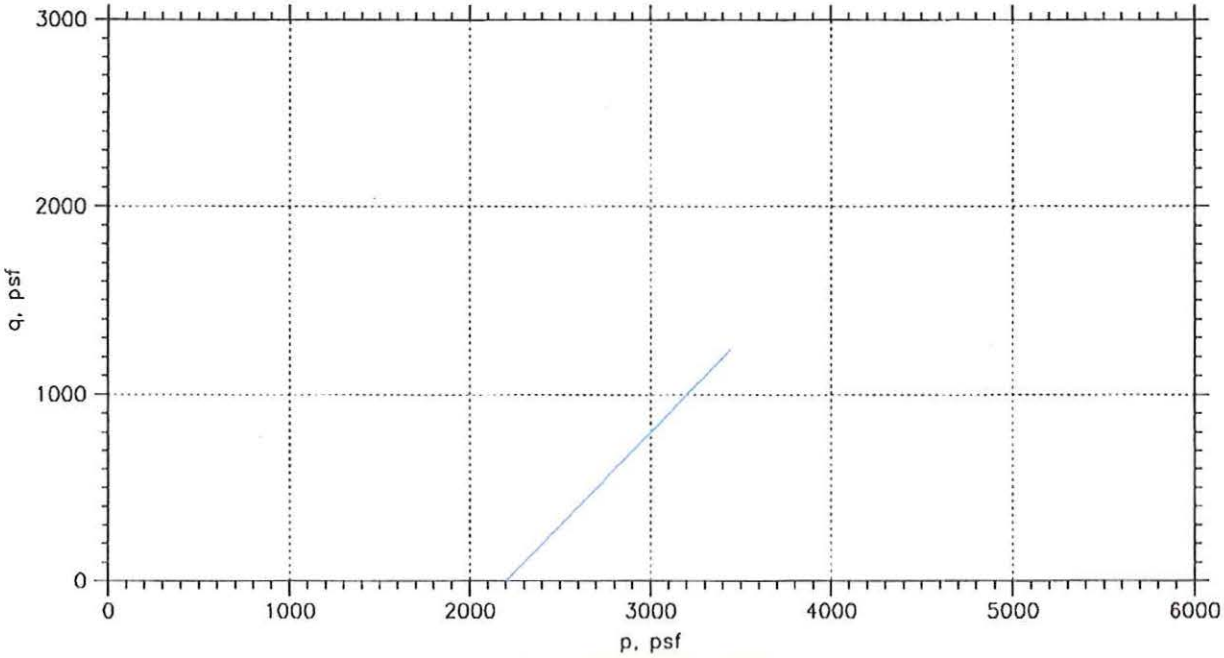
Symbol		⊙
Sample No.		10C
Test No.		U10-022
Depth		52-52.5
Initial	Diameter, in	1.9
	Height, in	3.75
	Water Content, %	38.3
	Dry Density, pcf	73.52
	Saturation, %	78.8
	Void Ratio	1.33
Before Shear	Water Content, %	
	Dry Density, pcf	
	Saturation*, %	
	Void Ratio	
	Back Press., psf	
Ver. Eff. Cons. Stress, psf		3801
Shear Strength, psf		163.1
Strain at Failure, %		8
Strain Rate, %/min		1
B-Value		---
Implied Specific Gravity		2.75
Liquid Limit		---
Plastic Limit		---

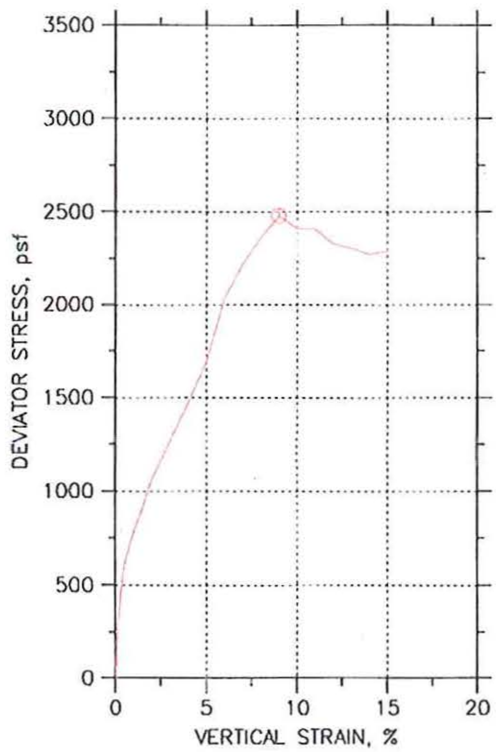


Caltrans

Project: San Francisquito Creek Br
Location: 04-SCL-101-52.6
Project No.: 04-235620
Boring No.: R-10-002
Sample Type: ASTM D2850
Description: Moist, Soft, Tan Clay with Voids
Remarks: JO 9/21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST



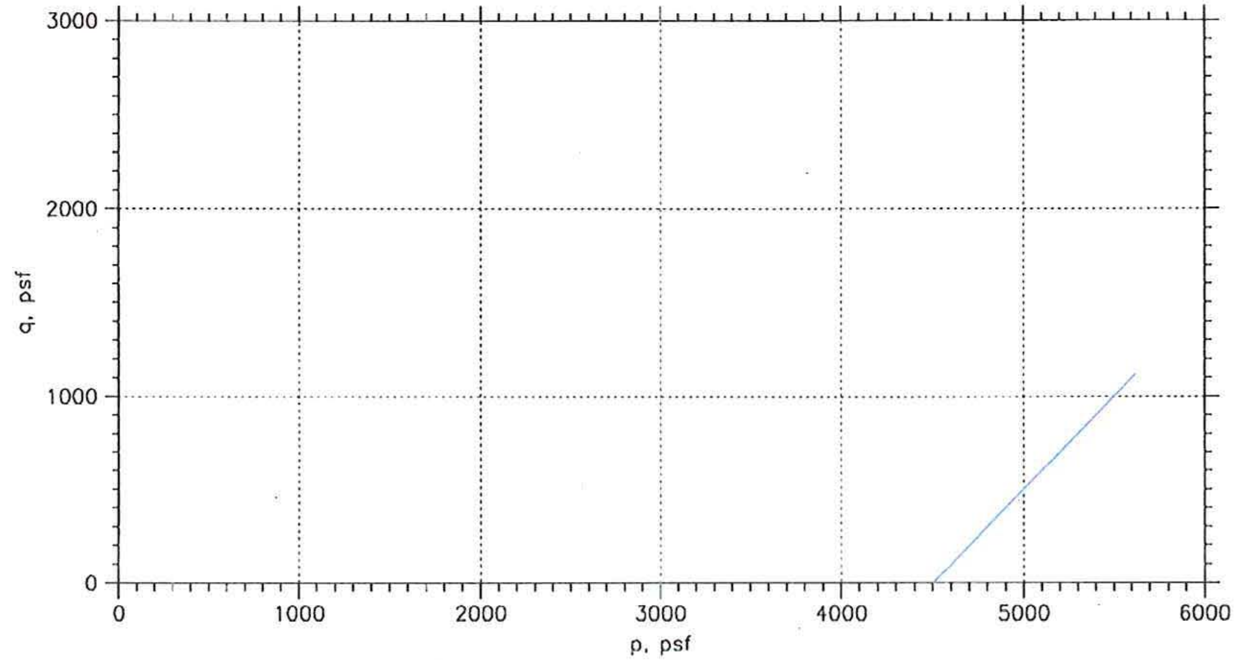


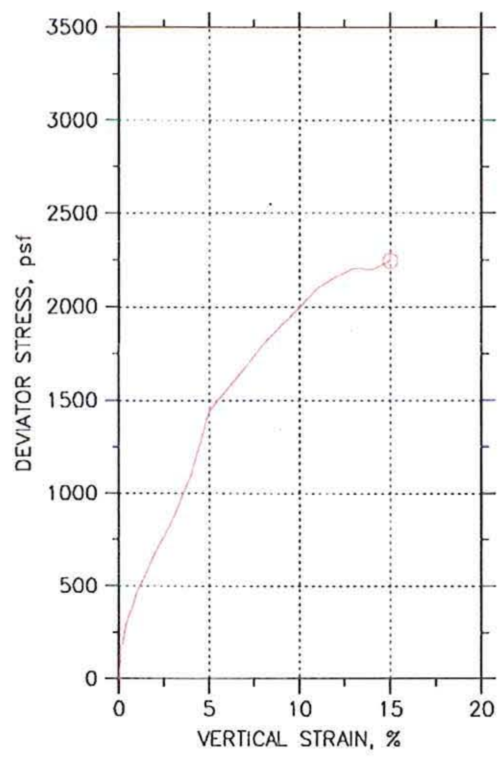
Symbol		ⓞ
Sample No.		4B
Test No.		U10-023
Depth		24-24.5
Initial	Diameter, in	1.94
	Height, in	3.76
	Water Content, %	53.3
	Dry Density, pcf	67.75
	Saturation, %	95.6
	Void Ratio	1.53
Before Shear	Water Content, %	
	Dry Density, pcf	
	Saturation*, %	
	Void Ratio	
	Back Press., psf	
Ver. Eff. Cons. Stress, psf		2200
Shear Strength, psf		1240
Strain at Failure, %		9
Strain Rate, %/min		1
B-Value		---
Implied Specific Gravity		2.75
Liquid Limit		---
Plastic Limit		---

Caltrans

Project: San Francisquito Creek Br
Location: 04-SCL-101-52.6
Project No.: 04-235620
Boring No.: R-10-00 .3
Sample Type: ASTM D2850
Description: Moist, Sitff, Grey Clay.
Remarks: 4/D < 2.0 no 9/21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST



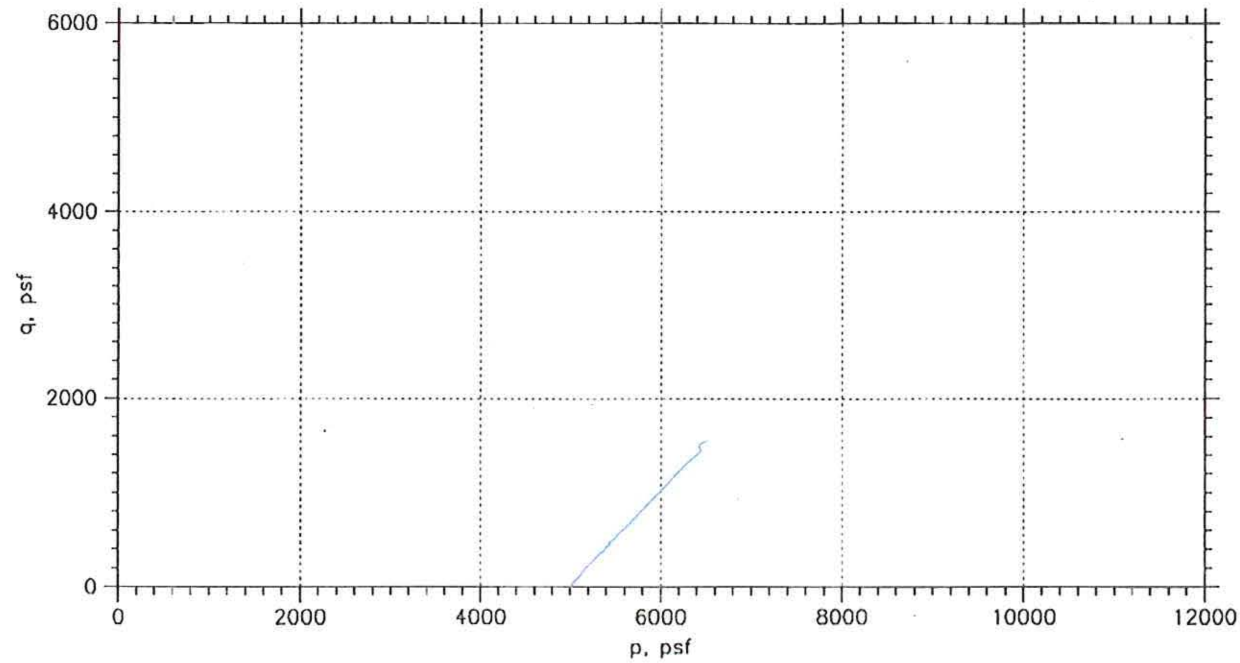


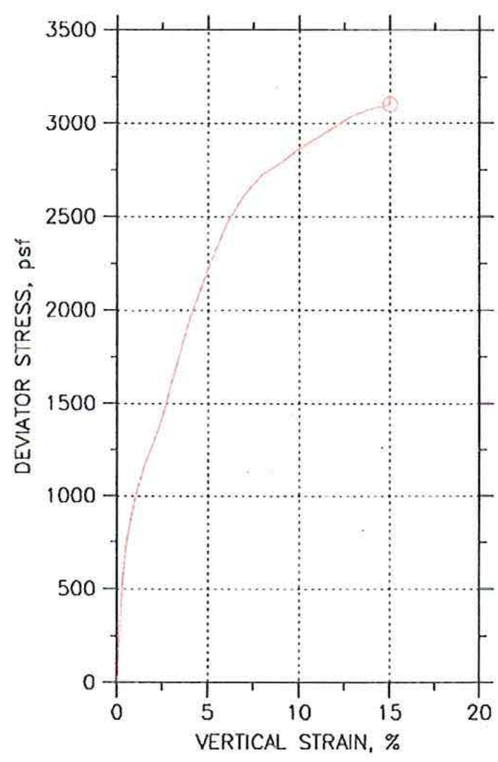
Symbol		ʘ
Sample No.		12A
Test No.		U10-024
Depth		64.5-65
Initial	Diameter, in	1.94
	Height, in	3.98
	Water Content, %	26.5
	Dry Density, pcf	94.53
	Saturation, %	89.3
	Void Ratio	0.816
Before Shear	Water Content, %	
	Dry Density, pcf	
	Saturation*, %	
	Void Ratio	
	Back Press., psf	
Ver. Eff. Cons. Stress, psf		4500
Shear Strength, psf		1123
Strain at Failure, %		15
Strain Rate, %/min		1
B-Value		---
Implied Specific Gravity		2.75
Liquid Limit		---
Plastic Limit		---

Caltrans

Project: San Francisquito Creek Br
Location: 04-SCL-101-52.6
Project No.: 04-235620
Boring No.: R-10-03
Sample Type: ASTM D2850
Description: Moist, Very Firm to Soft, Tan with Grey Clay, with Voids and a Hard Clod in Center
Remarks: JJO 9/21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST



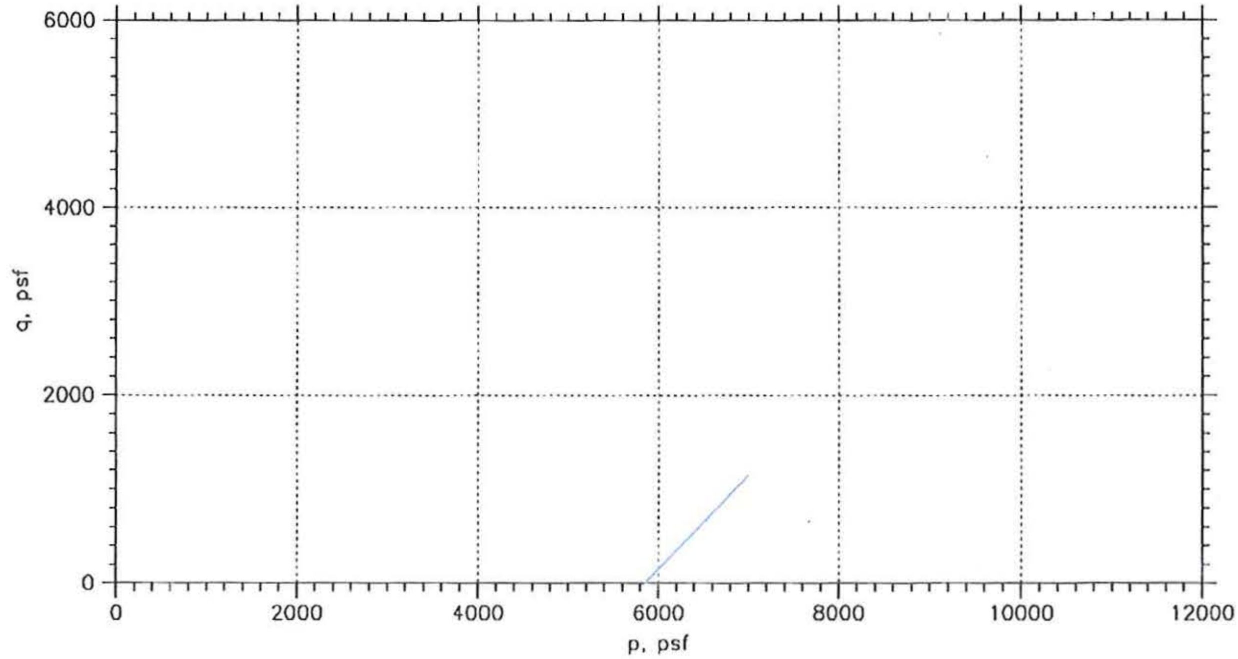


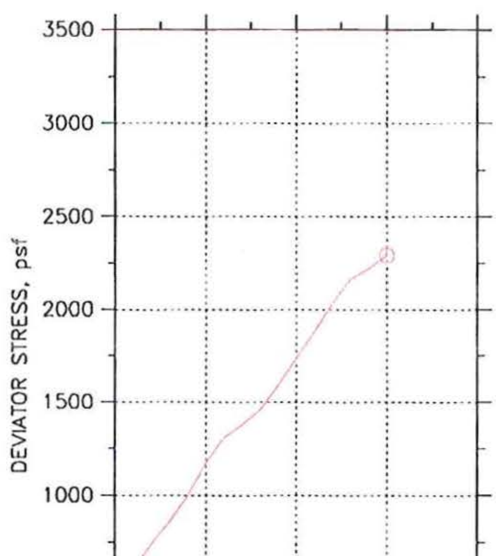
Symbol		⊙
Sample No.		14D
Test No.		U10-025
Depth		73-73.5
Initial	Diameter, in	1.94
	Height, in	3.9
	Water Content, %	24.4
	Dry Density, pcf	101.7
	Saturation, %	97.3
	Void Ratio	0.689
Before Shear	Water Content, %	
	Dry Density, pcf	
	Saturation*, %	
	Void Ratio	
	Back Press., psf	
Ver. Eff. Cons. Stress, psf		4997
Shear Strength, psf		1551
Strain at Failure, %		15
Strain Rate, %/min		1
B-Value		---
Implied Specific Gravity		2.75
Liquid Limit		---
Plastic Limit		---

Caltrans

Project: San Francisquito Creek Br
Location: 04-SCL-101-52.6
Project No.: 04-235620
Boring No.: R-10-003
Sample Type: ASTM D2850
Description: Moist, Stiff, Greenish Brownish Grey, Clay
Remarks: Chamber leak during testing. 10 9 21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST





Symbol		⊙
Sample No.		17D
Test No.		U10-026
Depth		88-88.5
Initial	Diameter, in	1.94
	Height, in	4
	Water Content, %	33.6
	Dry Density, pcf	88.54
	Saturation, %	98.5
	Void Ratio	0.939
Before Shear	Water Content, %	
	Dry Density, pcf	
	Saturation*, %	
	Void Ratio	
	Back Press., psf	
Ver. Eff. Cons. Stress, psf		5849
Shear Strength, psf		1146
Strain at Failure, %		15
Strain Rate, %/min		1
B-Value		---
Implied Specific Gravity		2.75
Liquid Limit		---
Plastic Limit		---

Caltrans

Project: San Francisquito Creek Br
Location: 04-SCL-101-52.6
Project No.: 04-235620
Boring No.: R-10-003
Sample Type: ASTM D2850
Description: Moist, Stiff, Grey, Clay.
Remarks:

NP 9/21

TEST NO. 6787 - 24P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ________ APPROVED BY ________

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ DIS. MAT L... ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS. L ☐ PAV'T. SE ☐ ACCOUNTI ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	100				
50	99				
100	92				
200	74				
5μ	26				
1μ	15				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 25.7%.

REMARKS:

SURFACE	
BASE	
SUBBASE	
GRAVEL EQUIVALENT FACTOR	
TRAFFIC INDEX	
R VALUE — EXUDATION PRESSURE	
R VALUE — EXPANSION PRESSURE	
R VALUE — AT EQUILIBRUM	SPEC.
INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)	

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (OVE ☐ BULK (SSD ☐ APPAREN
LL. 31 P.L 18 P.I. 13		FINE
CV		
S.E — AS REC'D.		AS REC'D.
S.E — CRUSHED		CRUSHED
S.E — COMBINED		REL. COMPACTION
LART — GRADE 100 REV.		IN PLACE
LART — 500 REV.		DENSITY
DUR — D_f		MOISTURE
DUR — D_c		% REL. COMP.
% CRUSHED PARTICLES		SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708249

AUG 16 2010

6787-24P

☐ PRELIMINARY TESTS
☑ ... TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE ...
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH ... ☐ DIST. ...

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-24P

... OR REQ. NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-001

DEPTH: 5-6.5

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK 140 R

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-001-S1 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/10/2010

BY: TUNG NGUYEN TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775. FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-25P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ TRANS. L
☐ DIS. MAT LS ENGR. ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNTI
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	100				
50	99				
100	94				
200	76				
5μ	25				
1μ	16				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 29.4%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC.

LL. 33 P.L. 18 P.I. 15

CV

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

FINE | C

AS REC'D.

CRUSHED

REL. COMPACTION

IN PLACE | OP

DENSITY

MOISTURE

% REL. COMP.

SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708250

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH ☐ DIST.

FIELD NO. ——

DIST. LAB NO. ~~7834~~ 6787-25P

REQ. NO.

6787-25P

AUG 16 2010

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-001

DEPTH 10-11.5

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S2 AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS

(MA) PARTICLE-SIZE ANALYSIS, PI
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

8/ 46243

TEST NO. 6787 – 26P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 07 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS ... R. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	98				
16	90				
30	66				
50	27				
100	18				
200	11				
5μ	8				
1μ	5				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture – 26.5%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED–ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE–GMS				
HEIGHT OF BRIQUETTE–INCHES				
DRY DENSITY OF BRIQ. – # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R–VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R–VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. P.L P.I.	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE	O...
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708251

AUG 16 2010

6787-26P

☐ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE
☐ ...
☐ SPECIAL ...

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB

SHIPMENT NO. / AUTHORIZATION

FIELD NO.

DIST. LAB NO. ~~7234~~ 6787-26P

P.O. / REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-001

DEPTH 15–16.5

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S3 AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS, (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUBOBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND CA 94612

CONTRACTOR

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE.

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-27P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR... ☐ TRANS. L...
☐ DIS. MAT LS. ☐ PAV'T. SE...
☐ RESIDENT ENGINEER ☐ ACCOUNTI...
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	99				
8	99				
16	98				
30	98				
50	98				
100	97				
200	84				
5μ	28				
1μ	16				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture - 37.6%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

	A	B	C	D
TEST SPECIMEN				
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 37 P.L. 23 P.I. 14	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN...) ☐ BULK (SSD) ☐ APPARENT

	FINE	CO...
AS REC'D.		
CRUSHED		

REL. COMPACTION D...

	IN PLACE	OPT...
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATI...

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708252

AUG 16 2010

6787-27P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ...
☐ INDEPENDENT...
☐ ASSURANCE...
☐ ...
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRA...
☑ DIS...

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-27P

...O. OR REQ. NO.

AUTHO... NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-001

DEPTH 20-21.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S4 AND IS ONE OF A GROUP OF ____ SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

140 lbs

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE ____ TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS (MA), PI, WATER CONTENT.

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 40743

TEST NO. 6787 - 28P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT L. ENGR. ☐ PAV'T. S.
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. ☐ LIMITS SOUGHT ☐
3					
2½					
2					
1½					
1	100				
¾	96				
½	95				
⅜	94				
4	90				
8	86				
16	81				
30	75				
50	68				
100	59				
200	50				
5μ	24				
1μ	15				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 35.8%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE	
EXUDATION PRESSURE	
EXPANSION PRESSURE	
AT EQUILIBRUM	SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
L.L. 38 P.L. 22 P.I. 16	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	C
AS REC'D.		
CRUSHED		

REL. COMPACTION D

	IN PLACE	OPT
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

AUG 16 2010

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708253

☐ PRELIMINARY TESTS
☑ PROJECT TESTS
☐ ACCEPTANCE TESTS
☐ REFERENCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

LAB NO. ~~7934~~ 6787-28P

6787-28P

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-001

DEPTH 25-26.5

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S5 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS
PARTICLE-SIZE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 - 29P
BILLED

DATE RECEIVED AUG 16 2010
CALC. BY ______ APPROVED BY ______
DATE REPORTED FEB 07 2011

☐ DISTRICT DIR ☐ TRANS.
☐ DIS. MAT LS. ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:
% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 27.5%

REMARKS:

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX
R VALUE: EXUDATION PRESSURE
EXPANSION PRESSURE
AT EQUILIBRUM SPEC.
INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC.
LL. 35 P.L. 18 P.I. 17
CV
S.E: AS REC'D. / CRUSHED / COMBINED
LART: GRADE 100 REV. / 500 REV.
DUR: D_f / D_c
% CRUSHED PARTICLES

SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE
FINE
AS REC'D.
CRUSHED
REL. COMPACTION
IN PLACE
DENSITY
MOISTURE
% REL. COMP.
SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100
EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)
CARD NUMBER C708254

AUG 16 2010

6787-29P

☐ PRELIMINARY TESTS
☑ PR... TESTS
☐ ACCEPTANCE TESTS
☐ DEPENDENT ASSURANCE
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH ☑ DIST. LAB
SHIPMENT
AUTHORIZATION NO.

FIELD NO.
DIST. LAB NO. ~~7934~~ 6787-29P
... OR REQ. NO.

SAMPLE OF: SOIL
FOR USE IN: BRIDGE FOUNDATION DESIGN
SAMPLE FROM: BORING R-10-001
DEPTH: 30-31.5'
LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.
THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-001 S6
AND IS ONE OF A GROUP OF
SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)
OWNER OR MANUFACTURER: CALTRANS
TOTAL QUANTITY AVAILABLE
TEST RESULTS DESIRED: ☑ NORMAL ☐ PRIORITY
DATE NEEDED: 09/24/10
REMARKS: PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER
DATE SAMPLED: 08/10/2010
BY: TUNG NGUYEN TITLE: T.E. (CIVIL)
DIST, CO, RTE, PM: 04-SM-101-0.0
LIMITS
CONT. NO. 235620 Project 0400000678
FED. NO. SUB OBJECT 160
RES. ENGR. OR SUPT. TUNG NGUYEN
ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND
CONTRACTOR CA94612
PHONE: 510-622-1775 . FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

TEST NO. 6787-30P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR... ☐ DIS. MAT LS ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS. ☐ PAV'T. S ☐ ACCOUNT ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1	100				
¾	95				
½	92				
⅜	88				
4	72				
8	59				
16	48				
30	35				
50	21				
100	15				
200	12				
5μ	8				
1μ	6				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 20.8%

REMARKS:

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE CHARGE EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) ACTIVITY OR OBJECT AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS			SPEC.
LL.	P.L	P.I.	
CV			
S.E	AS REC'D		
	CRUSHED		
	COMBINED		
LART	GRADE	100 REV.	
		500 REV.	
DUR	D_f		
	D_c		
% CRUSHED PARTICLES			

SP. GR. ☐ BULK (OV ☐ BULK (SSD ☐ APPAREN

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE
DENSITY	
MOISTURE	
% REL. COMP.	
SPEC.	

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708255

AUG 16 2010

6787-30P

☐ PRELIMINARY TESTS

SAMPLE SENT TO: ☐ HDQTRS LAB ☐ BR... LAB ☑ DIST.

FIELD NO.

DIST. LAB NO. ~~7734~~ 6787-30P

OR REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-002

DEPTH 35-36.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

140

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-57

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS, (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

TEST NO. 6787 - 31P

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

BILLED

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS R. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	99				
16	98				
30	98				
50	97				
100	96				
200	91				
5µ	50				
1µ	31				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 29.9%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL 43 P.L 19 P.I. 24	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT — FINE; AS REC'D.; CRUSHED

REL. COMPACTION: IN PLACE / OP — DENSITY; MOISTURE; % REL. COMP.; SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708256

6787-31P

AUG 16 2010

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE
☐ DISPUTE
☐ TRANS.
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-31P

CONT. OR REQ. NO.

AUTHORIZATION NO.

SAMPLE OF Soil

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-001

DEPTH 45-46.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001 S9

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS (MA) PARTICLE-SIZE ANALYSIS, PI
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

TO

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46243

TEST NO. 6787 - 32P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 07 2011

☐ DISTRICT DIR...R ☐ TRANS. L
☐ DIS. MAT LS. ...R. ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 33.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 44 P.L 22 P.I. 22	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVE ☐ BULK (SSD ☐ APPAREN

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE	OP
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708257

6787-32P

AUG 16 2010

☐ PRELIMINARY TESTS
☑ PROCESS...
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS ... DIST ... TRA ... SPECIAL TESTS

SAMPLE SENT TO: HDQTRS ... BRANCH LAB ... DIST. LAB ... SHIPMENT NO. ... AUTHORIZATION NO.

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-32P

REQ. NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-001

DEPTH: 50-51.5' 140'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-001 S10

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED: ☑ NORMAL ☐ PRIORITY

DATE NEEDED: 09/24/10

REMARKS: PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/10/2010

BY: TUNG NGUYEN TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROject 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 - 33P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS R. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1	100				
¾	99				
½	96				
⅜	95				
4	90				
8	83				
16	77				
30	66				
50	41				
100	24				
200	17				
5μ	9				
1μ	6				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 20.0%.

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OV) ☐ BULK (SS) ☐ APPARENT

LL. P.L P.I.

CV

S.E: AS REC'D. / CRUSHED / COMBINED

L.A.R.T: GRADE / 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

FINE: AS REC'D. / CRUSHED

REL. COMPACTION: IN PLACE / DENSITY / MOISTURE / % REL. COMP. / SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708258

AUG 16 2010

6787-33P

☐ PRELIMINARY TESTS ☐ ACCEPTANCE TESTS ☐ SPECIAL TESTS

SAMPLE SENT TO:

FIELD NO.

DIST. LAB NO. ~~7734~~

LOT NO. 6787-33P

P.O. OR REQ. NO.

SHIPMENT NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-001

DEPTH: 55-56.5

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK (40')

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-001 S11

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED: ☑ NORMAL ☐ PRIORITY

DATE NEEDED: 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS (WA) WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/ /2010

BY: TUNG NGUYEN TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

10

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46243

TEST NO. 6787 - 34P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR... ☐ TRANS. ...
☐ DIS. MAT L ... R. ☐ PAV'T. S...
☐ RESIDENT ENGINEER ☐ ACCOUNT...
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½	100				
⅜	98				
4	96				
8	92				
16	87				
30	82				
50	71				
100	55				
200	42				
5μ	20				
1μ	10				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 18.5%

REMARKS:

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 22 P.L 14 P.I. 8	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVE...) ☐ BULK (SSD) ☐ APPAREN...

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE	O...
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTAT...

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708259

AUG 16 2010

6787-34P

☐ PRELIMINARY TESTS
☑ P... TESTS
☐ ACCEPT...
☐ INDEPEN...
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS LAB ☐ BR... LAB ☑ DIST.

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-34P

SHIPMENT NO.

P.O. OR REQ. NO.

AUTHO... NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-001 140'

DEPTH 60-61.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S12 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 . FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-35P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR ☐ TRANS.
☐ DIS. MAT LS ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	98				
16	96				
30	95				
50	94				
100	92				
200	86				
5μ	44				
1μ	28				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture - 30.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 38 P.L. 20 P.I. 18	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART 500 REV.	
DUR D_F	
DUR D_C	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPAREN

FINE

AS REC'D.

CRUSHED

REL. COMPACTION

IN PLACE

DENSITY

MOISTURE

% REL. COMP.

SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708260

AUG 16 2010

6787-35P

☐ PRELIMINARY TESTS
☑ [illegible] TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ DIST.
☐ TRANS.
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-35P

REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-001

DEPTH 65-66.5

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

140'

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S13

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS (MA) PARTICLE-SIZE ANALYSIS, PI
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

87 46943

TEST NO.	DATE RECEIVED	
6787 - 36P	AUG 16 2010	☐ DISTRICT DIRECTOR ☐ TRANS.
	CALC. BY ____ APPROVED BY ____	☐ DIS. MAT ... R. ☐ PAV'T. S
BILLED	DATE REPORTED JAN 21 2011	☐ RESIDENT ENGINEER ☐ ACCOUNT
		☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	100				
50	100				
100	99				
200	96				
5μ	55				
1μ	33				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT.	% BY VOL.	TEST NO.	DESCRIPTION

% Moisture - 33.4%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE	
EXUDATION PRESSURE	
EXPANSION PRESSURE	
AT EQUILIBRUM	SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS			SPEC.
LL 39 P.L 20 P.I. 19			
CV			
S.E	AS REC'D.		
	CRUSHED		
	COMBINED		
LART	GRADE	100 REV.	
		500 REV.	
DUR	D_f		
	D_c		
% CRUSHED PARTICLES			

SP. GR.	☐ BULK (OVE ☐ BULK (SSD ☐ APPAREN
	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION	IN PLACE	O
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708261

6787-36P

AUG 16 2010

☐ PRELIMINARY TESTS	SAMPLE SENT TO:	FIELD NO.
☑ ... TESTS	☐ HDQTRS. LAB	DIST. LAB NO. ~~7334~~
☐ ACCEPTANCE TESTS	☐ BRANCH LAB	... -36P
☐ INDEPENDENT ASSURANCE	☐ DIST. LAB	... OR REQ. NO.
☐ ...	... NT NO.	
☐ ...	AUTHORIZ...	
SPECIAL TESTS		

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-001

DEPTH 70-71.5 140 ft

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S14	AND IS ONE OF A GROUP OF	SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE	TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY	DATE NEEDED 09/24/10

REMARKS

PARTICLE SIZE ANALYSIS (MA), P.I., WATER CONTENT.

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/11/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

SUB OBJECT 160

FED. NO.

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775. FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 4043

TEST NO. 6787 - 37P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR R ☐ TRAN
☐ DIS. MAT L R. ☐ PAV
☐ RESIDENT ENGINEER ☐ ACCO
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	100				
50	100				
100	98				
200	90				
5μ	49				
1μ	34				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture - 23.9%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 35 P.L. 17 P.I. 18	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_F	
DUR D_C	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK ☐ BULK ☐ APPAR — FINE; AS REC'D.; CRUSHED

REL. COMPACTION — IN PLACE; DENSITY; MOISTURE; % REL. COMP.; SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708262

AUG 16 2010

6787-37P

☐ PRELIMINARY TESTS ☐ ACCEPTANCE TESTS

SAMPLE SENT TO: ☐ HDQTRS ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. NO. ~~7954~~

P.O. OR REQ. NO.

SHIPMENT NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-001

DEPTH 75-76.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR. 140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S15 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS (MA) PARTICLE-SIZE ANALYSIS, PI
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/11/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 . 38P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ DIS. MAT L ENGR. ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS ☐ PAV'T ☐ ACCOU ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	99				
50	98				
100	97				
200	91				
5µ	36				
1µ	24				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 29.2%

REMARKS ✱ NOT ENOUGH TO RUN CTM-204 (PLASTICITY INDEX)

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. ✱ | SP. GR. ☐ BULK (O ☐ BULK (S ☐ APPARE

LL. | P.L | P.I. | FINE

CV

S.E: AS REC'D. / CRUSHED / COMBINED | AS REC'D. / CRUSHED

LART: GRADE 100 REV. / 500 REV.

REL. COMPACTION: IN PLACE / DENSITY / MOISTURE / % REL. COMP.

DUR: D_f / D_c

% CRUSHED PARTICLES | SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708263

AUG 16 2010

6787-38P

☐ PRELIMINARY TESTS ☑ [illegible] ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQ LAB ☐ [illegible] ☑ DIST

FIELD NO.

LAB NO. ~~7934~~ 6787-38P

SHIPMENT NO.

P.O. OR REQ. NO.

AUTHORIZATION

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-001

DEPTH 85-86.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S16

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE SIZE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/11/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

-TL-361 (Rev.10/78)

TEST NO. 6787-39P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT. ENGR. ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	99				
50	96				
100	78				
200	55				
5μ	26				
1μ	17				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 27.4%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC.

LL 23 P.L. 17 P.I. 6

CV

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

SP. GR. ☐ BULK (OVEN DRY) ☐ BULK (SSD) ☐ APPARENT — FINE — AS REC'D. — CRUSHED

REL. COMPACTION: IN PLACE — DENSITY — MOISTURE — % REL. COMP. — SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708264

6787-39P

AUG 16 2010

☐ PRELIMINARY TESTS ☐ PROCESS TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS LAB ☐ BRANCH LAB ☑ DIST. LAB

FIELD NO.

DIST. LAB NO. 6787-39P

SHIPMENT NO.

REQ. NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-001

DEPTH 90-91.5 140 ft

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001-S17

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS (1A) PARTICLE-SIZE ANALYSIS, PI
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/11/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM
04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

TEST NO. 6787-40p

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR... OR ☐ TRANS.
☐ DIS. MAT L... R. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	99				
8	96				
16	92				
30	87				
50	73				
100	49				
200	33				
5μ	18				
1μ	12				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 23.2%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

LL. P.L P.I.

CV

S.E: AS REC'D.; CRUSHED; COMBINED

LART: GRADE 100 REV.; 500 REV.

DUR: D_f; D_c

% CRUSHED PARTICLES

FINE; AS REC'D.; CRUSHED

REL. COMPACTION: IN PLACE; DENSITY; MOISTURE; % REL. COMP.; SPEC.

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708265

AUG 16 2010

6787-40p

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE
☐ DISTRICT LAB
☐ TRANS LAB
☐ FINAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 40p

AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-001

DEPTH: 95-96.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK

140 ft

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-001 S18

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/11/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

87 46243

TEST NO. 6787-41P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ TRANS. L
☐ DIS. MAT LS ... R. ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNTI
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	100				
50	100				
100	100				
200	98				
5μ	63				
1μ	40				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 28.6%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 48 P.L 22 P.I. 26	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OV ☐ BULK (SSD ☐ APPAREN | FINE
AS REC'D.
CRUSHED

REL. COMPACTION: IN PLACE | DENSITY | MOISTURE | % REL. COMP. | SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

AUG 16 2010

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708266

☐ PRELIMINARY TESTS
☑ PROJECT TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE
☐ D
☐ T
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☑ DIST. LAB

SHIPMENT

AUTHORIZATION NO.

FIELD NO.

DIST. LAB NO. 7934

LOT NO. 6787-41P

P.O. OR REQ. NO.

6787-41P

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-001

DEPTH: 100-101.5

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR. 140°

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-001-S19

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: PARTICLE SIZE ANALYSIS (MA), PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/11/2010

BY: TUNG NGUYEN TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160 PHASE: (0)

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-42P

DATE RECEIVED AUG 16 2010

CALC. BY ___ APPROVED BY ___

DATE REPORTED FEB 07 2011

BILLED

☐ DISTRICT DIR... OR ☐ TRANS.
☐ DIS. MAT LS... GR. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	99				
30	99				
50	98				
100	93				
200	84				
5μ	56				
1μ	38				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture - 24.4%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 43 P.L 17 P.I. 26	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVE ☐ BULK (SSD ☐ APPAREN

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE	OP
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708267

6787-42P

AUG 16 2010

☐ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS.
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS LAB
☐ BRANCH LAB
☑ DIST. LAB

SHIPMENT NO.

AUTHORIZATION NO.

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-42P

P.O. OR REQ. NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-001

DEPTH: 105-106.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK

140.0'

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-001 - S20

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: (MA) PARTICLE-SIZE ANALYSIS, PI WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/11/2010

BY: TUNG NGUYEN TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUBOBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS: 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR: CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-4P

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 17 2010

BILLED

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS R. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	99				
30	94				
50	95				
100	88				
200	71				
5μ	26				
1μ	11				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 16.6%

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

REMARKS:

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT
LL. 29 P.L 17 P.I. 12		FINE
CV		

S.E.	AS REC'D.		AS REC'D.
	CRUSHED		CRUSHED
	COMBINED		REL. COMPACTION

LART	GRADE	100 REV.		IN PLACE
		500 REV.	DENSITY	
DUR	D_f		MOISTURE	
	D_c		% REL. COMP.	
% CRUSHED PARTICLES			SPEC.	

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET).

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708229

6787-4P

AUG 16 2010

☐ PRELIMINARY TESTS
☑ PROJECT TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB ☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB

SHIPMENT NO.

AUTHORIZATION NO.

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-4P

P.O. OR REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-002

DEPTH 5-6.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR. 140

THIS SAMPLE R-10-002-S1 IS SHIPPED IN (NO. CONTAINERS) | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS (MA), P.I, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

TEST NO. 6787-5P

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 17 2010

BILLED

☐ DISTRICT DIRECTOR ☐ DIS. MAT LS. ☐ RESIDENT ENGINEER ☐ CONSTRUCTION

☐ TRANS. L ☐ PAV'T. SE ☐ ACCOUNTI ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	99				
50	92				
100	62				
200	37				
5μ	13				
1μ	7				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 20.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRIUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. P.L P.I.	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVE ☐ BULK (SSD ☐ APPAREN

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE	O
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708230

6787-5P

AUG 16 2010

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH ☑ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-5P

SHIPMENT NO. | P.O. OR REQ. NO.

AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-002

DEPTH: 10-11.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK Br.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002-S2 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS (HA) WATER CONTENT

110°F

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/10/2010

BY: RIFAAT NASHED | TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUBOBJECT 160

RES. ENGR. OR SUPT. TUNE NGUYEN

ADDRESS: 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR: CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

TEST NO. 6787 - 6P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED DEC 17 2010

☐ DISTRICT DIR ... OR ☐ TRANS. ...
☐ DIS. MAT LS ... R. ☐ PAV'T. S...
☐ RESIDENT ENGINEER ☐ ACCOUNT...
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	97				
8	94				
16	92				
30	87				
50	52				
100	30				
200	20				
5μ	10				
1μ	5				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 24.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRIUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

LL. P.L P.I.

CV

S.E: AS REC'D. / CRUSHED / COMBINED — FINE / C...: AS REC'D. / CRUSHED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

REL. COMPACTION D...: IN PLACE | OP... — DENSITY / MOISTURE / % REL. COMP. / SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

87 46943

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708231

AUG 16 2010

6787-6P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ CONTROL TESTS
INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-6P

... OR REQ. NO.

AUTHORIZATION

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-002

DEPTH: 15-16.5

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK

40°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002-S3

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS (MA), WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/10/2010

BY: RIFAAT NASHED TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 . FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

TEST NO. 6787 7P	DATE RECEIVED AUG 16 2010	DISTRICT DIRECTOR / DIS. MAT LAB / RESIDENT ENGINEER / CONSTRUCTION	TRANS. / PAV'T. / ACCOUNT
BILLED	CALC. BY ____ APPROVED BY ____ DATE REPORTED DEC 17 2010		

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	96				
16	94				
30	91				
50	88				
100	85				
200	80				
5μ	35				
1μ	16				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 68.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 54 P.L 29 P.I. 25	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. BULK (OV) / BULK (SSD) / APPARENT — FINE — AS REC'D. / CRUSHED

REL. COMPACTION — IN PLACE — DENSITY / MOISTURE / % REL. COMP. / SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

AUG 16 2010

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708232

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☑ DIST. LAB

SHIPMENT NO.

AUTHORIZATION NO.

FIELD NO. ——

DIST. LAB NO. ~~7934~~ 6787-7P

P.O. OR REQ. NO.

6787-7P

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-002

DEPTH: 20-21.5'

140 pcf

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002-S4

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS (MA), PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/10/2010

BY: RIFAAT NASHED TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND CA94612

CONTRACTOR

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 . 8P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ________ APPROVED BY ________

DATE REPORTED DEC 17 2010

☐ DISTRICT DIRECTOR ☐ DIS. MAT LS ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS. L ☐ PAV'T. SE ☐ ACCOUNTI ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾	100				
½	98				
⅜	95				
4	91				
8	87				
16	81				
30	73				
50	58				
100	41				
200	29				
5μ	14				
1μ	7				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 26.4%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRIUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. P.L P.I.	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	CO
AS REC'D.		
CRUSHED		

REL. COMPACTION D

	IN PLACE	OPT
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

AUG 16 2010

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)
CARD NUMBER C708233

6787-8P

☐ PRELIMINARY TESTS ☑ SOURCE TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ DIST. LAB ☐ TRANS. LAB ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7973~~

LOT NO. 6787-8P

SHIPMENT NO. / OR REQ. NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-002

DEPTH 25-26.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

140 ft

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-S5 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/ /2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev. 10/78)

TEST NO. 6787-9P

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 17 2010

BILLED

☐ DISTRICT DIR. OR ☐ DIS. MAT LS R. ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS. L ☐ PAV'T. SE ☐ ACCOUNTI ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1	100				
¾	90				
½	80				
⅜	71				
4	53				
8	37				
16	26				
30	22				
50	19				
100	15				
200	12				
5μ	6				
1μ	3				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 14.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. P.L P.I.	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
CART GRADE 100 REV.	
CART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT — FINE / CO. — AS REC'D. — CRUSHED

REL. COMPACTION D — IN PLACE / OPT — DENSITY — MOISTURE — % REL. COMP. — SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708234

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. L
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☑ DIST. LAB

FIELD NO. ——

DIST. LAB NO. ~~7934~~

LOT NO. 6787-9P

SHIPMENT NO.

P.O. OR REQ. NO.

AUTHORIZATION NO.

6787-9P

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-002

DEPTH 30-31.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK Br.

140'

AUG 16 2010

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-S6

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS, (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46943

TEST NO. 6787 . 10P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED DEC 17 2010

☐ DISTRICT DIR OR ☐ DIS. MAT L GR. ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS. L. ☐ PAV'T. SE ☐ ACCOUNTI ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1	100				
¾	97				
½	91				
⅜	84				
4	66				
8	49				
16	38				
30	29				
50	22				
100	16				
200	12				
5μ	6				
1μ	4				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 17.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS		SPEC.
LL. P.L P.I.		
CV		
S.E	AS REC'D.	
	CRUSHED	
	COMBINED	
LART	GRADE 100 REV.	
	500 REV.	
DUR	D_f	
	D_c	
% CRUSHED PARTICLES		

SP. GR. ☐ BULK (OVEN ☐ BULK (SSD) ☐ APPARENT

	FINE	CO
AS REC'D.		
CRUSHED		

REL. COMPACTION DA

	IN PLACE	OPTI
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTAT

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708235

6787-10P

AUG 16 2010

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ DIST LAB
☐ TRANS LAB
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7734~~ 6787-10P

LAB OR REQ. NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-002

DEPTH 35-36.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

140 %

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002 S7 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS
PARTICLE-SIZE ANALYSIS (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM
04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-11P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 17 2010

☐ DISTRICT DIR ☐ DIS. MAT L ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS. ☐ PAV'T. S ☐ ACCOUNT ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1	100				
¾	94				
½	93				
⅜	89				
4	75				
8	52				
16	45				
30	34				
50	22				
100	19				
200	16				
5µ	7				
1µ	4				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 18.8%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRIUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

LL. P.L P.I.

CV | FINE

AS REC'D. | CRUSHED

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

REL. COMPACTION | IN PLACE

DENSITY / MOISTURE / % REL. COMP. / SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708236

AUG 16 2010

6787-11P

☐ PRELIMINARY TESTS ☑ PROCESS TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE ☐ DIST ☐ TRANS ☐ ... TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-11P

... OR REQ. NO.

... AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-002

DEPTH: 40-41.5' 140'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002-S8 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS, (MA) WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/10/2010

BY: RIFAAT NASHED | TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

87 46243

TEST NO. 6787 C 12P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR ... OR ☐ TRANS.
☐ DIS. MAT LS ... R. ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUN
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	99				
8	98				
16	98				
30	98				
50	97				
100	97				
200	94				
5µ	53				
1µ	39				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 34.5%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

-TL-361 (Rev.10/78)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

L.L. 53 P.L. 20 P.I. 33

CV

FINE

S.E.: AS REC'D.; CRUSHED; COMBINED

AS REC'D.

CRUSHED

LART: GRADE 100 REV.; 500 REV.

DUR: D_f; D_c

% CRUSHED PARTICLES

REL. COMPACTION: IN PLACE; DENSITY; MOISTURE; % REL. COMP.; SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATIO

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708237

AUG 16 2010

6787-12P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ A... TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-12P

... REQ. NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-002

DEPTH 45-46.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

140'

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-S9

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE SIZE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

87 46743

TEST NO. 6787 – 13P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED DEC 17 2010

☐ DISTRICT DIRECTOR ☐ TRANS. L
☐ DIS. MAT LS. ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 27.8%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED–ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE–GMS				
HEIGHT OF BRIQUETTE–INCHES				
DRY DENSITY OF BRIQ. – # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R–VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R – VALUE BY EXPANSION				

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (OVEN DRY) ☐ BULK (SSD) ☐ APPARENT	
LL. 38 P.L. 17 P.I. 21			FINE
CV		AS REC'D.	
S.E. AS REC'D.		CRUSHED	
S.E. CRUSHED		REL. COMPACTION	
S.E. COMBINED			IN PLACE
CART GRADE 100 REV.			
CART GRADE 500 REV.		DENSITY	
DUR D_f		MOISTURE	
DUR D_c		% REL. COMP.	
% CRUSHED PARTICLES		SPEC.	

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708238

6787-13p

AUG 16 2010

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☑ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-13P

AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-002

DEPTH: 50 – 51.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK 140 ±

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002-S10 AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 - 14P

BILLED

DATE RECEIVED AUG 16 2010
CALC. BY ____ APPROVED BY ____
DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ TRANS. ☐ DIS. MAT L. ENGR. ☐ PAV'T. S ☐ RESIDENT ENGINEER ☐ ACCOUNT ☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1	100				
¾	99				
½	96				
⅜	94				
4	84				
8	71				
16	56				
30	41				
50	20				
100	7				
200	6				
5µ	5				
1µ	4				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 21.8%

REMARKS:

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX

R VALUE
EXUDATION PRESSURE
EXPANSION PRESSURE
AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

LL. P.L P.I.
CV

FINE
AS REC'D.
CRUSHED

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

REL. COMPACTION: IN PLACE
DENSITY
MOISTURE
% REL. COMP.
SPEC.

DUR: D_f / D_c

% CRUSHED PARTICLES

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708239

AUG 16 2010

6787-14P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☐ DIST. LAB

SHIPMENT NO.
AUTHORIZATION NO.

FIELD NO.
DIST. LAB NO. ~~7734~~ 6787-14P
REQ. NO.

SAMPLE OF Soil
FOR USE IN BRIDGE FOUNDATION DESIGN
SAMPLE FROM R-10-002 #40
DEPTH 55-56.5'
LOCATION OF SOURCE SAN FRANCISQUITO CREEK
THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-S11 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)
OWNER OR MANUFACTURER CALTRANS
TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10
REMARKS
PARTICLE-SIZE ANALYSIS, (HA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER
DATE SAMPLED 08/10/2010
BY RIFAAT NASHED TITLE T.E. (CIVIL)
DIST, CO, RTE, PM
04-SM-101-0.0
LIMITS
CONT. NO. 235620 PROJECT 0400000678
FED. NO. SUBOBJECT 160
RES. ENGR. OR SUPT. TUNG NGUYEN
ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND
CONTRACTOR CA94612
PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100
EXUDATION PRESSURE (PSI)

87 46243

TEST NO. 6787 - 15P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT L. ENGR. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. ☐ LIMITS SOUGHT ☐
3					
2½					
2					
1½					
1					
¾	100				
½	99				
⅜	97				
4	90				
8	84				
16	79				
30	74				
50	64				
100	48				
200	36				
5µ	17				
1µ	11				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 20.1%

REMARKS: UNABLE TO RUN CTM 204 BECAUSE MATERIAL IS SANDY NON-PLASTIC.

SURFACE
BASE
SUBBASE

GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC.

LL. N/P P.L. N/P P.I. N/P

CV

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE — FINE
AS REC'D. / CRUSHED

REL. COMPACTION — IN PLACE
DENSITY / MOISTURE / % REL. COMP. / SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708240

6787-15P

AUG 16 2010

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB

FIELD NO.
DIST. LAB NO. ~~7934~~ 6787-15P
SHIPMENT NO.
REQ. NO.
AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-002

DEPTH: 60 - 61.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR. 140'

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002-S12 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS (MA), PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/11/2010

BY: RIFAAT NASHED | TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 - 16P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED JAN 21 2011

☐ DISTRICT OIP... OR ☐ TRANS. ☐ DIS. MAT L... JR. ☐ PAV'T. S ☐ RESIDENT ENGINEER ☐ ACCOUNT ☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	99				
8	99				
16	98				
30	97				
50	96				
100	92				
200	84				
5μ	51				
1μ	36				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture - 24.2%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OVE ☐ BULK (SSD ☐ APPAREN

LL. 41 P.L. 17 P.I. 24

CV

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

FINE | AS REC'D. | CRUSHED

REL. COMPACTION | IN PLACE | DENSITY | MOISTURE | % REL. COMP. | SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATI...

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708241

AUG 16 2010

6787-16P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE
☐ INDEPENDENT ASSURANCE
☐ ... TRAN...
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO. ——

DIST. LAB NO. ~~7334~~ 6787-16P

... REQ. NO.

AUTHORIZATION

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-002

DEPTH 65-66.5' 140'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-S13 AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/11/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-17P

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 21 2010

BILLED

☐ DISTRICT DIRECTOR ☐ TRANS. L
☐ DIS. MAT LS. ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNTI
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 30.4 %

REMARKS:

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX

R VALUE
EXUDATION PRESSURE
EXPANSION PRESSURE
AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED–ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE–GMS				
HEIGHT OF BRIQUETTE–INCHES				
DRY DENSITY OF BRIQ. – # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R–VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R – VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPAREN

LL. 45 P.L 20 P.I. 25

CV

S.E. AS REC'D. / CRUSHED / COMBINED

LART GRADE 100 REV. / 500 REV.

DUR D_f / D_c

% CRUSHED PARTICLES

FINE / AS REC'D. / CRUSHED

REL. COMPACTION: IN PLACE / DENSITY / MOISTURE / % REL. COMP. / SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708242

AUG 16 2010

6787-17P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE
☐ SPECIAL TEST

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☑ DIST. LAB ☐ TRANS. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-17P

REQ. NO.

AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-002

DEPTH: 70 - 71.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR. 140#

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002 -S14

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/11/2010

BY: RIFAAT NASHED TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787_ 18P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR ☐ TRANS. ☐ DIS. MAT LS ☐ PAV'T. SE ☐ RESIDENT ENGINEER ☐ ACCOUNT ☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. ☐ LIMITS SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	99				
16	99				
30	99				
50	99				
100	97				
200	90				
5μ	44				
1μ	28				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture - 25.5%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRIUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

	A	B	C	D
TEST SPECIMEN				
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC.

LL. 34 P.L. 16 P.I. 18

CV

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT — FINE | CO

AS REC'D.

CRUSHED

REL. COMPACTION D

	IN PLACE	OPT.
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708243

☐ PRELIMINARY TESTS ☑ PROCESS TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7234~~ 6787-18P

6787-18P

AUG 16 2010

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-002

DEPTH: 75-76.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

140'F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002-S15 AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/11/2010

BY: RIFAAT NASHED TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev. 10/78)

TEST NO. 6787 _ 22P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 23 2010

☐ DISTRICT DIRECTOR ☐ TRANS. L
☐ DIS. MAT LS. ENGR. ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNTI
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. ☐ LIMITS SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture - 30.9%.

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED–ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE–GMS				
HEIGHT OF BRIQUETTE–INCHES				
DRY DENSITY OF BRIQ. – # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R–VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R – VALUE BY EXPANSION				

TEST RESULTS SPEC.

LL. 56 P.L. 21 P.I. 35

CV

S.E.: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

FINE C

AS REC'D.

CRUSHED

REL. COMPACTION D

IN PLACE OP

DENSITY

MOISTURE

% REL. COMP.

SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708247

6787-22P

AUG 16 2010

☐ PRELIMINARY TESTS
☑ CONTROL TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
DIST. LAB
TRANS. LAB
SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~79374~~ 6787-22P

SHIPMENT NO.

P.O. OR REQ. NO.

AUTHORIZATION

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-002

DEPTH 85-86.5

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

140'

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-S17

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/ /2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46243

TEST NO. 6787 - 19P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED JAN 21 2011

☐ DISTRICT DIRECTOR ☐ DIS. MAT. ENGR. ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS ☐ PAV'T ☐ ACCOU ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	100				
50	99				
100	86				
200	55				
5µ	21				
1µ	13				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE - 26.9%

REMARKS: UNABLE TO RUN CTM 204 BECAUSE MATERIAL IS SANDY NON-PLASTIC.

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

LL. N/P P.L. N/P P.I. N/P

CV

FINE

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

AS REC'D. / CRUSHED

REL. COMPACTION: IN PLACE / DENSITY / MOISTURE / % REL. COMP. / SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708244

AUG 16 2010

6787-19P

☑ PRELIMINARY TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☑ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 19P

AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-002

DEPTH: 90 - 91.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK

140 / 16 / RR

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-00-S18 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: (MA) PARTICLE-SIZE ANALYSIS, PI WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/11/2010

BY: RIFAAT NASHED | TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS: 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR: CA94612

PHONE: 510-622-1775 . FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46243

TEST NO. 6787-20p

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR...OR ☐ TRANS. ☐ DIS. MAT LS ...R. ☐ PAV'T. S ☐ RESIDENT ENGINEER ☐ ACCOUNT ☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	99				
50	98				
100	90				
200	71				
5µ	36				
1µ	23				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 25.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC.

LL. 29 P.L 14 P.I. 15

CV

S.E: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_r / D_c

% CRUSHED PARTICLES

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT | FINE | AS REC'D. | CRUSHED

REL. COMPACTION: IN PLACE | OP... ; DENSITY ; MOISTURE ; % REL. COMP. ; SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708245

AUG 16 2010

6787-20p

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS.
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH ☐ DIST.

FIELD NO. ____

DIST. LAB NO. ~~7934~~ 6787-20p

SHIPMENT NO. / OR REQ. NO.

AUTHORIZATION NO.

SAMPLE OF Soil

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-002

DEPTH 95 - 96.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR

140'

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-S19 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/11/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 21P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED JAN 21 2011

☐ DISTRICT DIR... OR ☐ TRANS. ...
☐ DIS. MAT L... ...R. ☐ PAV'T. S...
☐ RESIDENT ENGINEER ☐ ACCOUNT...
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	100				
50	100				
100	100				
200	98				
5μ	67				
1μ	46				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 28.8%

REMARKS:

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX
R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.
INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

LL. P.L P.I.
CV
S.E: AS REC'D. / CRUSHED / COMBINED
LART: GRADE 100 REV. / 500 REV.
DUR: D_f / D_c
% CRUSHED PARTICLES

FINE | C...
AS REC'D.
CRUSHED

REL. COMPACTION D...
IN PLACE | OPT...
DENSITY
MOISTURE
% REL. COMP.
SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708246

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☑ BRANCH LAB
☑ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~

LOT NO. 6787-21P

SHIPMENT NO. | P.O. OR REQ. NO.

AUTHORIZATION NO.

6787-21P

AUG 16 2010

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-002

DEPTH 100 - 101.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-S20 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/11/2010

BY RIFAAT NASHED | TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 . FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46743

TEST NO. 6787-45P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED FEB 07 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT L. ENGR. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	99				
8	98				
16	97				
30	96				
50	93				
100	85				
200	68				
5μ	29				
1μ	18				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 16.1%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

-TL-361 (Rev.10/78)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (OV) ☐ BULK (SS) ☐ APPARENT	
LL. 30 P.L. 18 P.I. 12			FINE
CV		AS REC'D.	
S.E AS REC'D.		CRUSHED	
S.E CRUSHED			
S.E COMBINED		REL. COMPACTION	
LART GRADE 100 REV.			IN PLACE
LART GRADE 500 REV.		DENSITY	
DUR D_f		MOISTURE	
DUR D_c		% REL. COMP.	
% CRUSHED PARTICLES		SPEC.	

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

AUG 30 2010

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708270

6787-45P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB

SHIPMENT

AUTHORIZATION

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-45P

REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-003

DEPTH 5-6.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR

140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S1

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE ANALYSIS (MA), PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46943

TEST NO. 6787 - 46P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 07 2011

☐ DISTRICT DIR... ☐ TRANS. ...
☐ DIS. MAT L... ☐ PAV'T. S...
☐ RESIDENT ENGINEER ☐ ACCOUNT...
☐ CONSTRUCTION ☐

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	99				
8	98				
16	98				
30	97				
50	96				
100	90				
200	72				
5μ	19				
1μ	13				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT.	% BY VOL.	TEST NO.	DESCRIPTION

% MOISTURE = 24.2%

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

TEST RESULTS	SPEC.
LL. 31 P.L. 20 P.I. 11	
CV	
S.E. AS REC'D	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_F	
DUR D_C	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVE... ☐ BULK (SSD... ☐ APPAREN...

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE
DENSITY	
MOISTURE	
% REL. COMP.	
SPEC.	

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTAT...

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CAR...BER C708271

6787-46P

AUG 30 2010

☐ ...ARY TESTS
☐ PROCE... TESTS
☐ ACCEP... TESTS
... INDEPEND... T...
... SURANC... TESTS
☐ ... LAB
☐ ... LAB
☒ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST.

FIELD NO.

DIST. LAB NO. ~~79..~~ 6787-46P

SHIPMENT ...

AUTHORIZATION NO.

...O. OR REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-003

DEPTH 10-11.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

140

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S2

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

(MA) PARTICLE-SIZE ANALYSIS, PI
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 - 47P
BILLED

DATE RECEIVED AUG 30 2010
CALC. BY ______ APPROVED BY ______
DATE REPORTED FEB 07 2011

☐ DISTRICT DIR ☐ DIS. MAT L ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS. LA ☐ PAV'T. SEC ☐ ACCOUNTIN ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	99				
8	96				
16	96				
30	95				
50	93				
100	76				
200	49				
5μ	19				
1μ	13				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture - 31.3%

REMARKS:

SURFACE
BASE
SUBBASE

GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX
R VALUE: EXUDATION PRESSURE
EXPANSION PRESSURE
AT EQUILIBRUM SPEC.
INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 27 P.L 19 P.I. 8	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	CO
AS REC'D.		
CRUSHED		

REL. COMPACTION D

	IN PLACE	OPT
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORT.

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708272

6787-47P

AUG 30 2010

☐ PRELIMINARY TESTS
☑ ... TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HQTRS. LAB ☐ BRANCH LAB ☑ DIST. LAB

FIELD NO.
LAB NO. ~~7934~~ 47P
SHIPMENT NO.
P.O. FOR FP NO.
AUTHORIZATION NO.

SAMPLE OF SOIL
FOR USE IN BRIDGE FOUNDATION DESIGN
SAMPLE FROM BORING R-10-003
DEPTH 15 - 16.5'
LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR. 140'F
THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003 S3
AND IS ONE OF A GROUP OF
SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)
OWNER OR MANUFACTURER CALTRANS
TOTAL QUANTITY AVAILABLE
TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY
DATE NEEDED 09/24/10
REMARKS
PARTICLE ANALYSIS (MA) PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER
DATE SAMPLED 08/17/2010
BY RIFAAT NASHED TITLE T.E. (CIVIL)
DIST, CO, RTE, PM
04-SM-101-0.0
LIMITS
CONT. NO. 235620 PROJect 0400000678
FED. NO. SUB OBJECT 160
RES. ENGR. OR SUPT. TUNG NGUYEN.
ADDRESS 111 GRAND AVE, MS16, 8th FL OAKLAND
CONTRACTOR CA94612
PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100
EXUDATION PRESSURE (PSI)

87 40243

TEST NO. 6787 - 48P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED FEB 07 2011

☐ DISTRICT DIR...OR ☐ TRANS. LA...
☐ DIS. MAT LS. ...R. ☐ PAV'T. SECT...
☐ RESIDENT ENGINEER ☐ ACCOUNTI...
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 69.2%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 53 P.L 27 P.I. 26	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
L.A.RT GRADE 100 REV.	
L.A.RT 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	CO...
AS REC'D.		
CRUSHED		

REL. COMPACTION D...

	IN PLACE	OPT...
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTAT...

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708273

AUG 30 2010

6787-48P

☐ PRELIMINARY TESTS
☐ PROCESS ...
ACCEPTA... TESTS
DEPEND...
ASSURANCE TESTS
...
SPECIAL TESTS

SAMPLE SENT TO: HDQTRS. L... ; BRANCH ... ; DIST. L...

FIELD NO.

DIST. LAB NO. 6787-48P

...REQ. NO.

...AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-003

DEPTH 20-21.5

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S4 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS

PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

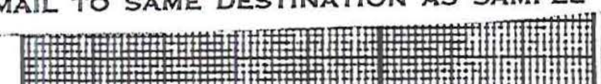
RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE



-TL-361 (Rev. 10/78)

TEST NO. 6787-49P
BILLED

DATE RECEIVED AUG 30 2010
CALC. BY ________ APPROVED BY ________
DATE REPORTED FEB 07 2011

☐ DISTRICT DIRECTOR ☐ TRANS. I
☐ DIS. MAT LS ...R. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾	100				
½	95				
⅜	93				
4	79				
8	67				
16	56				
30	49				
50	42				
100	34				
200	27				
5μ	14				
1μ	8				

GRADING AS USED WAS OBTAINED AS FOLLOWS:
% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 22.3%

REMARKS:

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX
R VALUE: EXUDATION PRESSURE
EXPANSION PRESSURE
AT EQUILIBRUM SPEC.
INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS — SPEC. — SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

LL. P.L P.I.
CV
S.E: AS REC'D. / CRUSHED / COMBINED
LART: GRADE 100 REV. / 500 REV.
DUR: D_f / D_c
% CRUSHED PARTICLES

FINE: AS REC'D. / CRUSHED

REL. COMPACTION — IN PLACE
DENSITY
MOISTURE
% REL. COMP.
SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

AUG 30 2010

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)
CARD NUMBER C708274

☐ PRELIMINARY TESTS
☑ PROJECT TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE
☐ DIST
☐ TRAN
☐ SPECIAL TESTS

SAMPLE SENT TO: ☑ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST LAB
SHIPMENT NO.
AUTHORIZATION NO.
FIELD NO.
LAB NO. ~~7957~~ 49P
REQ. NO.

6787-49P

SAMPLE OF: SOIL
FOR USE IN: BRIDGE FOUNDATION DESIGN
SAMPLE FROM: R-10-003
DEPTH: 25-26.5
LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-003-S5
AND IS ONE OF A GROUP OF
SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)
OWNER OR MANUFACTURER: CALTRANS
TOTAL QUANTITY AVAILABLE
TEST RESULTS DESIRED: ☑ NORMAL ☐ PRIORITY
DATE NEEDED: 09/24/10
REMARKS:
PARTICLE-SIZE ANALYSIS (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER
DATE SAMPLED: 08/17/2010
BY: RIFAAT NASHED TITLE: T.E. (Civil)
DIST, CO, RTE, PM: 04-SM-101-0.0
LIMITS
CONT. NO. 235620 PROJECT 0400000678
FED. NO. SUB OBJECT 160
RES. ENGR. OR SUPT. TUNG NGUYEN
ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND
CONTRACTOR CA94612
PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100
EXUDATION PRESSURE (PSI)

87 46243

TEST NO. 6787-50P

DATE RECEIVED AUG 30 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED FEB 07 2011

BILLED

☐ DISTRICT DIRECTOR ☐ DIS. MAT LS R. ☐ RESIDENT ENGINEER ☐ CONSTRUCTION ☐ TRANS. ☐ PAV'T. S ☐ ACCOUNT ☐

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1	100				
¾	97				
½	96				
⅜	94				
4	88				
8	80				
16	71				
30	61				
50	43				
100	32				
200	25				
5μ	15				
1μ	10				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 26.0%

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

LL. P.L P.I. | FINE

CV | AS REC'D. | CRUSHED

S.E: AS REC'D. / CRUSHED / COMBINED

REL. COMPACTION: IN PLACE

LART: GRADE 100 REV. / 500 REV. | DENSITY

DUR: D_f / D_c | MOISTURE | % REL. COMP.

% CRUSHED PARTICLES | SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708275

AUG 30 2010

6787-50P

☐ PRELIMINARY TESTS ☑ ... TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH ☐ DIST. LAB

FIELD NO.-

DIST. LAB NO. ~~7934~~ -50P

REQ. NO.-

SHIPMENT NO.

AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-003

DEPTH: 30-31.5' 140'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-003-S6 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: PARTICLE-SIZE ANALYSIS (MA), WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/17/2010

BY: RIFAAT NASHED | TITLE: T.E. (Civil)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUBOBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46343

TEST NO. 6787 — 5P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 07 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1	100				
¾	95				
½	92				
⅜	85				
4	72				
8	60				
16	50				
30	40				
50	25				
100	17				
200	13				
5µ	9				
1µ	5				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 22.3 %

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

LL. P.L P.I.

CV

FINE

S.E: AS REC'D. / CRUSHED / COMBINED

AS REC'D. / CRUSHED

LART: GRADE 100 REV. / 500 REV.

REL. COMPACTION: IN PLACE / DENSITY / MOISTURE / % REL. COMP.

DUR: D_f / D_c

% CRUSHED PARTICLES | SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATI[ON]

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708276

AUG 30 2010

6787-5P

☐ PRELIMINARY TESTS ☐ PROGRESS TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ DIST... ☐ ... SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-5P

SHIPMENT NO. | ...EQ. NO.

AUTHORIZATION

SAMPLE OF soil

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-003

DEPTH 35-36.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK [illegible] 140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S7 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE. MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

87 46243

TEST NO. 6787 - 52P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY______ APPROVED BY______

DATE REPORTED FEB 07 2011

☐ DISTRICT DIRECTOR ☐ TRANS. L.
☐ DIS. MAT LS ... JR. ☐ PAV'T. SEC
☐ RESIDENT ENGINEER ☐ ACCOUNTING
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½	100				
⅜	99				
4	96				
8	93				
16	91				
30	89				
50	84				
100	72				
200	55				
5μ	20				
1μ	10				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 24.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. 26 P.L 18 P.I. 8	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	C
AS REC'D.		
CRUSHED		

REL. COMPACTION

	IN PLACE	OP
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708277

6787-52P

AUG 30 2010

☐ PRELIMINARY TESTS
☑ ... TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
... DIST. LAB
... TRANS LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB

FIELD NO.
LAB NO. 7934
... 2P

SHIPMENT NO.
AUTHORIZATION

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-003

DEPTH 40 - 41.5' 140°F

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S8

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE ANALYSIS, PI, WATER CONTENT (MA)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 - 53P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 07 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS ... R. ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUN
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	99				
16	99				
30	98				
50	98				
100	96				
200	92				
5µ	49				
1µ	27				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 33.8%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED–ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE–GMS				
HEIGHT OF BRIQUETTE–INCHES				
DRY DENSITY OF BRIQ. – # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R–VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R–VALUE BY EXPANSION				

TEST RESULTS | SPEC.

LL. 38 P.L. 17 P.I. 21

CV

S.E.: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

SP. GR. ☐ BULK (OV) ☐ BULK (SS) ☐ APPARENT

FINE

AS REC'D.

CRUSHED

REL. COMPACTION

IN PLACE

DENSITY

MOISTURE

% REL. COMP.

SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708278

6787-53P

AUG 30 2010

☐ PRELIMINARY TESTS
☐ ... TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO:
☑ HDQTRS. LAB
☐ BRANCH
☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 53P

SAMPLE OF Soil

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-003

DEPTH 45-46.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR 140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S9

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS (MA) PARTICLE-SIZE ANALYSIS, PI WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775. FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

TEST NO. 6787 - 54P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 07 2011

☐ DISTRICT DIR' 'OR ☐ TRANS.
☐ DIS. MAT LS 'R. ☐ PAV'T. SI
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	99				
30	99				
50	99				
100	99				
200	98				
5μ	48				
1μ	30				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT.	% BY VOL.	TEST NO.	DESCRIPTION
% Moisture - 40.1%			

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE
- EXUDATION PRESSURE
- EXPANSION PRESSURE
- AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS — SPEC.

LL. 44 P.L. 21 P.I. 23

CV

S.E.: AS REC'D. / CRUSHED / COMBINED

LART: GRADE 100 REV. / 500 REV.

DUR: D_f / D_c

% CRUSHED PARTICLES

SP. GR. ☐ BULK (OV ☐ BULK (SSD ☐ APPAREN — FINE

AS REC'D. / CRUSHED

REL. COMPACTION — IN PLACE / DENSITY / MOISTURE / % REL. COMP. / SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708279

AUG 30 2010

6787-54P

☐ PRELIMINARY TESTS ☑ [?] TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ DIST. LAB ☐ TRANS. LAB ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH ☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 54P

SHIPMENT NO.

AUTHORIZATION NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-003

DEPTH: 50-51.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

140 PF

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-003-S10

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: PARTICLE ANALYSIS, PI, WATER CONTENT (MK)

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/17/2010

BY: RIFAAT NASHED TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS.16, 8TH FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46243

TEST NO. 6787 - 55P

DATE RECEIVED AUG 30 2010
CALC. BY ___ APPROVED BY ___
DATE REPORTED FEB 07 2011

BILLED

☐ DISTRICT DIR OR ☐ TRANS. L
☐ DIS. MAT LS. R. ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNTI
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture - 35.7%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
L.L. 43 P.L. 17 P.I. 26	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVE ☐ BULK (SSD) ☐ APPARENT

	FINE	
AS REC'D.		
CRUSHED		

REL. COMPACTION

	IN PLACE	OP
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

FORM DCR-TL-101 HERE

STATE OF CALIFORNIA • DEP... SION PRESSURE CHA
SAMPLE IDENTIFICATION C... 0708280
TL-0101 (REV. 10/97)

AUG 30 2010

6787-55P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST.

FIELD NO.
DIST. LAB NO. ~~7934~~ 55P
REQ. NO.

SAMPLE OF SOIL
FOR USE IN BRIDGE FOUNDATION DESIGN
SAMPLE FROM BORING R-10-003
DEPTH 55-56.5'
LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S11
AND IS ONE OF A GROUP OF
SAMPLES REPRESENTING (TONS, GALS, BBLS, STA. ETC.)
140'

OWNER OR MANUFACTURER CALTRANS
TOTAL QUANTITY AVAILABLE
TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY
DATE NEEDED 09/24/10
REMARKS
PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER
DATE SAMPLED 08/17/2010
BY RIFAAT NASHED TITLE T.E. (CIVIL)
DIST, CO, RTE, PM
04-SM-101-0.0
LIMITS

CONT. NO. 235620 Project 0400000678
FED. NO. SUB OBJECT 160
RES. ENGR. OR SUPT. TUNG NGUYEN
ADDRESS 111 GRAND AVE, MS16, 8TH FL OAKLAND
CONTRACTOR CA94612
PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 40243

TEST NO. 6787 - 56P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ___ APPROVED BY ___

DATE REPORTED FEB 07 2011

☐ DISTRICT DIR ___ OR ☐ TRANS.
☐ DIS. MAT LS ___ R. ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUN
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜	100				
4	96				
8	93				
16	87				
30	81				
50	68				
100	49				
200	37				
5μ	21				
1μ	13				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture - 21.8 %

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

	A	B	C	D
TEST SPECIMEN				
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R - VALUE BY EXPANSION				

TEST RESULTS		SPEC.
LL. P.L P.I.		
CV		
S.E	AS REC'D	
	CRUSHED	
	COMBINED	
LART	GRADE 100 REV.	
	500 REV.	
DUR	D_f	
	D_c	
% CRUSHED PARTICLES		

SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE
DENSITY	
MOISTURE	
% REL. COMP.	
SPEC.	

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708281

AUG 30 2010

6787-56P

☐ PRELIMINARY TESTS ☐ PRODUCTION TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ DISPUTE ☐ TESTS ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO. ___

DIST. LAB ~~6834~~ 6787-56P

SHIPMENT NO.

FR NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-003

DEPTH 60-61.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR

140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S12

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS (MA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000673

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNE NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8th FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-57P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ___ APPROVED BY ___

DATE REPORTED FEB 07 2011

☐ DISTRICT DIRECTOR ☐ TRANS. LAB
☐ DIS. MAT. L. ENGR. ☐ PAV'T. SEC.
☐ RESIDENT ENGINEER ☐ ACCOUNTING
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1	100				
¾	98				
½	97				
⅜	97				
4	95				
8	94				
16	93				
30	92				
50	92				
100	88				
200	75				
5μ	30				
1μ	19				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture = 32.9%

REMARKS:

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED–ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE–GMS				
HEIGHT OF BRIQUETTE–INCHES				
DRY DENSITY OF BRIQ. – # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R–VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R–VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

LL. 32 P.L. 18 P.I. 14

CV

			FINE	CO
S.E	AS REC'D.	AS REC'D.		
	CRUSHED	CRUSHED		
	COMBINED	REL. COMPACTION DA		
LART	GRADE 100 REV.		IN PLACE	OPT
	500 REV.	DENSITY		
DUR	D_f	MOISTURE		
	D_c	% REL. COMP.		
% CRUSHED PARTICLES		SPEC.		

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE — EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORT

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708282

☐ PRELIMINARY TESTS ☑ PROCESS TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BR ☑ D ☐ DIST. ☐ TRANS LAB

AUG 30 2010

6787-57P

FIELD NO.

DIST. LAB NO. ~~7934~~

LOT NO. 6787-57P

P.O. OR REQ. NO.

SHIPMENT NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-003

DEPTH 65 – 66.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S13 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS
PARTICLE ANALYSIS (MA), PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM
04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8th FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46243

TEST NO. 6787 - 58P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 08 2011

☐ DISTRICT DIR OR ☐ TRANS.
☐ DIS. MAT LS. SR. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT.	% BY VOL.	TEST NO.	DESCRIPTION

% MOISTURE = 31.2%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET. WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPAREN	
LL. 39 P.L 18 P.I. 21			FINE
CV		AS REC'D.	
S.E AS REC'D.		CRUSHED	
S.E CRUSHED		REL. COMPACTION	
S.E COMBINED			IN PLACE
LART GRADE 100 REV.		DENSITY	
LART 500 REV.		MOISTURE	
DUR D_f		% REL. COMP.	
DUR D_c		SPEC.	
% CRUSHED PARTICLES			

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708283

AUG 30 2010

6787-58P

☐ PRELIMINARY TESTS
☑ TE...
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ ...
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS LAB ☐ BRANCH LAB ☑ DIST...

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-58P

SHIPMENT NO.

...OR REQ. NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-003 140'±

DEPTH 75 - 76.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003 15

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/18/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46743

TEST NO. 6787 - 59P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED FEB 09 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS R. ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUN
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	99				
50	99				
100	99				
200	98				
5μ	87				
1μ	58				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 33.7%

REMARKS:

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE | CHARGE | EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE) | ACTIVITY OR OBJECT | AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (OV) ☐ BULK (SS) ☐ APPARENT	
LL. 65 P.L. 24 P.I. 41			FINE
CV		AS REC'D.	
S.E. AS REC'D.		CRUSHED	
S.E. CRUSHED			
S.E. COMBINED		REL. COMPACTION	
LART GRADE 100 REV.			IN PLACE
LART GRADE 500 REV.		DENSITY	
DUR D_f		MOISTURE	
DUR D_c		% REL. COMP.	
% CRUSHED PARTICLES		SPEC.	

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)
CARD NUMBER C708284

AUG 30 2010

6787-59P

☐ PRELIMINARY TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE ☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST.

FIELD NO.

DIST. LAB NO. ~~7934~~ 59P

SHIPMENT NO. | REQ. NO. | AUTHORIZATION NO.

SAMPLE OF: Soil

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-003

DEPTH: 80-81.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK 140 ft

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-003-S16 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: (MA) PARTICLE-SIZE ANALYSIS, PI WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/18/2010

BY: RIFAAT NASHED TITLE: T.E. (civil)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787- 60P

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 09 2011

BILLED

☐ DISTRICT DIR[illegible]TOR ☐ TRANS. [illegible]
☐ DIS. MAT LS. [illegible]R. ☐ PAV'T. S[illegible]
☐ RESIDENT ENGINEER ☐ ACCOUNT[illegible]
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5µ					
1µ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 39.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

-TL-361 (Rev.10/78)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED—ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE—GMS				
HEIGHT OF BRIQUETTE—INCHES				
DRY DENSITY OF BRIQ. — # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R—VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R—VALUE BY EXPANSION				

TEST RESULTS	SPEC.
L.L. 64 P.L. 24 P.I. 40	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OV[illegible]) ☐ BULK (SSD) ☐ APPAREN[illegible]

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE
DENSITY	
MOISTURE	
% REL. COMP.	
SPEC.	

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATI[illegible]

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708285

AUG 30 2010

6787-60P

☐ PRELIMINARY TESTS
☑ [illegible]TE[illegible]
☐ ACCEPT[illegible]
☐ INDEPEN[illegible]
☐ TRANS[illegible]
SPECIAL [illegible]

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-60P

[illegible] OR REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-003

DEPTH 85-86.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S17

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/18/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-61P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ___ APPROVED BY ___

DATE REPORTED FEB 07 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUN
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	99				
30	99				
50	94				
100	78				
200	66				
5µ	26				
1µ	15				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% Moisture = 25.8%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPAREN
LL. P.L P.I.		FINE
CV		AS REC'D.
S.E AS REC'D.		CRUSHED
S.E CRUSHED		REL. COMPACTION
S.E COMBINED		IN PLACE
LART GRADE 100 REV.		
LART GRADE 500 REV.		DENSITY
DUR D_f		MOISTURE
DUR D_c		% REL. COMP.
% CRUSHED PARTICLES		SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATI

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708286

AUG 30 2010

6787-61P

☐ PRELIMINARY TESTS ☑ ... TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE ... ☐ SPECIAL TESTS

SAMPLE SENT TO: HDQTRS. LAB / BRANCH LAB / DIST. L...

FIELD NO.

DIST. LAB NO. ~~7234~~ 6787-61P

P.O. ... REQ. NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-003

DEPTH 90-91.5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK BR.

1407

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003-S18

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS (MA) PARTICLE-SIZE ANALYSIS, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/18/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000673

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787 - 62P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED FEB 07 2011

☐ DISTRICT DIR. OR ☐ TRANS.
☐ DIS. MAT LS. ENGR. ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUN
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4	100				
8	100				
16	100				
30	100				
50	98				
100	73				
200	33				
5μ	18				
1μ	12				

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

% MOISTURE = 25.4%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE — EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED—ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE—GMS				
HEIGHT OF BRIQUETTE—INCHES				
DRY DENSITY OF BRIQ. — # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R—VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R—VALUE BY EXPANSION				

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (O ☐ BULK (S ☐ APPAR	
LL. P.L P.I.			FINE
CV		AS REC'D.	
S.E AS REC'D.		CRUSHED	
S.E CRUSHED			
S.E COMBINED		REL. COMPACTION	
LART GRADE 100 REV.			IN PLACE
LART 500 REV.		DENSITY	
DUR D_f		MOISTURE	
DUR D_c		% REL. COMP.	
% CRUSHED PARTICLES		SPEC.	

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

AUG 30 2010

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708287

☐ PRELIMINARY TESTS
☐ ... TESTS
☐ ACCEPTANCE TESTS
DEPENDENT ...
☐ ...
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB
SHIPMENT ...
AUTHORIZATION NO.

FIELD NO.

DIST. LAB NO. ~~7234~~ 6787-62P

... OR REQ. NO.

6787-62P

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-003

DEPTH: 95-96.5' 140'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-003 S19

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

PARTICLE-SIZE ANALYSIS (HA)
WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/18/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

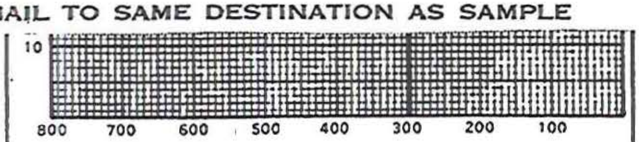
RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE



TEST NO. 6787 - 63P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED FEB 10 2011

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS. ENGR. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5µ					
1µ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

% Moisture - 29.3%

REMARKS:

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRIUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED—ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE—GMS				
HEIGHT OF BRIQUETTE—INCHES				
DRY DENSITY OF BRIQ. — # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS | SPEC. | SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

LL. 40 P.L 17 P.I. 23

CV

FINE

S.E: AS REC'D. / CRUSHED / COMBINED

AS REC'D. / CRUSHED

LART: GRADE 100 REV. / 500 REV.

REL. COMPACTION — IN PLACE — DENSITY — MOISTURE — % REL. COMP.

DUR: D_f / D_c

% CRUSHED PARTICLES

SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708288

☐ PRELIMINARY TESTS
☑ PRELIMINARY TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE
☐ ...
☐ ...
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☑ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~

DIST. REQ. NO. 6787 63P

6787-63P

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-003

DEPTH: 100-101.5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

140'

AUG 30 2010

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-003-S20 | AND IS ONE OF A GROUP OF | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY | DATE NEEDED 09/24/10

REMARKS: PI, WATER CONTENT

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/18/2010

BY: RIFAAT NASHED | TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8th FL OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 40243

TEST NO. 6787-1P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED NOV 12 2010

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS[redacted]R. ☐ PAV'T.
☐ RESIDENT ENGINEER ☐ ACCOUN
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

Resistivity = 4572
SPECS: 1000 Ω-cm (min)

REMARKS:
PH = 7.6
(SPECS: 5.5 (min))

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX

R VALUE
EXUDATION PRESSURE
EXPANSION PRESSURE
AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.	SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE
LL. P.L P.I.		FINE
CV		AS REC'D.
S.E. AS REC'D.		CRUSHED
S.E. CRUSHED		REL. COMPACTION
S.E. COMBINED		IN PLACE
LA RT GRADE 100 REV.		DENSITY
LA RT 500 REV.		MOISTURE
DUR D_f		% REL. COMP.
DUR D_c		SPEC.
% CRUSHED PARTICLES		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708226

AUG 16 2010

6787-1P

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ LAB
DIST. LAB
SHIPMENT
AUTHORIZATION NO.

FIELD NO.
DIST. LAB NO. ~~7934~~ 6787-1P
OR REQ. NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: R-10-001

DEPTH: 1-5'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK BR.

140 pcf

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-001 B1

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS
CORROSION TEST

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM
04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160 (PHASE: 0)

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775 . FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 40243

TEST NO. 6787 - 2P

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 17 2010

BILLED

- [ ] DISTRICT DIRECTOR
- [ ] DIS. MAT LS. ___R.
- [ ] RESIDENT ENGINEER
- [ ] CONSTRUCTION
- [ ] TRANS.
- [ ] PAV'T.
- [ ] ACCOUN
- [ ]

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

(*) RESISTIVITY = 978

SPEC: 1000 Ω-cm (min)

REMARKS: PH = 7.2

(SPECS: 5.6 (min))

(*) MATERIAL SUBMITTED FOR TESTING FAILED MINIMUM SPECS. ALSO TO BE SENT TO METS-SACTO FOR SULFATE & CHLORIDE TEST.

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE

- EXUDATION PRESSURE
- EXPANSION PRESSURE
- AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS		SPEC.
LL. P.L P.I.		
CV		
S.E	AS REC'D.	
	CRUSHED	
	COMBINED	
LART GRADE	100 REV.	
	500 REV.	
DUR	D_f	
	D_c	
% CRUSHED PARTICLES		

SP. GR. [ ] BULK (OVE [ ] BULK (SSD [ ] APPAREN

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE	OF
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708227

6787-2P

AUG 16 2010

- [ ] PRELIMINARY TESTS
- [x] PROCESS TESTS
- [ ] ACCEPTANCE TESTS
- INDEPENDENT ASSURANCE TESTS
- [ ] SPECIAL TESTS

SAMPLE SENT TO:
- [ ] HDQTRS. LAB
- [ ] LAB
- DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-2P

REQ. NO.

SHIPMENT NO.

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-001

DEPTH 16.5-20'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-001 B2 AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED [x] NORMAL [ ] PRIORITY

DATE NEEDED 09/24/10

REMARKS

CORROSION TEST

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY TUNG NGUYEN TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8th FL. OAKLAND

CONTRACTOR CA 94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

TEST NO. 6787 - 3P

DATE RECEIVED AUG 16 2010

CALC. BY ____ APPROVED BY ____

DATE REPORTED DEC 17 2010

BILLED

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT L.S. ENGR. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUNT
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

Resistivity = 2700.
spec: 1000Ω-cm (min)

REMARKS: pH = 7.66
spec: 5.6 (min)

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS			SPEC.
LL.	P.L	P.I.	
CV			
S.E.	AS REC'D.		
	CRUSHED		
	COMBINED		
LART GRADE	100 REV.		
	500 REV.		
DUR	D_f		
	D_c		
% CRUSHED PARTICLES			

SP. GR. ☐ BULK (OVEN DRY) ☐ BULK (SSD) ☐ APPARENT

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION	IN PLACE
DENSITY	
MOISTURE	
% REL. COMP.	
SPEC.	

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

AUG 16 2010

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708228

☐ PRELIMINARY TESTS
☑ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

SHIPMENT NO. / AUTHORIZATION

FIELD NO.

DIST. LAB NO. ~~7934~~

LOT NO. 6787-3P

6787-3P

... OR REQ. NO.

SAMPLE OF: SOIL

FOR USE IN: BRIDGE FOUNDATION DESIGN

SAMPLE FROM: BORING R-10-002

DEPTH: 0.2 - 10' 40'

LOCATION OF SOURCE: SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS): R-10-002 B-1

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER: CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS: CORROSION TEST

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED: 08/10/2010

BY: RIFAAT NASHED TITLE: T.E. (CIVIL)

DIST, CO, RTE, PM: 04-SM-101-0.0

LIMITS

CONT. NO. 235620 Project 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT.: TUNG NGUYEN

ADDRESS: 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR: CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

TEST NO. 6787-23P

BILLED

DATE RECEIVED AUG 16 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 17 2010

☐ DISTRICT DIRECTOR ☐ TRANS. L
☐ DIS. MAT LS. ENGR. ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNTI
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

(*) RESISTIVITY = 394
SPECS: 1000 Ω-CM (MIN)

REMARKS: PH = 5.14
SPECS: 5.6 (MIN)

(*) MATERIAL/SAMPLE SENT TO METS-SACTO FOR CHLORIDE & SULFATE TESTING. MATERIAL SUBMITTED FOR TESTING FAILED MINIMUM SPECS.

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE	
EXUDATION PRESSURE	
EXPANSION PRESSURE	
AT EQUILIBRUM	SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED—ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE—GMS				
HEIGHT OF BRIQUETTE—INCHES				
DRY DENSITY OF BRIQ. — # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. P.L P.I.	
CV	
S.E AS REC'D	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	C
AS REC'D.		
CRUSHED		

REL. COMPACTION D

	IN PLACE	OP
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708248

6787-23P

AUG 16 2010

☐ PRELIMINARY TESTS
☑ PROOF TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☑ HDQTRS. LAB
☐ BRANCH LAB
☐ DIST. LAB

FIELD NO.

DIST. LAB NO. ~~7934~~ 6787-23P

SHIPMENT NO.

AUTHORIZATION

LAB. OR REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-002

DEPTH 20-25'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

140°F

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-002-B2

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

CORROSION TEST

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/10/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM
04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

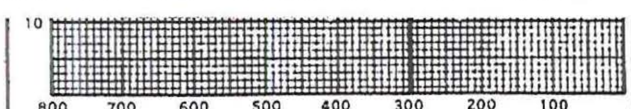
RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE



87 46943

TEST NO. 6787 — 43P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 17 2010

☐ DISTRICT DIRECTOR ☐ TRANS. ☐ DIS. MAT LS[redacted]R. ☐ PAV'T. S ☐ RESIDENT ENGINEER ☐ ACCOUNT ☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

RESISTIVITY = 2672
SPCS: 1000 Ω-cm (min)

REMARKS: PH = 7.45
(SPCS: 5.6 (min)

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED—ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE—GMS				
HEIGHT OF BRIQUETTE—INCHES				
DRY DENSITY OF BRIQ. — # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. P.L P.I.	
CV	
S.E. AS REC'D.	
S.E. CRUSHED	
S.E. COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OVE ☐ BULK (SSD ☐ APPAREN

	FINE
AS REC'D.	
CRUSHED	

REL. COMPACTION

	IN PLACE
DENSITY	
MOISTURE	
% REL. COMP.	
SPEC.	

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C708268

AUG 30 2010

6787-43P

☐ PRELIMINARY TESTS ☑ [illegible] TESTS ☐ ACCEPTANCE TESTS ☐ INDEPENDENT ASSURANCE TESTS ☐ DIST. ☐ TRANS. ☐ FINAL TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

FIELD NO.

LAB NO.

SHIPMENT NO.

P.O. OR BILLING

AUTHORIZATION NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM BORING R-10-003

DEPTH 2 - 5'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003 B1

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

CORROSION TEST.

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM

04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS16, 8TH FL. OAKLAND

CONTRACTOR CA94612.

PHONE: 510-622-1775 FAX 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

87 46743

TEST NO. 6787 - 44P

BILLED

DATE RECEIVED AUG 30 2010

CALC. BY ______ APPROVED BY ______

DATE REPORTED DEC 17 2010

☐ DISTRICT DIRECTOR ☐ TRANS.
☐ DIS. MAT LS. ENGR. ☐ PAV'T. S
☐ RESIDENT ENGINEER ☐ ACCOUN
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

Resistivity = 1926
Specs: 1000 Ω-cm (min)

REMARKS PH = 7.67
Specs: 5.5 (min)

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE
- EXUDATION PRESSURE
- EXPANSION PRESSURE
- AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION
SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED				
COMPACTOR FOOT PRESSURE P.S.I.				
INITIAL MOISTURE %				
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %				
WET WT. OF BRIQUETTE-GMS				
HEIGHT OF BRIQUETTE-INCHES				
DRY DENSITY OF BRIQ. - # CU. FT.				
STABILOMETER P_H AT 2000 LBS.				
DISPLACEMENT				
R-VALUE BY STABILOMETER				
EXUDATION PRES. P.S.I.				
THICK. BY STAB. FEET				
EXPANSION DIAL READING				
THICK. BY EXP. PRESS. FEET				
R-VALUE BY EXPANSION				

TEST RESULTS	SPEC.
LL. P.L P.I.	
CV	
S.E AS REC'D.	
S.E CRUSHED	
S.E COMBINED	
LART GRADE 100 REV.	
LART GRADE 500 REV.	
DUR D_f	
DUR D_c	
% CRUSHED PARTICLES	

SP. GR. ☐ BULK (OV ☐ BULK (SS ☐ APPARE

FINE

AS REC'D.

CRUSHED

REL. COMPACTION

IN PLACE

DENSITY

MOISTURE

% REL. COMP.

SPEC.

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)

CARD NUMBER C708269

6787-44P

AUG 30 2010

☐ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ DEFENDANCE TESTS
☐ SPECIAL TESTS

SAMPLE SENT TO: HDQTRS. LAB ☐ BRANCH LAB ☐ DIST. LAB

SHIPMENT

AUTHORIZATION NO.

FIELD NO.

DIST. LAB NO. 7834 6787-44P

OR REQ. NO.

SAMPLE OF SOIL

FOR USE IN BRIDGE FOUNDATION DESIGN

SAMPLE FROM R-10-003

DEPTH 5-10'

LOCATION OF SOURCE SAN FRANCISQUITO CREEK

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) R-10-003 B2

AND IS ONE OF A GROUP OF

SAMPLES REPRESENTING (TONS, GALS, BBLS, STA, ETC.)

OWNER OR MANUFACTURER CALTRANS

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☑ NORMAL ☐ PRIORITY

DATE NEEDED 09/24/10

REMARKS

CORROSION TEST

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 08/17/2010

BY RIFAAT NASHED TITLE T.E. (CIVIL)

DIST, CO, RTE, PM 04-SM-101-0.0

LIMITS

CONT. NO. 235620 PROJECT 0400000678

FED. NO. SUB OBJECT 160

RES. ENGR. OR SUPT. TUNG NGUYEN

ADDRESS 111 GRAND AVE, MS 16, 8TH FL. OAKLAND

CONTRACTOR CA94612

PHONE: 510-622-1775, FAX: 510-286-4839

MAIL TO SAME DESTINATION AS SAMPLE

800 700 600 500 400 300 200 100

EXUDATION PRESSURE (PSI)

<Rudy_C_Lopez@dot.ca.gov>
01/26/2011 12:32 PM

To <Tung_Nguyen@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - Soil, EA: 04-235620, P ID 0400000678 (Corr. #s CR110034 & CR110035)

History: This message has been forwarded.

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 1/26/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name: **SAN FRANCISQUITO CREEK**
Bridge Number: **35-0013**
EA No.: **04-235621**
EFIS No.: **0400000678**
Dist/Co/Rte/PM or KP: **04 / SM / 101 / 0.0**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C708227	SAN FRANCISQUITO CREEK	SOIL	16.5-20 FEET / BORE R-10-001,B2	978	7.2	163	781
C708248	SAN FRANCISQUITO CREEK	SOIL	20-25 FEET / BORE R-10-002, B2	394	5.14	778	6517

This site is corrosive (see note below for MSE wall backfill).

Controlling corrosion parameters are as follows:

- 5.14 pH
- 778 ppm Chloride
- 6517 ppm Sulfate

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater, pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

APPENDIX D

SEISMIC STUDY

Memorandum

Flex your power!
Be energy efficient!

To: MR. SAMAD HAMOUD
Senior Bridge Engineer
Division of Engineering Services
Office of Bridge Design-West
Bridge Design Branch 16

Date: September 23, 2010

File: 04-SM-101
04-235621
San Francisquito Cr. Br.
Bridge No. 35-0013

Attention: Mr. John E. Peterson

From: HOSSAIN SALIMI
Senior Materials and Research Engineer
Division of Engineering Services
Geotechnical Services – MS-5
Office of Geotechnical Design-West

Subject: Final Seismic Design Recommendations

This memorandum is in response to your request to provide the Final Seismic Design Recommendations for the proposed replacement of the existing 3-span San Francisquito Creek Bridge (Bridge No. 35-0013) on Highway 101 in the City of Palo Alto in San Mateo County with a new 4-span structure. It should be noted that a revised Preliminary Seismic Design Recommendation (Revised PSDR) was submitted to your Office in a report dated June 21, 2010.

Geology

The Office of Geotechnical Design-West conducted the field investigation for this site, which included three mud rotary borings (R-10-001, R-10-002, and R-10-003) drilled in August 2010 down to a maximum depth of 105 feet. Borehole R-10-001 was drilled near the proposed Abutment 1, whereas boreholes R-10-002 and R-10-003 were drilled near the proposed Abutment 5. Due to logistics and lack of access, areas near Bents 2, 3, and 4 could not be drilled. Based on this new information, the geology at the site consists of mostly loose sand, silty sand, and poorly graded sand with occasional layers of loose to medium dense silt layers, as well as layers of soft to stiff clay down to the bottom of the borings.

Ground Water

The common water table elevation for all three boring locations is elevation five feet, corresponding to 10 feet below original ground.

Seismicity

The revised PSDR included two graphs which were the spectrum comparisons (Figure 1) and the recommended preliminary response spectrum based on the USGS De-Aggregation procedure (Figure 2). The latest foundation investigation confirms the geology as outlined in the PSDR. Therefore, the recommended preliminary response spectrum included in the PSDR is still valid and considered final. Please see the attached figure.

Please note that the recommended Final Acceleration Response Spectrum curve has been modified to account for the proximity of the site to the fault. The modifications are such that there is no increase in spectral acceleration in periods less than 0.5 seconds and a 20% increase for periods greater than one second. A linear interpolation was used between 0.5 and one second.

Liquefaction Potential

Due to the seismicity of the site, the presence of loose to medium dense granular material(s), and relatively high water table, there is a potential for liquefaction during a seismic event.

At abutment 1, there is a moderate to high potential from elevation 5 feet to -5 feet, and from elevation -20 feet to -23 feet. At Abutment 3, there is a moderate to high potential from elevation 5 feet to -7 feet, and from -10 feet to -15 feet.

If there are any questions, please contact Hossain Salimi at (916) 227-7147.

Attachment

c: TPokrywka (OGD-W)
MMacaranes (OGD-W)
TNguyen (OGD-W)
GS File room
District Project Manager
District Environmental Planning
GS Corporate

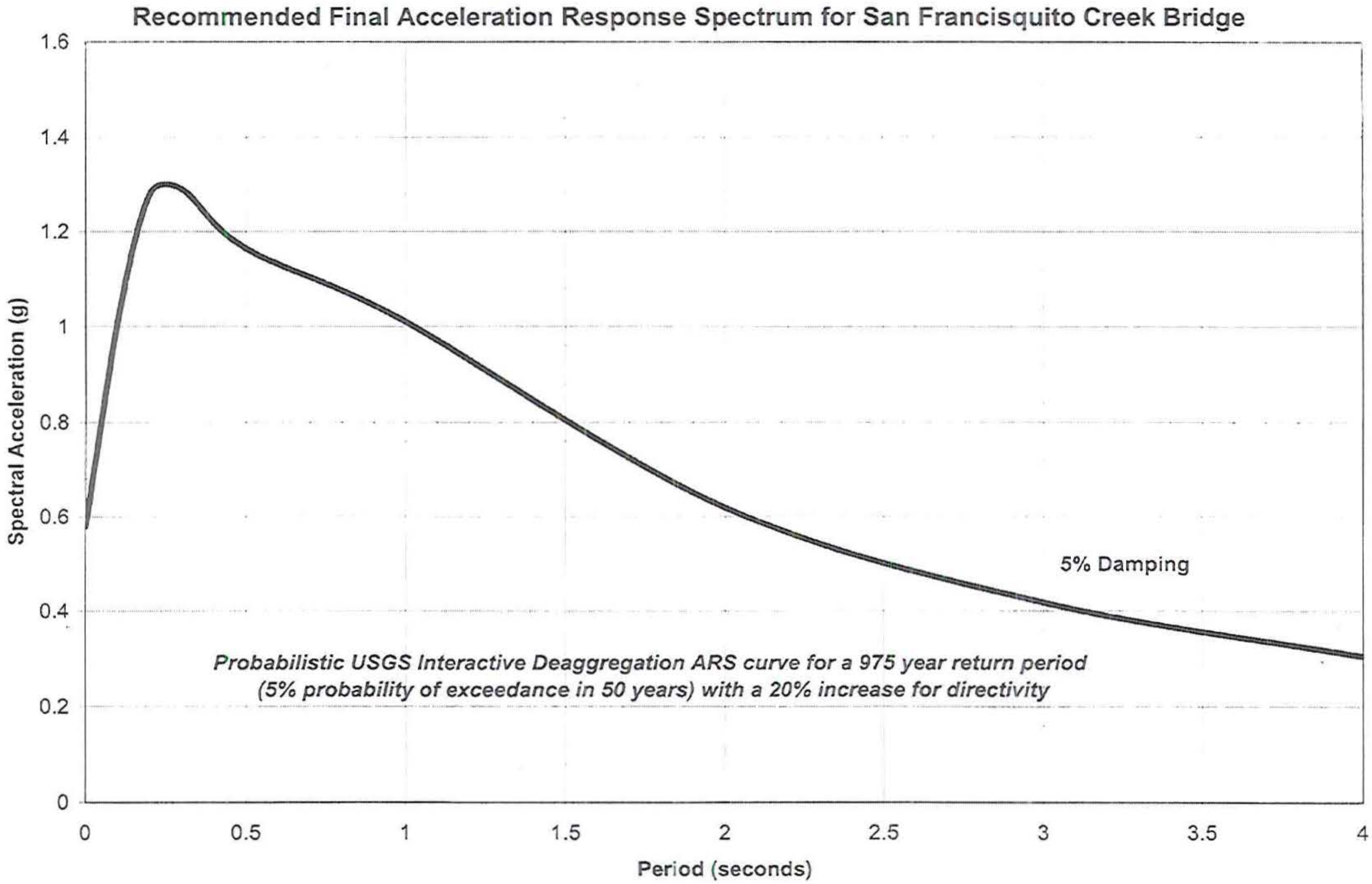

Recommended Final Acceleration Response Spectrum for San Francisquito Creek Bridge
Spectral Acceleration (g)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
0.5
1
1.5
2
2.5
3
3.5
4
Period (seconds)
5% Damping
Probabilistic USGS Interactive Deaggregation ARS curve for a 975 year return period
(5% probability of exceedance in 50 years) with a 20% increase for directivity

Figure 1

State of California
Department of Transportation

Structure Hydraulics

STRUCTURES
FINAL HYDRAULIC REPORT

SAN FRANCISQUITO CREEK
Br. No. 35-0348
Project: 04 0000 0678

Located on Route 101 in San Mateo County
04-SM-101-PM 0.01

This report has been prepared under my direction as the professional engineer in responsible charge of the work, in accordance with the provisions of the Professional Engineers Act of the State of California.

REGISTERED PROFESSIONAL ENGINEER
ANTHONY NEDWICK
No. C60368
Exp. 06/30/16
CIVIL
STATE OF CALIFORNIA

REGISTERED CIVIL ENGINEER

REGISTRATION NUMBER C 60368 DATE: November 7, 2014

Hydrology & Hydraulics Report

General

This is the Final Hydraulic Report for the proposed San Francisquito Creek Bridge replacement. The new bridge number is 35-0348, the project is located at PM 0.01 along Route 101, in San Mateo County. The evaluation is based upon the following:

1. General Plans dated 11/5/2014, with abutment, pier and deck details dated 10/9/2014 from Office of Bridge Design West, Bridge Design Branch 16
2. General Plans for Retaining Wall A, B & C, dated 10/9/2014
3. Survey data from the Preliminary Investigations North, dated 3/22/2009
4. Bridge Inspection Reports (BIR's)
5. Hydraulic Review Technical Memorandum, prepared by HDR, dated 8/03/2010
6. Final Report of San Francisquito Creek Development and Calibration /Verification of Hydraulic Model, prepared by Noble Consultants, Inc for the US Army Corps of Engineers, dated 4/17/2009
7. FEMA study for City of East Palo Alto in the County of San Mateo, California, dated 8/13/1999
8. FIRM (Flood Insurance Rate Map), Community Panel Number 060708-0001 B, dated 8/23/1999
9. FIRM (Flood Insurance Rate Map), Community Panel Number 06085C-0030 H, dated 5/18/2009 for Santa Clara County
10. HEC-RAS data provided from HDR Engineering Inc, dated 6/14/2010

Notes

This report supersedes all previous reports for this project.

This report provides elevations in both NGVD29 and NAVD88 datums; The elevations for the bridge plans provided by Branch 16 Structure Design are based on the NGVD29 datum, while the hydraulic model provided by HDR Engineering is based on the NAVD88 datum. The structure elevations were converted to NADV88 by adding 2.70 feet to correlate with the existing channel data and HEC RAS model provided by HDR. Based on the NGS/NOAA/Vertcon website (http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl), the orthometric height conversion factor to determine the datum shift between the NGVD29 and NAVD88 datums at the project site is 2.700 feet. The factor of 2.700 ft is added to the NGVD29 elevations to determine the NAVD88 elevations. Please verify datum references to the Final Design Plans and make elevation adjustments as required.

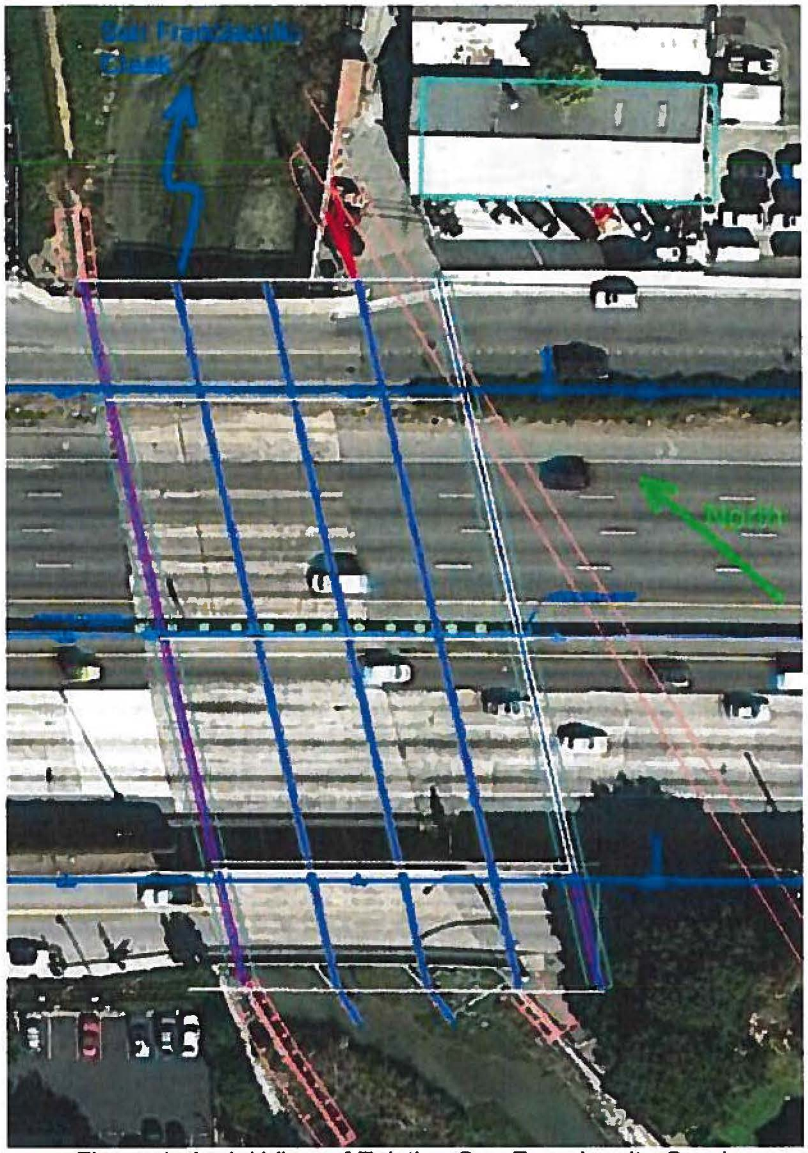


Figure 1: Aerial View of Existing San Francisquito Creek Bridge with Proposed Bridge Superimposed

Existing San Francisquito Creek Bridge (Br. No. 35-0013)

The existing San Francisquito Creek Bridge (Br. No. 35-0013) is a three-span structure, built in 1931 and widened in 1957, including the frontage road, East Bayshore Road. The frontage road along the upstream side, West Bayshore Road, has a separate deck but the substructure is continuous. It is a combination of reinforced concrete (18) girders with a reinforced concrete deck widening on each side, all supported on reinforced concrete (13) pile bents that have been walled in (girder portion) and reinforced concrete RC pier walls founded on reinforced concrete piles at the slab portion. It has a length of 83 feet and a total width of 180 feet. The NBIS Item 113 code is 5, "Bridge foundations determined to be stable for assessed or calculated scour condition. Scour is determined to be within the limits of footing or piles".

The existing bridge, the existing channel both upstream and downstream from the project site and numerous local structures upstream of the project are all considered to be undersized in relation to the 100-year discharge for the SanFrancisquito Creek watershed. There are numerous reports of flooding occurring in the neighborhoods upstream of the project site for discharges less than the 100-year event. This flooding is primarily due to the size of the natural channel, the encroachment of residential parcels and undersized local structures. The SFCJPA is proposing to modify the channel, both upstream and downstream, to increase the capacity, although it is not known when these projects will be constructed. The existing West Frontage Road bridge also has a history of debris related issues. The Santa Clara Valley Water District has placed two Bridgeshark debris deflectors immediately upstream of the debris fins at Pier 2 and Pier 3 walls, and have been known to temporarily park debris removal equipment nearby for the quick, efficient removal of debris that becomes caught at the bridge. This debris can cause backwater effects and flood low lying parcels upstream of the site.

Based on the HEC-RAS model, the water surface elevation for both the 100-year discharge and the current channel capacity encroach upon the soffit of the existing structure, potentially causing pressure scour and backwater effects to occur. There may also be some minor flooding between the West Frontage Road and the Route 101 Mainline structures due to the gap between the two structures.

Proposed San Francisquito Creek Bridge (Br. No. 35-0348)

District 4 proposes to replace the existing San Francisquito Creek Bridge and both frontage road structures with a single structure featuring separate decks built on common abutment and pier layouts and featuring a 3-foot wide gap between the deck sections of the West Frontage Road and Route 101. To increase the channel capacity to match that of the proposed future channel improvements, the bridge length will be extended to the south of the existing bridge to conform the San Francisquito Creek channel improvement plans by the San Francisquito Creek Joint Powers Authority (SFCJPA). The new bridge will be a CIP/RC slab bridge with four spans. The 3 northern spans will be approximately 30.9 feet each while the southern span will be approximately 27.3 ft, center-to-center for a total structure length of approximately 125 feet. The width of the West Bayshore deck will be about 41 feet, while the Highway 101 and East Bayshore deck will be about 200 feet in width. The pier wall width is 1'-4".

The southern span will be blocked off by retaining walls at both the upstream and downstream ends, confining channel flows to the three northern spans until the proposed channel improvements have been completed. Even with the increased waterway opening of the new four-span bridge and the channel improvements, it is still anticipated that the water surface elevation for the 100-year discharge will impact the soffit of the new structure. Due to various issues such as the proximity of the San

Francisco Bay and its tidal influence including the effects of future sea level rise, and the established roadway profile and vertical clearances along the mainline Route 101, the new structure will not meet the recommended minimum soffit elevation. The recommended minimum soffit elevation is based on the calculated water surface elevation for either the 50-year or 100-year discharges with special consideration for debris passage. While the recommended soffit elevation will not be met, there are no significant flood concerns due to the configuration of the new structure. There may be some minor flooding in the gap between the two proposed structures, and there may be some minor increase in the upstream water surface elevation, but this increase should be retained within the channel of proposed upstream channel improvements. Debris will also continue to be an issue at this location irrespective of the minimum soffit elevation.

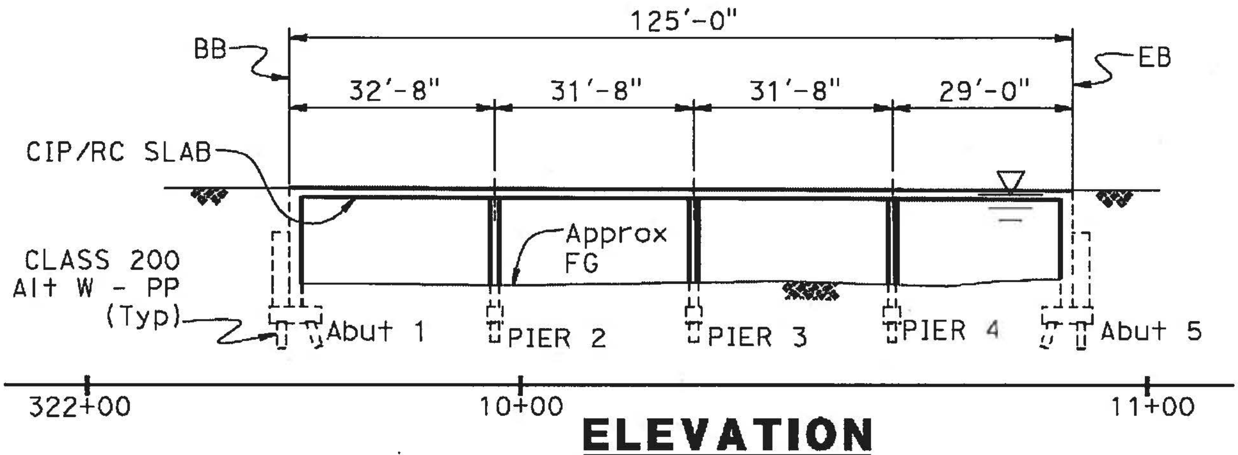


Figure 2: Elevation View of Proposed San Francisquito Creek Bridge

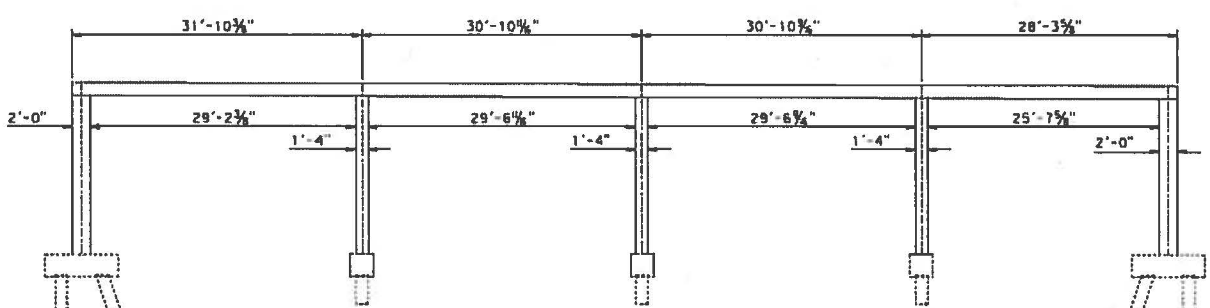


Figure 3: Proposed San Francisquito Creek Bridge, Normal to Channel Details

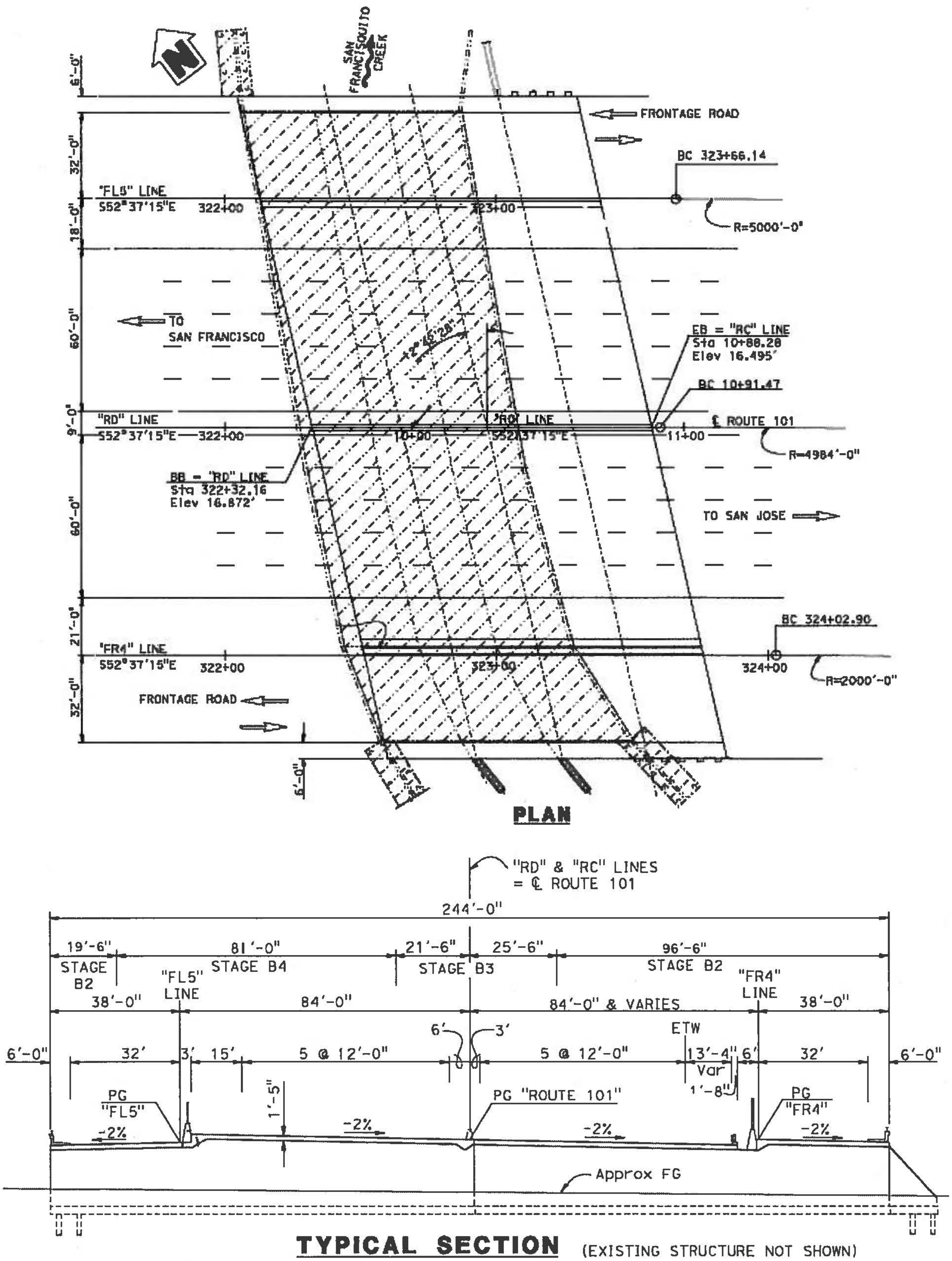


Figure 4: Plan View and Typical Section of Proposed San Francisquito Creek Bridge

Interim Configurations

It is possible that the new bridge will be constructed prior to the completion of the upstream and downstream channel improvements. In this interim situation the southern span, Span 4, of the new structure will be blocked off with Soldier Pile Retaining Walls at both ends. Wall C will be located on the western, upstream side of the structure and Wall B will be located on the eastern, downstream side of the structure. It will also be necessary to construct a third Soldier Pile Wall, Wall A, along the channel downstream of Pier 4. The purpose of Wall A is to retain embankment fills along the southeastern quadrant of the project, until such time as the channel improvements are implemented and the fourth span is opened. Wall A will be roughly parallel to the Pier 4 layout, with a slight skew of approximately 5°, compared with Pier 4 layout, extending toward the center of the channel to a point where it intersects the existing vertical channel wall upstream from the existing 96" outfall. Wall A is proposed to be a steel H-beam wall with wood lagging attached to the channel-side flange of the H-beams. RSP with adequate filter material will be placed at the base of the wall to protect against potential scour and erosion. Based on FHWA HEC-23 guidelines, the RSP to be used at Wall A was estimated to be a minimum 2-foot thick layer of Class #1 Backing with Class #8 RSP Fabric as the filter material. The RSP and filter material are temporary, and will be removed along with Wall A once the final channel improvements are implemented. Both the wall design and the RSP will increase the roughness of the channel surface, as well as slightly impede the flow. Manning's roughness coefficients were raised to 0.050 at the location of the RSP and wall. The effects are minimal, and overall, this configuration will be an improvement when compared to the existing channel configuration.

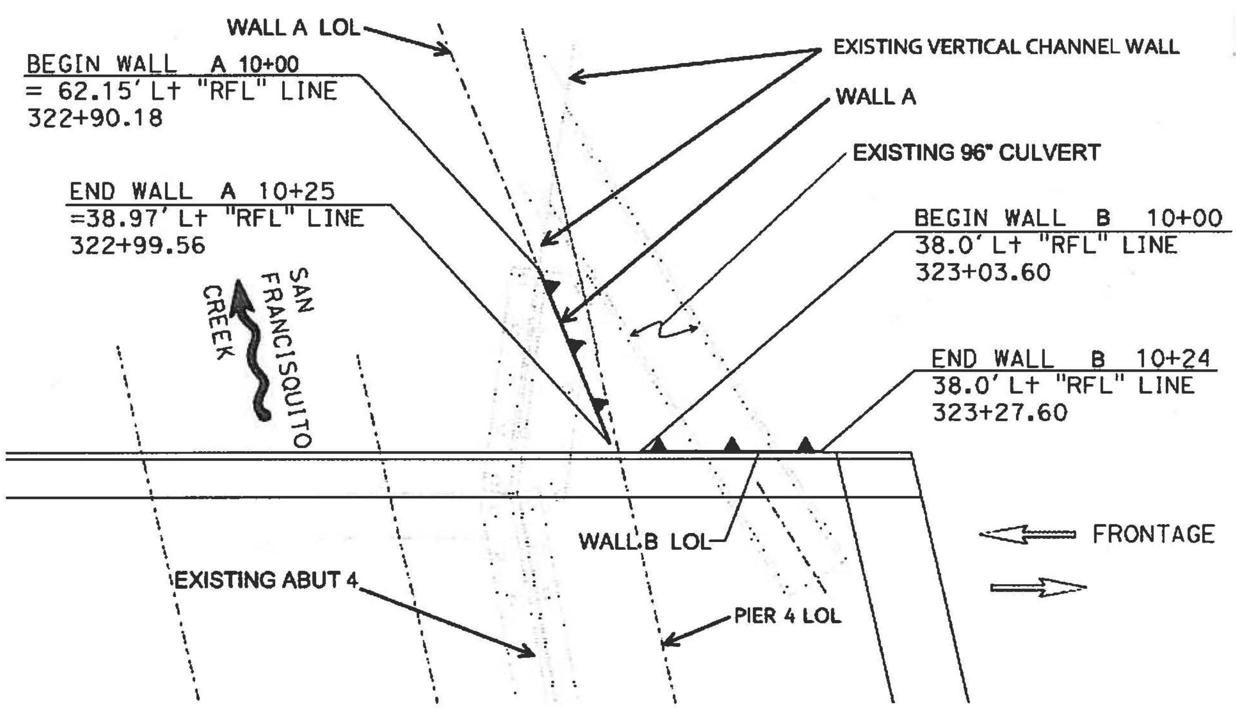


Figure 5: Wall A, Pier 4 and Existing Wall Layout, Plan View

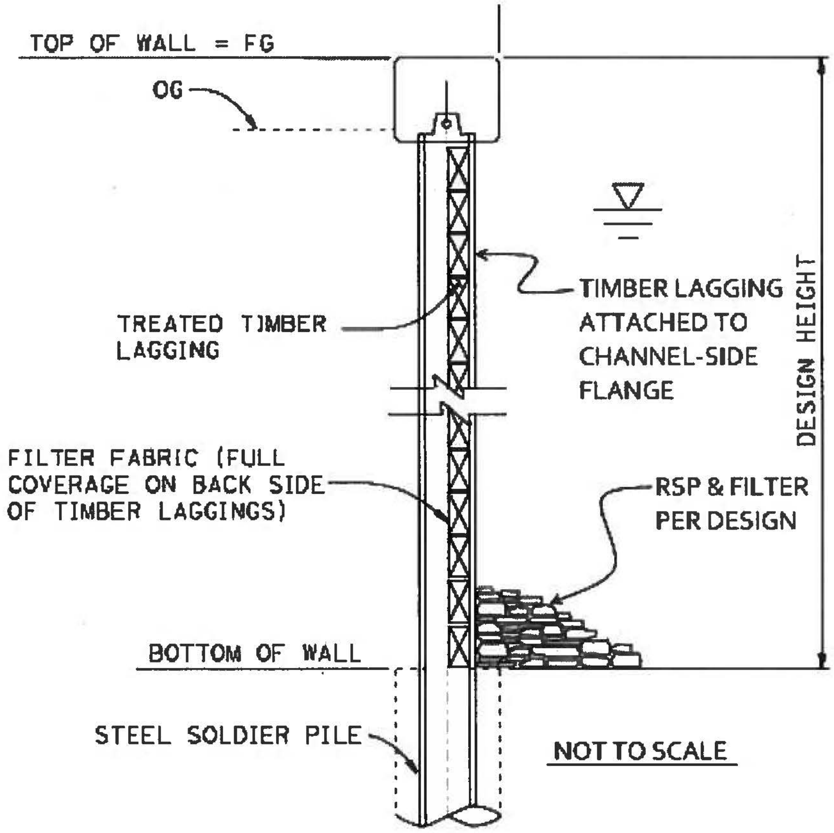


Figure 6: Wall A Details

There will also be a temporary interim condition due to the staged construction of the bridge itself. During construction, the channel configuration will be a mix of the existing structure and the proposed configuration with the blocked southern span. During this temporary configuration, much of the flow through the third span of the proposed structure will be blocked by the roadway bed to the south of the existing southern abutment. While this will reduce the overall capacity of the proposed project for the duration of the construction, the capacity during construction, approximately 7700 cfs, will still be roughly equivalent to the capacity of the current configuration. To maximize the interim capacity during the rainy season, generally from October 15 through April 15, no falsework or other obstructions outside of scour and debris collection countermeasures should remain in the channel beneath the structure. During the dry season when in-channel work will be allowed, the contractor should provide some means of diverting discharges through the site.

Due to debris concerns at the project location, it is likely that debris could become caught on the piers. This debris could reduce the waterway area reducing conveyance and cause an increase in the water surface elevation upstream of the project. Due to the location under the structure, these areas cannot be readily monitored and effective, timely debris removal would be difficult during even typical winter flows. Therefore it is strongly recommended to provide a debris control structure at the upstream end of the project. This debris control structure should allow the capture, observation and periodic removal of debris so as to maximize conveyance and minimize debris blockage which may cause storm water to back up

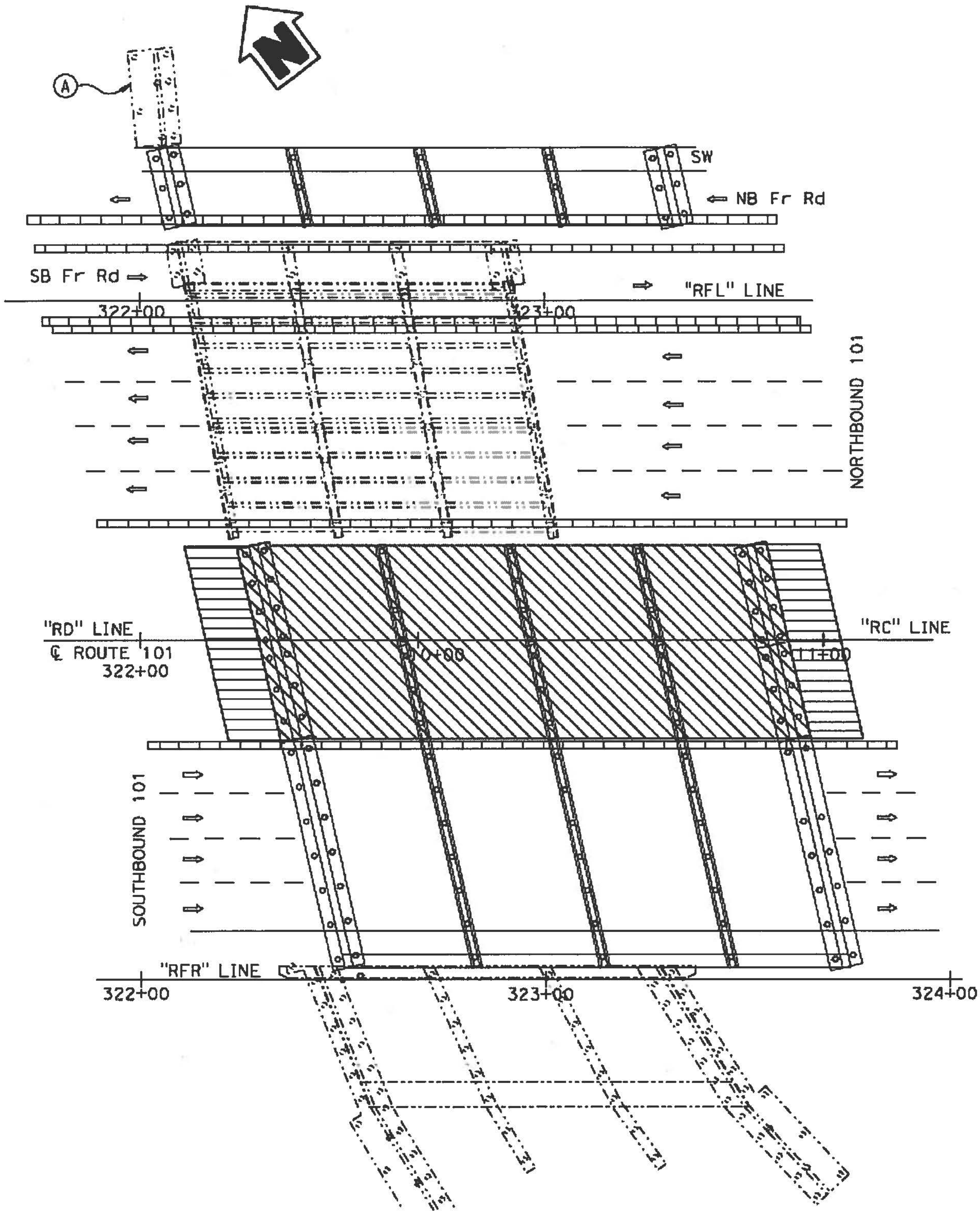
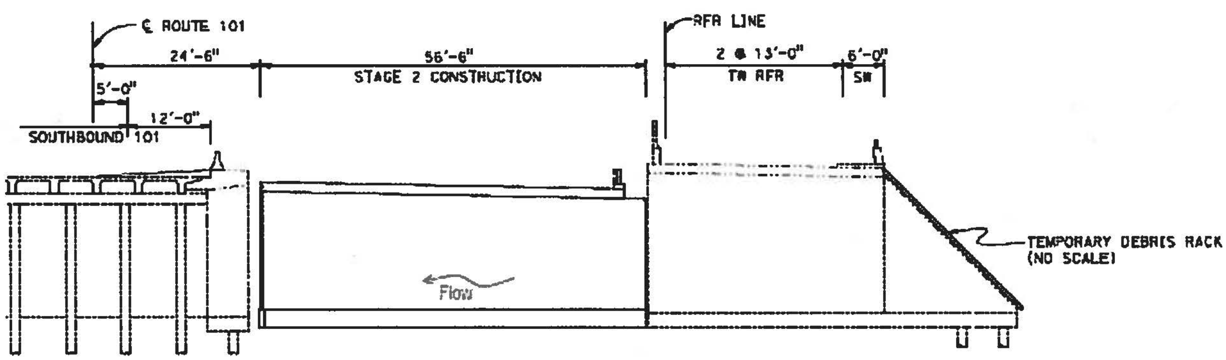


Figure 7: Stage 3 Plan View Illustrating the Offset Pierwalls.

upstream of the project. Some alternatives can be found in the Federal Highway Administration (FHWA) manual, *Hydraulic Engineering Circular No.9 (HEC 9), Debris Control Structures; Evaluation and Countermeasures*; Third Edition, October 2005 (http://www.fhwa.dot.gov/engineering/hydraulics/pubs/04016/hec09.pdf). Based on the reduced width of some openings between the existing and proposed portions found during the different construction stages, it is suggested that a "Debris Rack for Culverts" would be an appropriate type of alternative for this situation. A debris rack could be attached to either the sloping upstream ends of the existing pier walls or to the superstructure with the toe of the debris rack resting on the channel bed. The design should keep any large debris from going around, under or over the debris rack and entering the waterway under the bridge.

The design should have a maximum horizontal spacing of 36" between the vertical members. A minimum horizontal spacing of 18" should be sufficient for fish passage and debris capture. Assuming a 50% blockage, vertical members should be capable of withstanding hydrostatic forces of approximately 2000 pounds each. It is estimated that a design velocity of 8.5 feet per second should be used at this location. Vertical spacing of the lateral support members, if needed, should have a minimum spacing of 24", and be set back from the face of the vertical members to facilitate debris removal. The debris rack should be installed at a 1:2 (horizontal:vertical) slope (or flatter), with the toe of the debris rack oriented upstream from the top of the debris rack. The National Marine Fisheries Service guide, *Anandromous Salmonid Passage Facility Design* may also be consulted for design guidance and information (http://www.habitat.noaa.gov/pdf/salmon_passage_facility_design.pdf).



Temporary Debris Rack Typical Location at Upstream End of Structure
Not To Scale

Figure 8: Elevation View with a Typical, Suggested Location for the Temporary Debris Rack.

Maintenance of the debris rack should be handled as required to keep large debris from being conveyed beneath the structure. For this project, large debris would be considered debris in excess of 36" inches in any dimension. All debris should be removed and the debris rack inspected within one day prior and after, and periodically during a storm event that would be expected to cause significant flows within the channel. Significant flows could be considered flows that are expected to cause the water surface of the channel to rise to a depth of more than 5 feet immediately upstream of the bridge. Debris should also be removed and the debris rack inspected for damage after each significant flow event. Debris accumulation should not be allowed to exceed 33% blockage of the debris rack at any time or cause stream flow to overtop the banks of the creek due to debris accumulation at the site.

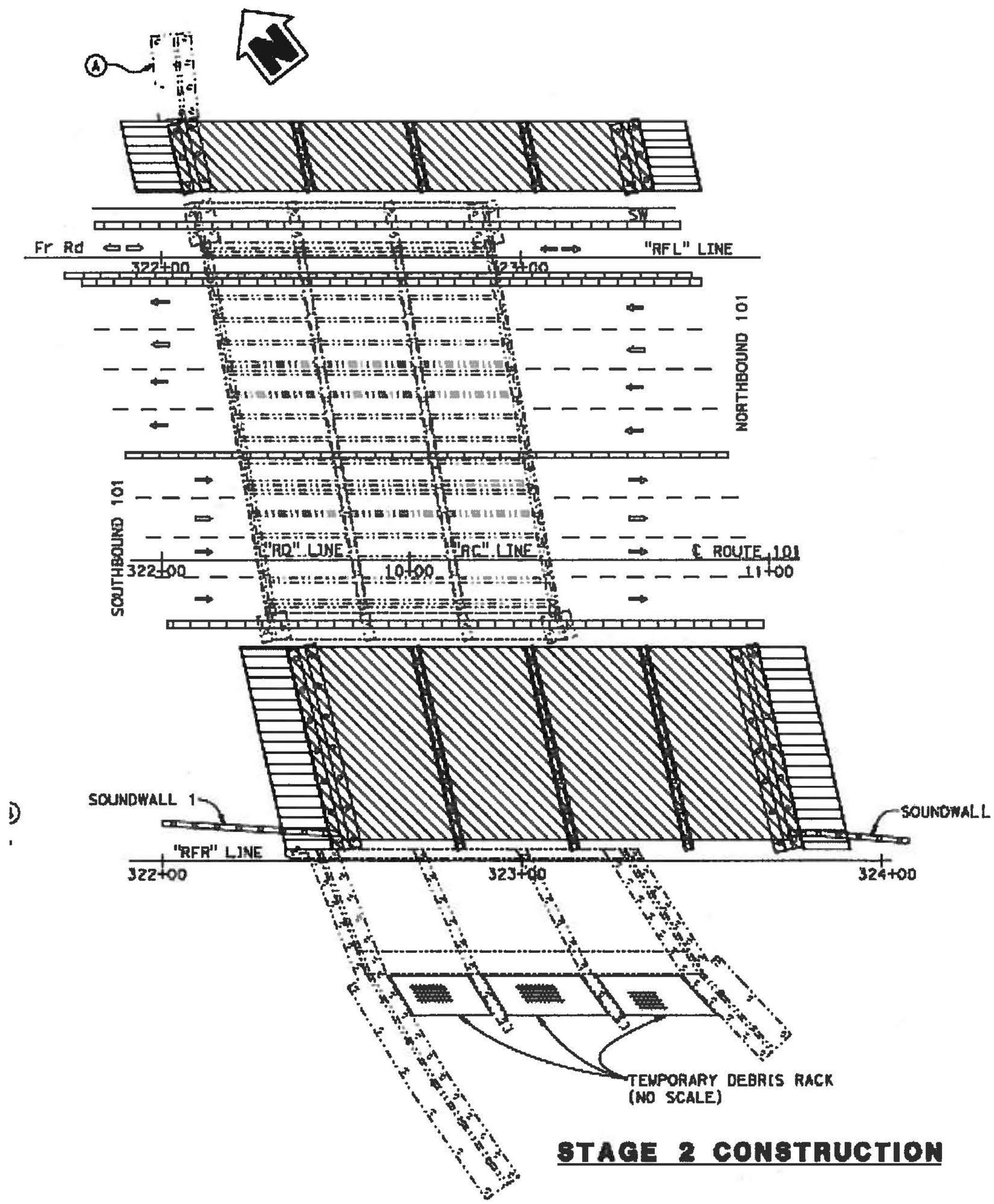


Figure 9: Plan View with a Typical, Suggested Location for the Temporary Debris Rack.

Basin

The San Francisquito Creek watershed encompasses about 45 square miles starting in the rugged hillsides of the Santa Cruz Mountains and extending to the San Francisco Bay in San Mateo County, California. Two major tributaries of San Francisquito Creek are Bear Creek and Los Trancos Creek. However, their confluences are far from the creek mouth and the project site. The lower reach of the stream begins at the base of Searville Dam at Stanford University and discharges water into the San Francisco Bay approximately 2.5 miles south of the Dumbarton Bridge. The climate in San Mateo County is moderate; the average temperature ranges from 48^{0}F in January to 67^{0}F in July and the average humidity is 75% to 80% in summer and winter respectively. The average yearly precipitation is 18 inches, varying from year to year with about 90% occurring during the rainy season, November to March.

Streambed

The soils in this area are alluvial and sedimentary deposits; it is a mixture of clay, loam, sand and gravel. For more information on the channel bed composition and its depths, please refer to the Log of Test Borings provided by the Foundation Investigation Branch, Division of Geotechnical Services for this project.

Discharge

There has been a lengthy history of flooding on San Francisquito Creek, largely due to the existing structures, many of which cannot convey higher flows, along with low levees which do not contain the higher water surface elevations. To reduce local flooding, a 96-inch storm drain was built in 1971 to pickup overland flow from a residential area upstream of US Hwy 101. The outfall is located at downstream of the East Bayshore Frontage Road Bridge, and discharges into San Francisquito Creek. Santa Clara Valley Water District constructed/improved the levees along San Francisquito Creek in 2004 for flood control purposes, but did not solve the flooding problem. There have been several different studies to determine the flow capacity for the existing structures over the San Francisquito Creek, and the latest study is the Final Report of San Francisquito Creek Development and Calibration/Verification of Hydraulic Model, prepared by Noble Consultants, Inc for the US Army Corps of Engineers dated 4/17/2009. According to this report, most existing structures including the San Francisquito Creek Bridge at Route 101 "are incapable of carrying the 100-year flow". The peak flow rate at US Hwy 101 is estimated at 9,300 cfs for 100-year storm. Caltrans had a meeting with all local agencies, including the San Francisquito Creek Joint Powers Authority (SFCJPA) to finalize the San Francisquito Creek improvement plans. In an agreement, the design discharge of Q_{100} will be 9,300 cfs. The Joint Powers Authority (SFCJPA) agreed to make improvements throughout the channel to meet the design discharge (9,300 cfs). Caltrans will replace the existing San Francisquito Creek Bridge and the Bayshore Frontage Bridges with a single structure. One cell along the southern side (Span 4) of the new bridge will initially be blocked until the final improvements for the channel are completed.

Tidal effects

San Francisquito Creek discharges water into the lower end of the San Francisco Bay. Referring to the Final Report for San Francisquito Creek Development and Calibration/Verification of Hydraulic Model prepared by Noble Consultants, Inc for the U.S Army Corps of Engineers; the Mean Higher High Water (MHHW) at the elevation of +7.1 feet NAVD88 (4.4 feet NGVD29) and the highest tidal stage at 9.3 feet NAVD 88 (6.6 feet NGVD29) on February 1998 were recorded at the nearest tidal station (Redwood City-Station ID: 9414523). The latest FIRM (Flood Insurance Rate Map), dated 5/18/2009 for Santa Clara County shows the 100-year flood level in the affected areas downstream of the site is 11.0 feet NAVD88 (8.3 feet NGVD29). However, the recommendation in the Hydraulic Review Technical Memorandum prepared by HDR, the tidal stage at the creek mouth will be 12.52 feet NAVD88 (9.82 feet NGVD29) by adding 26 inches Sea Level Rise to 10.35 feet NAVD (7.65 feet NGVD29) from the USACE 2005 study. This water height will be used as the downstream boundary control in the HEC-RAS study.

HEC-RAS Model

HEC-RAS Version 4.1.0 – a streambed analysis computer program was used for the water modeling and bridge scour calculations. The model for this project originated from HDR, Inc, dated 6/14/2010. Caltrans Structure Hydraulics Office has made minor modifications to the HDR model by interpolating new cross-sections in the vicinity of the proposed replacement structure at the US HWY 101 Bridge and the interim Wall A locations. The Manning's roughness coefficients (0.027 to 0.055) were taken from 2009 field inspection reports. Channel migration and moderate debris were considered for the scour calculations. Channel degradation was considered to be negligible for the site.

Velocity

Based on the estimated channel discharge at the proposed structure, the average velocity will range from 5.3 fps – 6.5 fps. Under the Interim conditions, average velocities will range from 5.5 fps – 9.3 fps in the immediate vicinity of the proposed structure and Wall A. At the upstream end of the structure where the water will impact the pierwalls at a slight skew, the maximum average velocity for the differing scenarios is approximately 6.5 fps.

Waterway

The structures are required to provide a waterway area, which has sufficient capacity to pass the discharge plus adequate freeboard per section 821.3 CALTRANS Highway Design Manual. The minimum required waterway for the proposed structure is 1750 square feet above the finished grade elevation.

Drift

Bridge maintenance records are available for the existing San Francisquito Bridge (Br. No. 35-0013). According to these records, moderate to large drift have been found around various piers and debris removal has been recommended several times. The channel was clear without any drift during the field investigation on May 1, 2009. There are existing debris spinners upstream of the bridge to keep the drift away from the piers that will affect the water level in the channel. To compensate for this issue, if the debris spinners are reinstalled, then they will be assumed to be permanent floating debris in the HEC-RAS model. Caltrans design criteria recommends that all substructural elements of new structures should be designed to be stable under the anticipated, potential scour without reliance upon scour countermeasures. Debris width at the piers was assumed to add an additional 1 foot of width to each side of the piers, for a total width of 3'-4".

Stage and Minimum Recommended Soffit Elevation

The calculated 100-year water stage elevation is 17.9 feet NAVD88 (15.2 feet NGVD29). and the minimum recommended soffit elevation at the upstream side of the proposed structure is 17.9 feet NAVD88 (15.2 feet NGVD29). Due to project constraints, both the existing and the proposed structure do not meet the recommended minimum soffit elevation, therefore the structure depth should be minimized and design should consider a soffit elevation no lower than that of the existing structure. Buoyancy should be considered in the deck design.

The recommended minimum soffit elevation is based on the calculated water surface elevation for either the 50-year or 100-year discharges with special consideration for debris passage. While the recommended soffit elevation will not be met, there are no significant flood concerns due to the configuration of the new structure. There may be some minor flooding in the gap between the two proposed structures, and there may be some minor increase in the upstream water surface elevation, but this increase should be retained within the channel of proposed upstream channel improvements. Debris will also continue to be an issue at this location irrespective of the minimum soffit elevation.

Bridge Skew and Hydraulic Skew

The bridge skew is about 14 degrees and the hydraulic skew is less than 10 degrees based on the new channel reconfiguration and the bridge replacement.

HEC-RAS Plan: Wall A Locations: User Defined Profile: 100-Year

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Vel Chnl	Flow Area	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft/s)	(sq ft)	
SF Creek	R1	8027.550	100-Year	9300.00	3.56	19.28	15.72	5.41	1728.50	0.25
SF Creek	R1	7883.61*	100-Year	9300.00	3.05	19.09	16.04	5.90	1575.85	0.28
SF Creek	R1	7880.61	100-Year	9300.00	3.05	18.92	15.87	6.58	1414.23	0.29
SF Creek	R1	7878.62		Bridge						
SF Creek	R1	7836.11	100-Year	9300.00	1.81	18.60	16.79	6.49	1432.72	0.29
SF Creek	R1	7834.61		Bridge						
SF Creek	R1	7627.808	100-Year	9300.00	1.81	17.49	15.68	6.97	1334.38	0.32
SF Creek	R1	7609.61	100-Year	9300.00	1.72	17.23	15.51	7.40	1256.76	0.34
SF Creek	R1	7597.61	100-Year	9300.00	1.66	17.12	15.46	7.08	1313.85	0.33

Table 1: HEC-RAS Output for Interim Condition, Wall A, Elevations using NAVD88 Datum.

HEC-RAS Plan: Final 16" walls Locations: User Defined Profile: 100-Year

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Vel Chnl	Flow Area	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft/s)	(sq ft)	
SF Creek	R1	8027.550	100-Year	9300.00	3.56	18.08	14.52	5.91	1573.57	0.29
SF Creek	R1	7883.61*	100-Year	9300.00	3.05	17.83	14.78	6.51	1427.70	0.33
SF Creek	R1	7880.61	100-Year	9300.00	3.05	17.93	14.88	5.43	1714.28	0.25
SF Creek	R1	7878.62		Bridge						
SF Creek	R1	7836.11	100-Year	9300.00	1.81	17.80	15.99	5.33	1743.67	0.24
SF Creek	R1	7834.61		Bridge						
SF Creek	R1	7627.808	100-Year	9300.00	1.81	17.26	15.45	5.35	1736.99	0.25
SF Creek	R1	7418.670	100-Year	9300.00	0.70	17.22	16.52	5.71	2081.06	0.26

Table 2: HEC-RAS Output for Proposed Final Configuration, 4 spans, Elevations using NAVD88 Datum.

Scour and Channel Degradation

No channel cross-section records were available until 1993, with a second measurement taken in 2003. Preliminary Investigations – North performed a channel survey on 3/22/2009. Under normal flows, the material in channel bed recharges by itself by tidal effect. The channel appears laterally stable and based on historical cross-sections, future channel degradation is assumed to be negligible. Contraction scour at the proposed structure is also considered to be negligible. The total local pier scour depth is estimated and based on the cross-sections in the HECRAS model. Moderate debris loading is considered in the scour calculation by adding a debris width of 1.67 feet to each pier, for a total width of 3.0 feet. Local Pier Scour was calculated within HEC-RAS using the CSU equation. The final supported elevation for all pier and abutment foundations should be consulted with the Geotechnical Branch. At the piers, the anticipated short term local scour depth is 7.7 feet, reaching an elevation of -4.65 feet NAVD88 (-7.35 feet NGVD29). Due to retaining walls upstream of the structure, integral with the abutments, abutment scour is anticipated to be minimal; however there will likely be some scour due to the hydraulic skew at the upstream end of the project. The top of footing elevation for both abutments should be placed below elevation -0.30 feet NAVD 88 (-3.0 feet NGVD 29)

Bank Protection

Considerable bank erosion at the embankments may occur due to the soil composition. The District is to recommend bank protection for channel embankments and roadway approaches, if required.

Flood Plain Encroachment

The proposed project is located on the boundary between the cities of Palo Alto and East Palo Alto, and is in the flood hazard area inundated by the 100-year flood with two different zonings. The first zoning is "ZONE A, No base flood elevation determined" as shown on the East Palo Alto City, California Flood Insurance Rate Map (FIRM), Community-Panel Number 060708-0001 B, and dated August 23, 1999. The second zoning is "ZONE AE, Base flood elevation determined" as shown on the Santa Clara County, California Flood Insurance Rate Map (FIRM), Community Panel Number 06085C-0030 H, and dated 5/18/2009. The current 100-year flood elevation is at 11.0 feet NAVD (8.3 feet NGVD29) as shown on Santa Clara County 2009 flood map.

Summary Information for the Bridge Designer

Below is a summary of key design parameters based on the hydrology and hydraulic analysis performed for this structure:

All calculated elevations in this report are based on the General Plans from the Office of Bridge Design West, Branch 16, dated 11/5/2014 and the HEC-RAS model provided by HDR. Elevations are provided for both the NGVD29 datum as well as the NAVD88 datum.

HYDROLOGIC SUMMARY Bridge Number: 35-0348			
Drainage Area: 45 square miles			
	Design Flood	**Base Flood**	**Overtopping**
Frequency (yrs)	100-Year	100-Year	N/A
Discharge (ft^3/s)	9,300	9,300	>10,000
Water Surface Elevation at Bridge (ft)	17.9 NAVD88 15.2 ft NGVD29	17.9 NAVD88 15.2 ft NGVD29	Under pressure flow, no freeboard
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

Minimum Recommended Soffit Elevation	17.9 ft NAVD88 (15.2 ft NGVD29)
Potential Scour Elevation at Abutments	-0.30 ft NAVD88 (-3.0 ft NGVD29)
Potential Scour Elevation at Piers	-4.65 ft NAVD88 (-7.35 ft NGVD29)
Recommended Waterway Opening	1,750 ft^2
Average Velocity, 100-year discharge	5.4 fps

All calculated elevations in this report are based on the General Plans from the Office of Bridge Design West, Branch 16, dated 11/5/2014 and the HEC-RAS model provided by HDR. . Elevations are provided for both the NGVD29 datum as well as the NAVD88 datum.

Long Term Scour Depths

Support Location	Degradation Scour Depth (ft)	Contraction Scour Depth (ft)
All Supports	N/A	N/A

Scour Data (Elevation and Depth)

Support Location	Long Term Scour Elev (ft)	Short Term (Local) Scour Depth (ft)
All Piers	N/A	7.7
Abutments	N/A	3.35

Figure 5.15. Steel debris rack in urban area.

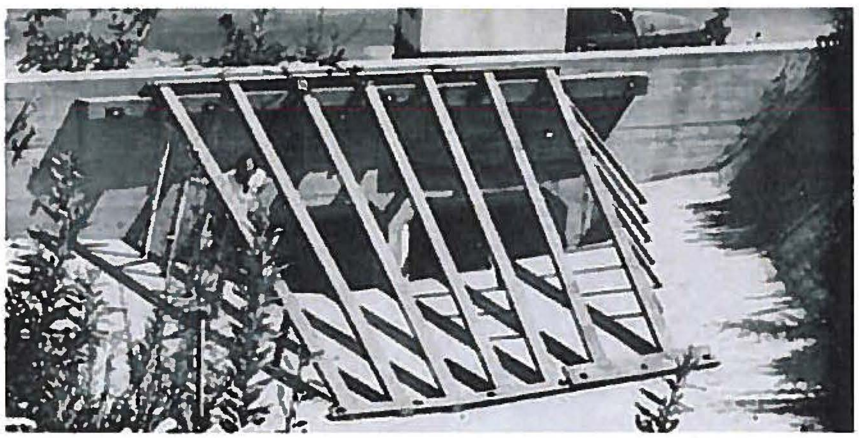


Figure 5.21. Steel grill debris rack with provision for cleanout afforded by concrete paved area in foreground.

Figure 5.22. Steel grill debris rack on slope mitered culvert entrance.

Figure 10: FHWA HEC 9, Pictures of Typical Debris Racks.

4.6 HYDRAULIC LOADING ASSOCIATED WITH DEBRIS ACCUMULATION

There are three steps for computing the hydraulic loading on a bridge structure with debris accumulation. The first step is to define the geometry of the debris accumulation using the procedures and recommendations presented in Chapter 3 of this manual. The second step is to compute the flow hydraulics through the bridge structure using the procedures and recommendations presented in the previous sections of this chapter. The last step is to compute the hydrodynamic loads using the hydraulic characteristics associated with the presence of the debris accumulation and the following equations and general procedure developed by Parola[49].

The hydrodynamic drag force is based on the general form of the drag equation and the drag coefficient relationship developed from a model study investigation by Parola at the University of Louisville[49].

$$F_D = C_D \gamma A_D \frac{V_r^2}{2g} \tag{4.1}$$

where:

F_D	=	Drag force, N (lbs)
C_D	=	Drag coefficient, see Tables 4.1 and 4.2
γ	=	Specific weight of water, N/m^3 (lbs/ft^3)
A_D	=	Area of wetted debris based on the upstream water surface elevation projected normal to the flow direction, m^2 (ft^2)
V_r	=	Reference velocity, see discussion in Subsection 4.3.3.1, m/s (ft/s)
g	=	Acceleration of gravity, 9.81 m/s^2 (32.2 ft/s^2)

Drag coefficient for debris on piers is provided in Table 4.1 and for debris on superstructures in Table 4.2.

Table 4.1. Drag Coefficient for Debris on Piers.

Value of B	Value of F_r	C_D
$B < 0.36$	$F_r < 0.4$	1.8
$B < 0.36$	$0.4 < F_r < 0.8$	$2.6 - 2.0F_r$
$0.36 < B < 0.77$	$F_r < 1$	$3.1 - 3.6B$
$B > 0.77$	$F_r < 1$	$1.4 - 1.4B$

Table 4.2. Drag Coefficient for Debris on Superstructure.

Value of B	Value of F_r	C_D
$B < 0.33$	$F_r < 0.4$	1.9
$B < 0.33$	$0.4 < F_r < 0.8$	$2.8 - 2.25F_r$
$0.33 < B < 0.77$	$F_r < 1$	$3.1 - 3.6B$
$B > 0.77$	$F_r < 1$	$1.4 - 1.4B$

Figure 11: FHWA HEC 9, Typical Hydrodynamic Force Equations & Variables.

The drag coefficient as provided in these tables is related to the blockage ratio and Froude number as defined below.

$$B = \frac{A_d}{A_d + A_c} \qquad (4.2)$$

where:

B	=	Blockage ratio
A_d	=	Cross-sectional flow area blocked by debris in the contracted bridge section, m^2 (ft^2)
A_c	=	Unobstructed cross-sectional flow in the contracted section, m^2 (ft^2)

$$F_r = \frac{V_r}{\sqrt{gy_r}} \qquad (4.3)$$

where:

Fr	=	Froude number
V_r	=	Reference velocity, see discussion in Subsection 4.3.3.1, m/s (ft/s)
g	=	Acceleration of gravity, 9.81 m/s^2 (32.2 ft/s^2)
y_r	=	Average flow depth corresponding with the reference velocity, m (ft)

The total force on the structure that is caused by the hydrostatic pressure difference can be approximated as:

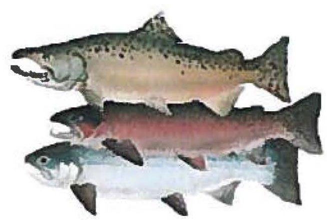
$$F_h = \gamma(h_{cu}A_{hu} - h_{cd}A_{hd}) \qquad (4.4)$$

where:

F_h	=	Horizontal hydrostatic force on area A_h, N (lbs)
γ	=	Specific weight of water, N/m^3 (lbs/ft^3)
h_{cu}	=	Vertical distance from the upstream water surface to the centroid of area A_{hu}, m (ft)
A_{hu}	=	Area of the vertically projected, submerged portion of the debris accumulation below the upstream water surface, m^2 (ft^2)
h_{cd}	=	Vertical distance from the downstream water surface to the centroid of area A_{hd}, m (ft)
A_{hd}	=	Area of the vertically projected, submerged portion of the debris accumulation below the downstream water surface, m^2 (ft^2)

Figure 12: FHWA HEC 9, Typical Hydrodynamic Force Equations & Variables.

**ANADROMOUS SALMONID
PASSAGE FACILITY DESIGN**



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FEBRUARY 2008

Figure 13: NOAA Fish Passage Facility Design Manual.

4.8.2 Specific Criteria and Guidelines – Coarse Trash Rack

4.8.2.1 Velocity: The velocity through the gross area of a clean *coarse trash rack* should be less than 1.5 ft/s.

4.8.2.2 Depth: The depth of flow through a *coarse trash rack* should be equal to the pool depth in the *fishway*.

4.8.2.3 Maintenance: The *coarse trash rack* should be installed at 1:5 (horizontal:vertical) slope (or flatter) for ease of cleaning. The *coarse trash rack* design must allow for easy maintenance, considering access for personnel, travel clearances for manual or automated raking, and removal of debris.

4.8.2.5 Bar Spacing: The *fishway* exit *coarse trash rack* should have a minimum clear space between vertical flat bars of 10 inches if Chinook salmon are present, and 8 inches in all other instances. Lateral support bar spacing must be a minimum of 24 inches, and must be sufficiently back set of the *coarse trash rack* face to allow full trash rake tine penetration. *Coarse trash racks* must extend to the appropriate elevation above water to allow easy removal of raked debris.

4.8.2.6 Orientation: The *fishway* exit *coarse trash rack* must be oriented at a deflection angle greater than 45° relative to the direction of river flow.

NMFS Anadromous Salmonid Passage Facility Design February 2008

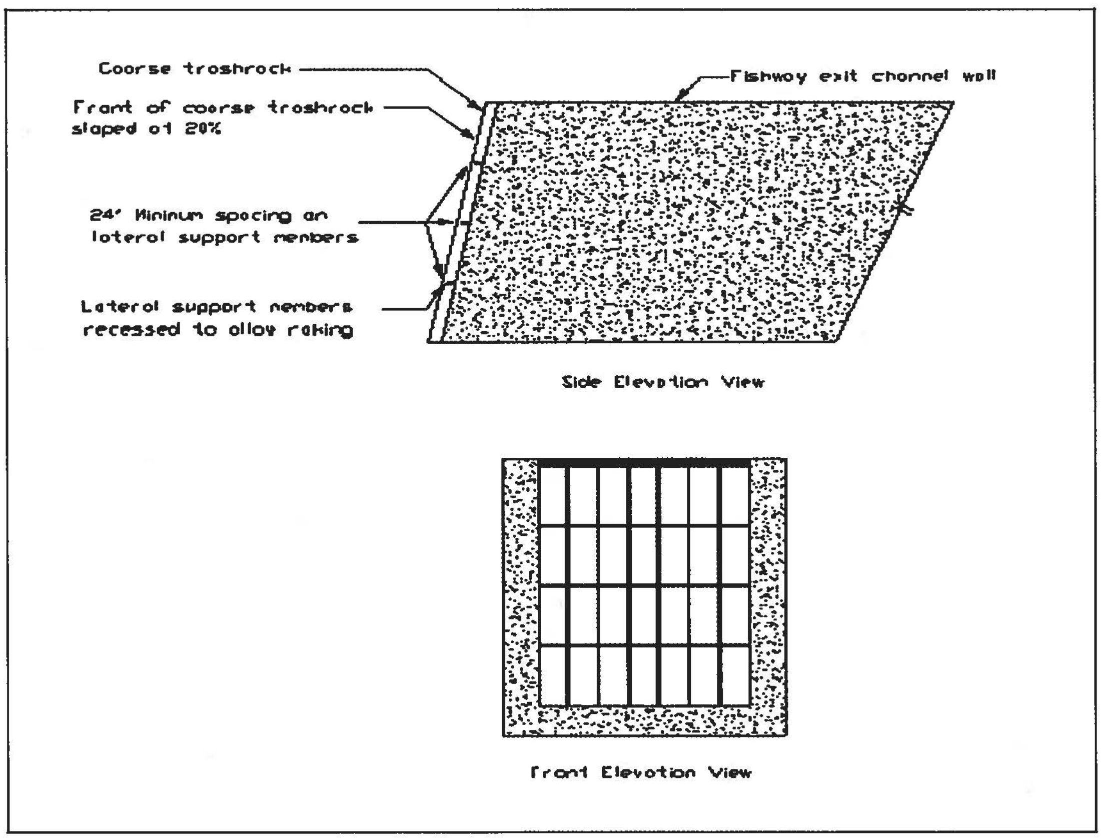

Figure 14: NOAA Fish Passage Facility Design Manual, Criteria & Guidelines (Figure 4-5).