

FOR CONTRACT NO.: 01-475604

INFORMATION HANDOUT

WATER QUALITY

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
WATER QUALITY CERTIFICATION (401)**

PERMITS

**UNITED STATES ARMY CORPS OF ENGINEERS
NON-REPORTING NATIONWIDE 404 PERMIT**

AGREEMENTS

**CALIFORNIA DEPARTMENT OF FISH AND GAME
NOTIFICATION NO.1600-2010-004-R1**

MATERIALS INFORMATION

FOUNDATION REPORT (8/13/08)

FOUNDATION REVIEW (4/2/09)

MINING AND TUNNELING UNIT UNDERGROUND CLASSIFICATION

ROUTE: 01-Hum-36-29.2



Linda S. Adams
Secretary for
Environmental Protection

**California Regional Water Quality Control Board
North Coast Region
Geoffrey M. Hales, Chairman**

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Arnold
Schwarzenegger
Governor

March 3, 2010

In the Matter of
Water Quality Certification

for the

**California Department of Transportation
Highway 36 – Storm Damage Repair (Ridgetop Wall) Project:
WDID No. 1B10007WNHU**

APPLICANT: California Department of Transportation
RECEIVING WATER: Unnamed tributary to Little Larabee Creek
HYDROLOGIC AREA: Eel River Hydrologic Unit (HU) No.111.00
Bridgeville Hydrologic Sub-Area 111.22
COUNTY: Humboldt
FILE NAME: CDOT - Hwy 36, Storm Damage Repair (Ridgetop Wall)
Project

BY THE EXECUTIVE OFFICER:

1. On January 13, 2010, the North Coast Regional Water Quality Control Board (Regional Water Board) received an application from the California Department of Transportation (Caltrans), requesting Federal Clean Water Act (CWA), section 401, Water Quality Certification for activities related to the Highway 36 Storm Damage Repair (Ridgetop Wall) Project (project). The project will cause disturbances to waters of the United States (U.S.) and waters of the State associated with the Eel River Unit No.113.00, and Bridgeville Hydrologic Sub-Area No. 111.22. The Regional Water Board provided public notice of the application pursuant to title 23, California Code of Regulations, section 3858 on January 20, 2010, and posted information describing the project on the Regional Water Board's website. No comments were received.

California Environmental Protection Agency

Recycled Paper

Bridgeville Hydrologic Sub-Area 111.22

Filled or Excavated Area: Permanent impacts: 72 feet² new permanent impacts
Temporary impacts: 200 feet² of temporary construction impacts

Total Linear Impact: Permanent impacts: 12 linear feet of new permanent impacts
Temporary impacts: 100 linear feet of temporary construction impacts

Dredge Volume : None

Latitude/Longitude: 40.4816 N / 123.7339 W

Expiration: March 3, 2015

ACCORDINGLY, BASED ON ITS INDEPENDENT REVIEW OF THE RECORD, THE REGIONAL WATER BOARD CERTIFIES THAT THE CALTRANS – HIGHWAY 36 – STORM DAMAGE REPAIR (RIDGETOP WALL) PROJECT, WDI NO. 1B10007WNHU, AS DESCRIBED IN THE APPLICATION WILL COMPLY WITH SECTIONS 301, 302, 303, 306 AND 307 OF THE CLEAN WATER ACT, AND WITH APPLICABLE PROVISIONS OF STATE LAW, PROVIDED THAT CALTRANS COMPLIES WITH THE FOLLOWING TERMS AND CONDITIONS:

1. This certification action is subject to modification or revocation upon administrative or judicial review; including review and amendment pursuant to Water Code section 13330 and title 23, California Code of Regulations, section 3867.
2. 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 title 23, California Code of Regulations, section 3855, subdivision (b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The validity of any nondenial certification action (actions 1 and 2) shall be conditioned upon total payment of the full fee required under title 23, California Code of Regulations, section 3833, unless otherwise stated in writing by the certifying agency.

4. The Regional Water Board shall be notified in writing each year at least five working days (working days are Monday – Friday) prior to the commencement of ground disturbing activities and major concrete pours, with details regarding the construction schedule, in order to allow staff to be present onsite during installation and removal activities, and to answer any public inquiries that may arise regarding the project.
5. Except as may be modified by any preceding conditions, all certification actions are contingent on: a) the discharge being limited and all proposed revegetation being completed in strict compliance with the Applicant's project description, and b) compliance with all applicable requirements of the Basin Plan.
6. Caltrans shall construct the project in accordance with the project described in the application and the findings above, and shall comply with all applicable water quality standards.
7. Any change in the implementation of the project that would have a significant or material effect on the findings, conclusions, or conditions of this Order must be submitted to the Executive Officer of the Regional Water Board for prior review and written approval.
8. Caltrans shall provide Regional Water Board staff access to the project site to document compliance with this order.
9. Caltrans shall provide a copy of this order and attachments to the contractor and all subcontractors conducting the work, and require that copies remain in their possession at the work site. Caltrans shall be responsible for work conducted by its contractor or subcontractors.
10. All activities and BMPs shall be implemented according to the submitted application and the conditions in this certification.
11. All conditions required by this Order shall be included in the Plans and Specifications prepared by Caltrans for the Contractor. In addition, Caltrans shall require compliance with all conditions included in this Order in the bid contract for this project.
12. BMPs for erosion, sediment and turbidity 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 or sediment discharges to surface water. The BMPs shall be implemented in accordance with the CCSBMPM and all contractors and subcontractors shall comply with the CCSBMPM.

13. Caltrans shall take photos of all areas disturbed by project activities, including all excess materials disposal areas, after rainfall events that generate visible runoff from these areas in order to demonstrate that erosion control and revegetation measures are present and have been installed appropriately and successfully in accordance with the CCSBMPM. A brief report containing these photos shall be submitted within 60 days of the rainfall event that generated runoff from the disturbed areas. In addition, Caltrans shall provide photos of the completed work to the appropriate Regional Water Board staff person, in order to document compliance. Reports shall be provided for each year of construction and a final report shall be provided for the season subsequent to the completion of the project. Additional reports throughout construction and the wet season may be required as requested by Regional Water Board staff.
14. Caltrans shall utilize wildlife-friendly 100% biodegradable erosion control products. Photodegradable synthetic products are not considered biodegradable. Caltrans shall not use or allow the use of permanent erosion control products that contain synthetic (e.g., plastic or nylon) netting or materials. Permanent erosion control products are considered to be products left in place for two years or more or after the project is completed. If Caltrans finds that erosion control netting or products have entrapped or harmed wildlife at the site, the product shall be removed and replaced with wildlife-friendly biodegradable products. Caltrans shall not use or allow the use of soil stabilization products that contain synthetic materials within waters of the United States or waters of the State at any time.
15. The Resident Engineer shall hold on-site water quality permit compliance meetings (similar to tailgate safety meetings) to discuss permit compliance, including instructions on how to avoid violations and procedures for reporting violations. The meetings shall be held at least every other week, and particularly 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 biological monitors assigned to the project, shall be present at the meetings. Caltrans shall maintain dated sign-in sheets for attendees at these meetings, and shall make them available to the Regional Water Board on request.
16. If, at any time, an unauthorized discharge to surface water (including wetlands, rivers or streams) occurs, or any water quality problem arises, the associated project activities shall cease immediately until adequate BMPs are implemented. The Regional Water Board shall be notified promptly and in no case more than 24 hours after the unauthorized discharge or water quality problem arises.

17. 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 Order, shall be allowed to enter into or be placed where it may be washed by rainfall into waters of the State.
18. Water which has come into contact with wet concrete during construction shall be captured and disposed of in appropriate locations at least 100 linear feet beyond waters of the State. No excess concrete or concrete washings shall be allowed to contact waters of the State. In addition, all concrete contact water disposal locations as well as concrete washout basins shall have adequate BMPs in accordance with the Caltrans Construction Site Best Management Practices Manual (CCSBMPM).
19. All materials used for cleaning concrete from tools and equipment, and any wastes generated by this activity, shall be adequately contained to prevent contact with soil and surface water and shall be disposed of properly within a clearly designated area at least 100 linear feet beyond waters of the State
20. When operations are complete, any excess material or debris shall be removed from the work area and disposed of properly and in accordance with the Special Provisions for the project and/or Standard Specification 7-1.13, Disposal of Material Outside the Highway Right of Way. Caltrans shall submit to the Regional Water Board the satisfactory evidence provided to the Caltrans engineer by the Contractor referenced in Standard Specification 7-1.13.
21. Work in flowing or standing surface waters, unless otherwise proposed in the project description and approved by the Regional Water Board, is prohibited. If construction dewatering of groundwater is found to be necessary, Caltrans shall use a method of water disposal other than disposal to surface waters (such as land disposal) or the Caltrans shall apply for coverage under the Low Threat Discharge Permit or an individual National Pollutant Discharge Elimination System (NPDES) Permit and receive notification of coverage to discharge to surface waters, prior to the discharge.
22. If a water diversion is utilized as described in the application Caltrans shall notify the Regional Water Board at least five days prior to utilizing the diversion. If the diversion is utilized during construction the following water quality monitoring shall be conducted as follows. Caltrans shall establish effluent, upstream (background) and downstream monitoring locations to demonstrate compliance with all applicable water quality objectives. The downstream location shall be no more than 50 feet from the effluent location. Field measurements shall be taken from each location four times daily for flow, pH, temperature, dissolved oxygen, total

dissolved solids, turbidity and specific conductance. In addition, visual observations shall be made four times daily and include the appearance of the discharge including color, turbidity, floating or suspended matter or debris, appearance of the receiving water at the point of discharge (occurrence of erosion and scouring, turbidity, solids deposition, unusual aquatic growth, etc), and observations about the receiving water, such as the presence of aquatic life. Measurements shall be collected from each sampling location four times daily while the diversion is being utilized.

23. Whenever, as a result of project activities, downstream measurements exceed the following water quality objectives:

pH	<6.5 or >8.5 (any changes >0.5 units)
temperature	1°F above natural background
dissolved oxygen	<7 milligrams per liter (mg/L)
total dissolved solids	>100 mg/L
turbidity	20% above natural background
specific conductance	>175 micromhos @ 77°F

Appropriate measurements shall be collected from all monitoring locations every hour during the period of increase, and shall continue until measurements demonstrate compliance with receiving water limitations and the water quality parameters are no longer increasing as a result of project activities. If any measurements are beyond the water quality objectives 50 feet downstream of the source(s), all necessary steps shall be taken to install, repair, and/or modify BMPs to control the source(s). In addition, the overall distance from the source(s) to the downstream extent of the exceedance shall be measured.

24. Monitoring results shall be reported to appropriate Regional Water Board staff person by telephone within one hour of taking any measurements that exceed the limits in condition 23 (turbidity only if it is higher than 20 NTU as well). Pictures of the tributary upstream, downstream and within the working and/or disturbed area shall be taken and submitted to the appropriate Regional Water Board staff via e-mail or fax within 24 hours of the incident. All other monitoring data shall be reported on a monthly basis and is due to the Regional Water Board by the 15th of the following month.
25. Calibration logs for all field monitoring equipment shall be maintained and be available to the Regional Water Board on request.
26. Fueling, lubrication, maintenance, storage and staging of vehicles and equipment shall be outside of waters of the United States and the State. 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 or the United States. At no time shall the Applicant use any vehicle or equipment which leaks any substance that may impact water quality.

27. In the event of any violation or threatened violation of the conditions of this Order, the violation or threatened violation shall be subject to any remedies, penalties, process or sanctions as provided for under applicable state or federal law. For the purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this Order. In response to a suspected violation of any condition of this certification, the State Water Board may require the holder of any federal permit or license subject to this Order to furnish, under penalty of perjury, any technical or monitoring reports the State Water Board deems appropriate, provided that the burden, including costs, of the reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In response to any violation of the conditions of this Order, the Regional Water Board may add to or modify the conditions of this Order as appropriate to ensure compliance.
28. The Regional Water Board may add to or modify the conditions of this Order, 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.
29. The Van Duzen River watershed is listed on the State of California Clean Water Act Section 303(d) list as impaired for sediment. Given that roads are a responsible source of sediment in the watershed (directly, from surface erosion, and, indirectly, by triggering landslides) a good first step can be made by focusing on reducing sediment from roads in the watershed. Reducing road-related sediment should be made a high priority. If a TMDL implementation plan is adopted prior to the expiration date of this Order, the Regional Water Board may revise the provisions of this Order to address actions identified in such action plan.
30. This Order is not transferable. In the event of any change in control of ownership of land presently owned or controlled by the Applicant, the Applicant shall notify the successor-in-interest of the existence of this Order by letter and shall forward a copy of the letter to the Regional Water Board. The successor-in-interest must send to the Regional Water Board Executive Officer a written request for transfer of this Order to discharge dredged or fill material under this Order. The request must contain the following:
 - a. requesting entity's full legal name

- b. the state of incorporation, if a corporation
 - c. address and phone number of contact person
 - d. description of any changes to the project or confirmation that the successor-in-interest intends to implement the project as described in this Order.
31. The authorization of this certification for any dredge and fill activities expires on March 3, 2015. Conditions and monitoring requirements outlined in this Order are not subject to the expiration date outlined above, and remain in full effect and are enforceable.
32. Please contact Jeremiah Puget of our staff at (707) 576-2835 or jpuget@waterboards.ca.gov if you have any questions.



Catherine Kuhlman
Executive Officer

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Web link: 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 can be found at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0017.pdf

Original sent to: Mr. Dana York, CDOT, P.O. Box 3700, Eureka, CA 95501-3700

Copies sent to: Ms. Jane Hicks, U.S. Army Corps of Engineers, Regulatory Functions, 1455 Market Street, San Francisco, CA 94103-1398

U.S. Army Corps of Engineers, District Engineer, 601 Startare Drive, Box 14, Eureka, CA 95501

Ms. Carol Wilson, CDOT, P.O. Box 3700, Eureka, CA 95501-3700



U S Army Corps of
Engineers
Sacramento District

Nationwide Permit Summary

33 CFR Part 330; Issuance of Nationwide Permits - March 19, 2007 includes corrections of May 8, 2007 and addition of regional conditions December 2007

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10 acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4)

A. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as appropriate, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact

the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP.

1. Navigation.

- (a) No activity may cause more than a minimal adverse effect on navigation.
- (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
- (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

3 Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or

restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

15. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

16. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

17. Endangered Species.

(a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No

activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have “no effect” on listed species or critical habitat, or until Section 7 consultation has been completed.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal “takes” of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at <http://www.fws.gov/> and <http://www.noaa.gov/fisheries.html> respectively.

18. Historic Properties.

(a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to

notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

19. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWP 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

20 Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require pre-construction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the

aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWP. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

21. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR

330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

22. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

23. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

24. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

25. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

26. Compliance Certification. Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:

(a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;

(b) A statement that any required mitigation was completed in accordance with the permit conditions; and

(c) The signature of the permittee certifying the completion of the work and mitigation.

27. Pre-Construction Notification.

(a) **Timing.** Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) Forty-five calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) **Contents of Pre-Construction Notification:** The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);

(4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic

property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination:

(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWP and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.

(5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

(e) In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant

submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

(a) **28. Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

B. Regional Conditions:

I. Sacramento District (All States, except Colorado)

1. When pre-construction notification (PCN) is required, the prospective permittee shall notify the Sacramento District in accordance with General Condition 27 using either the South Pacific Division Preconstruction Notification (PCN) Checklist or a completed application form (ENG Form 4345). In addition, the PCN shall include:

a. A written statement explaining how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States;

b. Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and size (in acreage) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the high tide line should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation; and

c. Pre-project color photographs of the project site taken from designated locations documented on the plan drawing.

2. The permittee shall complete compensatory mitigation required by special conditions of the NWP verification before or concurrent with construction of the authorized activity, except when specifically determined to be impracticable by the Sacramento District. When project mitigation involves use of a mitigation bank or in-lieu fee program, payment shall be made before commencing construction.

3. The permittee shall record the NWP verification with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records of title to or interest in real property against areas (1) designated to be preserved as part of mitigation for authorized impacts, including any associated covenants or restrictions, or (2) where structures such as boat ramps or docks, marinas, piers, and permanently moored vessels will be constructed in or adjacent to navigable waters (Section 10 and Section 404). The recordation shall also include a map showing the surveyed location of the authorized structure and any associated areas preserved to minimize or compensate for project impacts.

4. The permittee shall place wetlands, other aquatic areas, and any vegetative buffers preserved as part of mitigation for impacts into a separate "preserve" parcel prior to discharging

dredged or fill material into waters of the United States, except where specifically determined to be impracticable by the Sacramento District. Permanent legal protection shall be established for all preserve parcels, following Sacramento District approval of the legal instrument.

5. The permittee shall allow Corps representatives to inspect the authorized activity and any mitigation areas at any time deemed necessary to determine compliance with the terms and conditions of the NWP verification. The permittee will be notified in advance of an inspection.

6. For NWPs 29, 39, 40, 42, 43, 44, and 46, requests to waive the 300 linear foot limitation for intermittent or ephemeral waters of the U.S. shall include an evaluation of functions and services provided by the waterbody taking into account the watershed, measures to be implemented to avoid and minimize impacts, other measures to avoid and minimize that were found to be impracticable, and a mitigation plan for offsetting impacts.

7. Road crossings shall be designed to ensure fish passage, especially for anadromous fisheries. Permittees shall employ bridge designs that span the stream or river, utilize pier or pile supported structures, or involve large bottomless culverts with a natural streambed, where the substrate and streamflow conditions approximate existing channel conditions. Approach fills in waters of the United States below the ordinary high water mark are not authorized under the NWPs, except where avoidance has specifically been determined to be impracticable by the Sacramento District.

8. For NWP 12, clay blocks, bentonite, or other suitable material shall be used to seal the trench to prevent the utility line from draining waters of the United States, including wetlands.

9. For NWP 13, bank stabilization shall include the use of vegetation or other biotechnical design to the maximum extent practicable. Activities involving hard-armoring of the bank toe or slope requires submission of a PCN per General Condition 27.

10. For NWP 23, the PCN shall include a copy of the signed Categorical Exclusion document and final agency determinations regarding compliance with Section 7 of the Endangered Species Act, Essential Fish Habitat under the Magnussen-Stevens Act, and Section 106 of the National Historic Preservation Act.

11. For NWP 44, the discharge shall not cause the loss of more than 300 linear feet of streambed. For intermittent and ephemeral streams, the 300 linear foot limit may be waived in writing by the Sacramento District. This NWP does not authorize discharges in waters of the United States supporting anadromous fisheries.

12. For NWPs 29 and 39, channelization or relocation of intermittent or perennial drainage, is not authorized, except when, as determined by the Sacramento District, the relocation would result in a net increase in functions of the aquatic ecosystem within the watershed.

13. For NWP 33, temporary fills for construction access in waters of the United States supporting fisheries shall be accomplished with clean, washed spawning quality gravels where practicable as determined by the Sacramento District, in consultation with appropriate federal and state wildlife agencies.

14. For NWP 46, the discharge shall not cause the loss of greater than 0.5 acres of waters of the United States or the loss of more than 300 linear feet of ditch, unless this 300 foot linear foot limit is waived in writing by the Sacramento District.

15. For NWPs 29, 39, 40, 42, and 43, upland vegetated buffers shall be established and maintained in perpetuity, to the maximum extent practicable, next to all preserved open waters, streams and wetlands including created, restored, enhanced or preserved waters of the U.S., consistent with General Condition 20. Except in unusual circumstances, vegetated buffers shall be at least 50 feet in width.

16. All NWPs except 3, 6, 20, 27, 32, 38, and 47, are revoked for activities in histosols and fens and in wetlands contiguous with fens. Fens are defined as slope wetlands with a histic epipedon that are hydrologically supported by groundwater. Fens are normally saturated throughout the growing season, although they may not be during drought conditions. For NWPs 3, 6, 20, 27, 32, and 38, prospective permittees shall submit a PCN to the Sacramento District in accordance with General Condition 27.

17. For all NWPs, when activities are proposed within 100 feet of the point of groundwater discharge of a natural spring, prospective permittees shall submit a PCN to the Sacramento District in accordance with General Condition 27. A spring source is defined as any location where ground water emanates from a point in the ground. For purposes of this condition, springs do not include seeps or other discharges which lack a defined channel.

II. California Only

1. In the Lake Tahoe Basin, all NWPs are revoked. Activities in this area shall be authorized under Regional General Permit 16 or through an individual permit.

2. In the Primary and Secondary Zones of the Legal Delta, NWPs 29 and 39 are revoked. New development activities in the Legal Delta will be reviewed through the Corps' standard permit process.

III. Nevada Only

1. In the Lake Tahoe Basin, all NWPs are revoked. Activities in this area shall be authorized under Regional General Permit 16 or through an individual permit.

IV. Utah Only

1. For all NWPs, except NWP 47, prospective permittees shall submit a PCN in accordance with General Condition 27 for any activity, in waters of the United States, below 4217 feet mean sea level (msl) adjacent to the Great Salt Lake and below 4500 feet msl adjacent to Utah Lake.

2. A PCN is required for all bank stabilization activities in a perennial stream that would affect more than 100 linear feet of stream

3. For NWP 27, facilities for controlling stormwater runoff, construction of water parks such as kayak courses, and use of grout or concrete to construct in-stream structures are not authorized. A PCN is required for all projects exceeding 1500 linear feet as measured on the stream thalweg, using in stream structures exceeding 50 cubic yards per structure and/or incorporating grade control structures exceeding 1 foot vertical

drop. For any stream restoration project, the post project stream sinuosity shall be appropriate to the geomorphology of the surrounding area and shall be equal to, or greater than, pre project sinuosity. Sinuosity is defined as the ratio of stream length to project reach length. Structures shall allow the passage of aquatic organisms, recreational water craft or other navigational activities unless specifically waived in writing by the District Engineer.

V. Colorado Only

1. Final Regional Conditions Applicable to Specific Nationwide Permits within Colorado.

a. Nationwide Permit Nos. 12 and 14, Utility Line Activities and Linear Transportation Projects. In the Colorado River Basin, utility line and road activities crossing perennial water or special aquatic sites require notification to the District Engineer in accordance with General Condition 27 (Pre-Construction Notification).

b. Nationwide Permit No. 13 Bank Stabilization. In Colorado, bank stabilization activities necessary for erosion prevention in streams that average less than 20 feet in width (measured between the ordinary high water marks) are limited to the placement of no more than 1/4 cubic yard of suitable fill* material per running foot below the plane of the ordinary high water mark. Activities greater than 1/4 cubic yard may be authorized if the permittee notifies the District Engineer in accordance with General Condition 27 (Pre-Construction Notification) and the Corps determines the adverse environmental effects are minimal. [* See (g) for definition of Suitable Fill]

c. Nationwide Permit No. 27 Aquatic Habitat Restoration, Establishment, and Enhancement Activities.

(1) For activities that include a fishery enhancement component, the Corps will send the Pre-Construction Notification to the Colorado Division of Wildlife (CDOW) for review. In accordance with General Condition 27 (Pre-Construction Notification), CDOW will have 10 days from the receipt of Corps notification to indicate that they will be commenting on the proposed project. CDOW will then have an additional 15 days after the initial 10-day period to provide those comments. If CDOW raises concerns, the applicant may either modify their plan, in coordination with CDOW, or apply for a standard individual permit.

(2) For activities involving the length of a stream, the post-project stream sinuosity will not be significantly reduced, unless it is demonstrated that the reduction in sinuosity is consistent with the natural morphological evolution of the stream (sinuosity is the ratio of stream length to project reach length).

(3) Structures will allow the upstream and downstream passage of aquatic organisms, including fish native to the reach, as well as recreational water craft or other navigational activities, unless specifically waived in writing by the District Engineer. The use of grout and/or concrete in

building structures is not authorized by this nationwide permit.

(4) The construction of water parks (i.e., kayak courses) and flood control projects are not authorized by this nationwide permit.

d. Nationwide Permits Nos. 29 and 39; Residential Developments and Commercial and Institutional Developments. A copy of the existing FEMA/locally-approved floodplain map must be submitted with the Pre-Construction Notification. When reviewing proposed developments, the Corps will utilize the most accurate and reliable FEMA/locally-approved pre-project floodplain mapping, not post-project floodplain mapping based on a CLOMR or LOMR. However, the Corps will accept revisions to existing floodplain mapping if the revisions resolve inaccuracies in the original floodplain mapping and if the revisions accurately reflect pre-project conditions.

2. Final Regional Conditions Applicable to All Nationwide Permits within Colorado

e. Removal of Temporary Fills. General Condition 13 (Removal of Temporary Fills) is amended by adding the following: When temporary fills are placed in wetlands in Colorado, a horizontal marker (i.e. fabric, certified weed-free straw, etc.) must be used to delineate the existing ground elevation of wetlands that will be temporarily filled during construction.

f. Spawning Areas. General Condition 3 (Spawning Areas) is amended by adding the following: In Colorado, all Designated Critical Resource Waters (see enclosure 1) are considered important spawning areas. Therefore, In accordance with General Condition 19 (Designated Critical Resource Waters), the discharge of dredged or fill material is not authorized by the following nationwide permits in these waters: NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50. In addition, in accordance with General Condition 27 (Pre-Construction Notification), notification to the District Engineer is required for use of the following nationwide permits in these waters: NWP 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37 and 38”.

g. Suitable Fill. In Colorado, use of broken concrete as fill material requires notification to the District Engineer in accordance with General Condition 27 (Pre-Construction Notification). Permittees must demonstrate that soft engineering methods utilizing native or non-manmade materials are not practicable (with respect to cost, existing technology, and logistics), before broken concrete is allowed as suitable fill. Use of broken concrete with exposed rebar is prohibited in perennial waters and special aquatic sites.

h. Invasive Aquatic Species. General Condition 11 is amended by adding the following condition for work in perennial or intermittent waters of the United States: If heavy equipment is used for the subject project that was previously working in another stream, river, lake, pond, or wetland within 10 days of initiating work, one the

following procedures is necessary to prevent the spread of New Zealand Mud Snails and other aquatic hitchhikers:

(1) Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and keep the equipment dry for 10 days. OR

(2) Remove all mud and debris from Equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with either a 1:1 solution of Formula 409 Household Cleaner and water, or a solution of Sparquat 256 (5 ounces Sparquat per gallon of water). Treated equipment must be kept moist for at least 10 minutes. OR

(3) Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with water greater than 120 degrees F for at least 10 minutes.

3. Final Regional Conditions for Revocation/Special Notification Specific to Certain Geographic Areas

i. Fens: All Nationwide permits, except permit Nos. 3, 6, 20, 27, 32, 38 and 47, are revoked in fens and wetlands adjacent to fens. Use of nationwide permit Nos. 3, 20, 27 and 38, requires notification to the District Engineer, in accordance with General Condition 27 (Pre-Construction Notification), and the permittee may not begin the activity until the Corps determines the adverse environmental effects are minimal. The following defines a fen:

Fen soils (histosols) are normally saturated throughout the growing season, although they may not be during drought conditions. The primary source of hydrology for fens is groundwater. Histosols are defined in accordance with the U.S. Department of Agriculture, Natural Resources Conservation Service publications on Keys to Soil Taxonomy and Field Indicators of Hydric Soils in the United States (<http://soils.usda.gov/technical/classification/taxonomy>).

j. Springs: Within the state of Colorado, all NWP, except permit 47 (original ‘C’), require preconstruction notification pursuant to General Condition 27 for discharges of dredged or fill material within 100 feet of the point of groundwater discharge of natural springs. A spring source is defined as any location where groundwater emanates from a point in the ground. For purposes of this regional condition, springs do not include seeps or other discharges which do not have a defined channel.

4. Additional Information

The following provides additional information regarding minimization of impacts and compliance with existing general Conditions:

a. Permittees are reminded of the existing General Condition No. 6 which prohibits the use of unsuitable material. Organic debris, building waste, asphalt, car bodies, and trash are not suitable material. Also, General Condition 12 requires appropriate erosion and sediment controls (i.e. all fills must be permanently stabilized to

prevent erosion and siltation into waters and wetlands at the earliest practicable date). Streambed material or other small aggregate material placed along a bank as stabilization will not meet General Condition 12. Also, use of erosion control mats that contain plastic netting may not meet General Condition 12 if deemed harmful to wildlife.

b. Designated Critical Resource Waters in Colorado. In Colorado, a list of designated Critical Resource Waters has been published in accordance with General Condition 19 (Designated Critical Resource Waters). This list will be published on the Albuquerque District Regulatory home page (<http://www.spa.usace.army.mil/reg/>)

c. Federally-Listed Threatened and Endangered Species. General condition 17 requires that non-federal permittees notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project. Information on such species, to include occurrence by county in Colorado, may be found at the following U.S. Fish and Wildlife Service website: http://www.fws.gov/mountain%2Dprairie/endspp/name_county_search.htm

C. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.

D. Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration, establishment (creation), enhancement, or preservation of aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Discharge: The term “discharge” means any discharge of dredged or fill material.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic

resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands

contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWP, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of “open waters” include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects waterbodies with their adjacent uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 20.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete project: The term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete project must have independent utility (see definition). For linear projects, a “single and complete project” is all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream’s course, condition, capacity, or location that causes more than minimal

interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a jurisdictional water of the United States that, during a year with normal patterns of precipitation, has water flowing or standing above ground to the extent that an ordinary high water mark (OHWM) or other indicators of jurisdiction can be determined, as well as any wetland area (see 33 CFR 328.3(b)). If a jurisdictional wetland is adjacent--meaning bordering, contiguous, or neighboring--to a jurisdictional waterbody displaying an OHWM or other indicators of jurisdiction, that waterbody and its adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of "waterbodies" include streams, rivers, lakes, ponds, and wetlands.

CALIFORNIA DEPARTMENT OF FISH AND GAME
NORTHERN REGION
601 LOCUST STREET
REDDING, CALIFORNIA 96001



RECEIVED

JUN 07 2010

D. F. G. – EUREKA

LAKE OR STREAMBED ALTERATION AGREEMENT
NOTIFICATION No. 1600-2010-0004-R1
Unnamed Tributary to Little Larabee Creek

1 Encroachment

Mr. Frank Demling representing the California Department of Transportation
CAL TRANS RIDGETOP WALL

This Lake or Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and the California Department of Transportation (Permittee) as represented by Mr. Frank Demling.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified DFG on February 4, 2010, and submitted a revised notification with background information and addendum on May 28, 2010, that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1602, 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 on an Unnamed Tributary to Little Larabee Creek, tributary to the Van Duzen River, in the County of Humboldt, State of California; Section 9, Township 1N, Range 3E; Humboldt Base and Meridian, in the Larabee Valley 7.5-minute quadrangle, U.S. Geological Survey (USGS) map.

PROJECT DESCRIPTION

The project is limited to the excavation, installation of rock check dams, and revegetation of a drainage ditch.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: populations of Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), steelhead (*O. mykiss*), and other aquatic and riparian species.

The adverse effects the project could have on the fish or wildlife resources identified above include: increased sedimentation from construction, which may result in direct and/or incidental take and/or damage to spawning and rearing habitat downstream.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to DFG personnel, or personnel from another state, federal, or local agency upon request.
- 1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.
- 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 enter the project site at any time to verify compliance with the Agreement.
- 1.5 Except where otherwise stipulated in this Agreement, all work shall be in accordance with the forms, work plans, maps and drawings submitted with Notification No. 1600-2010-0004-R1 as modified as of March 2, 2010.

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.

- 2.1 All work within the bed, bank and channel shall be confined to the period June 1 through October 15 of each year and when the affected channel reach is void of surface water. Work may be conducted in or near the stream during the late season work period October 15 through November 1, provided adherence to all conditions in this Agreement and a) – e) below.
- a) The affected channel reach is void of surface water.
 - b) The Permittee shall complete any unfinished encroachment work, including erosion control measures, within 24 hours of DFG directing the Permittee to do so.
 - c) Prior to any work at a site, the Permittee shall stock-pile erosion control materials at the site. All bare mineral soil exposed in conjunction with crossing construction, deconstruction, maintenance or repair or removal shall be treated for erosion immediately upon completion of work on the crossing, and prior to the onset of precipitation capable of generating runoff.
 - d) Road construction leading directly into or out of a proposed stream crossing shall only be performed when soils are sufficiently dry so that sediment is not discharged into streams.
 - e) When a 7-day National Weather Service forecast of rain includes a minimum of 5 consecutive days with any chance of precipitation, 3 consecutive days with a 30% or greater chance of precipitation, or 2 consecutive days of 50% or greater chance of precipitation, the Permittee shall finish work underway at encroachment and refrain from starting any new work at encroachment prior to the rain event.
- 2.2 No fill material shall be placed within a stream except as specified in this Agreement.
- 2.3 All heavy equipment (including parts i.e.; buckets) that will be entering the flow of a watercourse shall be free of materials deleterious to aquatic life including oil, grease, hydraulic fluid, soil and other debris. Cleaning of equipment shall take place outside of the channel and prior to entering the water.
- 2.4 Any equipment or vehicles driven and/or operated within or adjacent to the stream channel shall be checked and maintained in a manner which prevents materials that, if introduced to water, could be deleterious to aquatic life, wildlife, or riparian habitat.
- 2.5 Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. The disturbed portions of any stream channel or lake margin within the high water mark of the stream or lake shall be restored to as near their

original condition as possible. Restoration shall include re-vegetation of areas stripped or exposed by project activities. Slash pack, rock, or other erosion protection suitable to DFG shall be placed in areas where vegetation cannot reasonably be expected to become reestablished.

- 2.6 Adequate and effective erosion and siltation control measures shall be used to prevent sediment or turbid or silt-laden water from entering streams. Where needed, the Permittee shall use native vegetation or other treatments including native slash, jute netting, straw wattles, and geotextiles to protect and stabilize soils.
- 2.7 All bare mineral soil exposed in conjunction with crossing construction, deconstruction, maintenance or repair, shall be treated for erosion prior to the onset of precipitation capable of generating run-off or the end of the yearly work period, whichever comes first. Restoration shall include using native slash or seeding and mulching of all bare mineral soil exposed in conjunction with encroachment work. Erosion control shall consist of at least 2 to 4 inches of certified weed-free straw mulch and 100 lbs/acre equivalent barley seed. No annual (Italian) ryegrass (*Lolium multiflorum*) shall be used.
- 2.8 Encroachments and associated structures, fills, and other exposed soils shall be armored as needed to protect fill, abutments, and the stream channel and banks from erosion.
- 2.9 All large woody debris (LWD), excavated during crossing construction or deconstruction shall be used on site or at other locations throughout the property for streambed and bank stabilization or erosion control. LWD shall be sufficiently anchored or keyed-in to resist movement during high flows and placed in a manner that prevents under-cutting of stream banks.
- 2.10 The Permittee shall provide site maintenance including, but not limited to, re-applying erosion control to minimize surface erosion and ensuring drainage structures, streambeds and banks remain sufficiently armored and/or stable.
- 2.11 Structures and associated materials not designed to withstand high seasonal flows shall be removed to areas above the ordinary high water mark before such flows occur or the end of the yearly work period, whichever comes first.
- 2.12 Refueling of equipment and vehicles and storing, adding or draining lubricants, coolants or hydraulic fluids shall not take place within or adjacent to any stream. All such fluids and containers shall be disposed of properly. Heavy equipment parked within or adjacent to the stream shall use drip pans or other devices (i.e., absorbent blankets, sheet barriers or other materials) as needed to prevent soil and water contamination.

- 2.13 All activities performed in the field which involve the use of petroleum or oil based substances shall employ absorbent material designated for spill containment and clean up activity on site for use in case of accidental spill. Clean-up of all spills shall begin immediately. The Permittee shall immediately notify the State Office of Emergency Services at 1-800-852-7550. DFG shall be notified by the Permittee and consulted regarding clean-up procedures.
- 2.14 No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete washings, oil or petroleum products, or other organic or earthen material from construction work, or associated activity of whatever nature shall be allowed to enter into, or be placed where it may be washed by rainfall or runoff into Waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. (Not applicable to material installed permanently or temporarily as part of the project activities).
- 2.15 Upon DFG determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation, shall be halted until effective Department approved control devices are installed, or abatement procedures are initiated.
- 2.16 The disturbed portions of any stream channel and adjacent areas shall be restored to as near their original condition as possible. Crossings shall emulate the natural streambed elevation, substrate and flow velocity to the extent feasible.

SITE-SPECIFIC CONDITONS:

- 2.17 The 60-inch Corrugated Steel Pipe (CSP) located at Post Mile (PM) 29.2 on State Route 36 shall be regularly inspected to ensure the culvert inlet is free of debris and the head-gate is fully open.

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:

Mr. Frank Demling representing the California Department of Transportation
1656 Union Street
Eureka, California 95501
Office Phone: 707-441-6554
Fax: 707-441-5775

To DFG:

Department of Fish and Game
Region 1
619 Second Street
Eureka, California 95501
Attn: Lake and Streambed Alteration Program – Laurie Harnsberger
Notification #1600-2010-0318-R1
Fax: (707) 441-2021
Email: lharnsberger@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 May 28, 2015, 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.

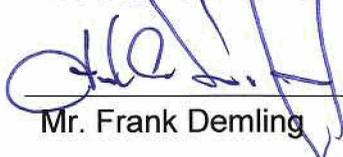
AUTHORIZATION

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 THE CALIFORNIA DEPARTMENT OF
TRANSPORTATION**



Mr. Frank Demling

JUNE 3, 2010

Date

FOR DEPARTMENT OF FISH AND GAME



Acting Environmental Program Manager

6/9/10

Date

Prepared by: Gordon Leppig
Staff Environmental Scientist
May 28, 2010



TECHNICAL MEMORANDUM

Geotechnical Engineering
Materials Testing & Inspection
Environmental Science & Engineering
Water Resources
Earthquake Engineering
Air Quality

Date: August 13, 2008
To: Charlie Narwold, Sr. Engineering Geologist
Division of Engineering Services
Office of Geotechnical Design North
Branch B

From: Terry Craven, G.E.
William V. McCormick, C.E.G.

Kleinfelder Project: 92859/REP-2

Subject: Foundation Report
Storm Damage Repair (Ridgetop Wall)
HUM 36 PM 29.17
EA: 01-475601
Humboldt County, CA

1 PROJECT DESCRIPTION

During the winter of 2005/2006 a landslide occurred on the south (downhill) side of Highway 36, near milepost 29.17, west of Dinsmore, in Humboldt County, California. The location of the site is shown on Plate 1, Site Location. As shown on the Site Plan, Plate 2, the landslide consists of a slump flow complex with multiple centers of movement. The portion of the landslide that presents the greatest threat to the roadway is approximately 130 feet wide and extends from the edge of pavement to a small creek that is approximately 250 feet downslope (see Plate 3, Section A-A'). No existing retaining structures are located within the limits of this project.

The purpose of this project is to provide geotechnical design parameters for a retaining structure to protect the road from the most threatening portion of the landslide complex. Stabilization of the entire landslide complex is not part of this project. Portions of the landslide that are located below the retaining structure may continue to move downslope after the wall is constructed. Portions of the landslide complex that are present to the east of the wall may continue to move and could potentially damage the roadway in the future.

2 GEOTECHNICAL SCOPE OF WORK

The scope of our work for this project included the following:

- Review of available geologic information addressing this area.
- Geologic mapping of the landslide and immediate vicinity.
- Drilling, logging, and sampling of five exploratory borings.
- Installation of two inclinometers at two boring locations.
- Laboratory testing of selected samples from the borings.
- Global stability analyses.
- Preparation of Log of Test Borings (LOTB).
- Preparation of this report.

3 PERTINENT REPORTS AND INVESTIGATIONS

In preparation of this memorandum, the following documents/reports were reviewed:

United States Department of Transportation, Federal Highway Administration-California Division, Damage Assessment Form (DAF) – Title 23, Humboldt County, Highway 36, Post Mile 29.17, dated 1-11-06.

2000, McLaughlin, R. J. et al., United States Geological Survey Miscellaneous Field Studies MF-2336, Version 1.0, Geology of the Cape Mendocino, Eureka, Garberville, and Southwestern part of the Hayfork 30X60 Minute Quadrangles and Adjacent Offshore Area, Northern California)

Caltrans Seismic Hazard Map and Report, Mualchin, 1996 with errata dated March 2006.

4 PROPOSED STRUCTURE DESCRIPTION

It is proposed to construct a retaining structure on the south side of the existing roadway to protect the road surface and supporting prism from landslide-related damage. As proposed, the retaining structure will be a soldier pile and lagging wall, which may be partially restrained by one or more rows of tiebacks. At the direction of Caltrans, the wall will be located approximately four feet outside of the fog line. Our recommendations for the lateral limits of the wall are illustrated on Plate 2.



5 SITE DESCRIPTION AND TOPOGRAPHY

At Post Mile 29.17, the two lane Highway 36 roadway rises gently to the east at approximately 75H:1V (Horizontal:Vertical). The highway is located atop a fill embankment along the western portion of the site. Slope gradients along the embankment fill range from approximately 1.75H:1V to 2H:1V. The embankment fill tapers off and terminates at the eastern portion of the site where cut and fill slopes are encountered. Slope gradients south (downslope) of the roadway range from approximately 1H:1V on the existing failed embankment fill prism to 2H:1V on undisturbed embankment fill, and from 2.6H:1V to 4H:1V within the landslide mass. The cut slope at the northeastern portion of the site is at a gradient of approximately 1H:1V.

Landslide movement currently impacting the roadway is a slump flow complex with an estimated mass thickness of approximately 15 to 30 feet. The arcuate headscarp of the landslide extends to the south edge of the roadway along an approximately 70-foot-wide section. The toe of the landslide terminates in the small creek located to the south of the roadway. The landslide complex is approximately 330 feet wide at its widest section, located 180 feet south of the roadway. Soil creep and erosional rilling were noted to the southwest of the site along the small creek.

A spring located just north of the roadway on the eastern portion of the site flows into a drainage swale which drains to the west adjacent to the north edge of the embankment fill. The drainage swale leads to a gate valve and culvert to the northwest of the site. Outfall from the culvert leads to a southeast flowing creek located southwest of the site. Drainage from the roadway currently flows over the embankment fill both to the north and south of the roadway. A small asphalt berm diverts drainage away from the landslide headscarp. The slopes south of the roadway within the landslide mass are vegetated with native grass and low shrubs. A dense stand of fir trees are located to the north of the roadway.

6 SUBSURFACE EXPLORATION AND LABORATORY TESTING

SUBSURFACE INVESTIGATION

Five (5) exploration borings, designated R-08-001 through R-08-005, were drilled at this site by Caltrans Office of Drilling Services using rotary wash drilling methods. Drilling was performed on April 14, 2008, through April 24, 2008. All drilling and sampling operations were supervised by Kleinfelder staff. Test borings R-08-001 and R-08-002 were drilled using a truck-mounted Acker MPC3 drill rig and test borings R-08-003, R-08-004, and R-08-005 were drilled using a track-mounted CS2000 drill rig. Both rigs used 102-mm diameter and 96-mm (HQ) casing equipped with a tungsten carbide Geo Barrel and #8 diamond impregnated core bit,



respectively. Borings R-08-001 and R-08-002 were advanced from the Highway 36 shoulder on the north and south edge of pavement, respectively, to depths of 70 feet to 76.5 feet. Borings R-08-003, R-08-004 and R-08-005 were drilled on a graded access road over the main landslide mass, approximately 55 and 59 feet south (downslope) of the south edge of pavement; depths ranged from 46.5 feet to 75 feet. The approximate locations of the borings are shown on Plate 2. Borings R-08-003, R-08-004 and R-08-005 were drilled at this location with the expectation that the retaining wall would be located in this area. Subsequent analyses indicated that a preferable wall location was closer to the existing roadway edge.

Samples of the soil and bedrock were obtained by coring, using equipment as described above, and using 2-inch (inside diameter) Modified California and 1.4-inch (inside diameter) Standard Penetration Test samplers each driven with an automatic 140-pound hammer dropped 30 inches. The blows required to drive the Modified California and Standard Penetration Test samplers were recorded for each 6 inches of penetration or fraction thereof. Visual classifications were made in accordance with the attached Soil and Rock Legend. The results of the exploration are summarized on the attached Log of Test Borings in Appendix A.

As part of this work, inclinometer casing was installed to approximately 75 feet below the ground surface within the bore holes for Borings R-08-002, and R-08-004. The casing was perforated for its full length except for the upper 10 feet to permit possible monitoring of future water levels within the casing. The annular space around the perforated portion of the casing was backfilled with sand and the upper 10 feet was backfilled with bentonite. No inclinometer readings or water level measurements were obtained at the time of installation. Inclinometer readings were obtained by Caltrans on May 8 and June 5, 2008. Inclinometer monitoring results are presented in Appendix C.

LABORATORY TESTING

Laboratory testing of selected soil samples obtained from the test borings was performed at Kleinfelder's Geotechnical Laboratory in Santa Rosa, California. The purpose of the testing was to verify the field visual classifications and obtain information for subsequent engineering evaluations. Tests performed included:

- Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass (ASTM D2216).

- Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937).

- Particle-Size Analysis of Soils (ASTM D422).

- Liquid Limit, Plastic Limit, and Plasticity Index of Soils (ASTM D4318).

- Unconfined Compressive Strength of Cohesive Soils (ASTM D2166).

- Unconsolidated, undrained, triaxial strength test (ASTM D2850).



Corrosivity tests were performed by an independent testing laboratory (AP Engineering & Testing, Inc. in Pomona, California) in accordance with Caltrans Test Methods 532 – pH, 643 – resistivity, 417 – sulfate content, and 422 – chloride content.

The results of the laboratory tests, together with a summary sheet, are provided in Appendix B.

7 SITE GEOLOGY AND SUBSURFACE CONDITIONS

REGIONAL GEOLOGY

Regional Geology is illustrated on Plate 5, "Regional Geology." The site is located in the northern Coast Ranges Geomorphic Province, a dynamic region of California characterized by complex folding and faulting. The province is generally characterized by northwest-trending mountain ranges and intervening valleys that are a reflection of the dominant northwest structural trend of the bedrock in the region. The basement rock in the region is presumed to consist of the Franciscan Complex, a diverse group of igneous, sedimentary, and metamorphic rocks. The Franciscan Complex is part of a northwest trending belt of material immediately adjacent to the eastern edge of the San Andreas Fault system, which is located approximately 33 miles south of the site (Plate 5). The site is located approximately 28 miles northeast of the Cape Mendocino Triple Junction where the Gorda, North American, and the Pacific plates meet.

SITE GEOLOGY

Site geology is illustrated on Plate 2, Site Plan. The geology of the site and vicinity has been mapped by McLaughlin et al. (2000, United States Geological Survey Miscellaneous Field Studies MF-2336, Geology of the Cape Mendocino, Eureka, Garberville, and Southwestern part of the Hayfork 30 X 60 Minute Quadrangles and Adjacent Offshore Area, Northern California). McLaughlin et al. (2000) indicate the project site, as well as the east and north site vicinity, is underlain by a mélangé unit of the Jurassic-Cretaceous age Central Belt Franciscan Complex. This bedrock is comprised of pervasively sheared argillite and meta-sandstone. Immediately northeast of the site, the Broken Formation unit of the Central Belt Franciscan Complex is mapped. This unit is comprised of meta-sandstone and meta-argillite with only minor amounts of highly sheared rocks. To the south of the site chert, serpentinite, and serpentinite mélangé are mapped. These units are of limited lateral extent typically less than 1000 feet wide.

McLaughlin et al. (2000) did not identify any landslide features at the site or within the site vicinity.

SUBSURFACE CONDITIONS

The following table summarizes the drilling program performed for this investigation.

Table 1: Hwy 36 PM 29.17 Boring Summary

I.D.	Approx. Station	Location ⁽¹⁾	Depth of Boring (ft)	Surface Elevation (ft)	Date Completed	Depth to In-Place ⁽³⁾ Bedrock (ft)
R-08-001	11+94	15 feet left	70.0	2272+/-	4-17-08	19.8
R-08-002	12+87	9 feet right	76.5	2273+/-	4-15-08	17.5
R-08-003	11+93	70 feet right	49.0	2242 ⁽²⁾ +/-	4-24-08	17.0
R-08-004	12+40	67 feet right	75.0	2247 ⁽²⁾ +/-	4-23-08	19.5
R-08-005	12+95	67 feet right	46.5	2249 ⁽²⁾ +/-	4-24-08	14.5

(1) Approximate distance from highway centerline, facing in direction of increasing stationing.

(2) Elevation based on hand level survey in field. Contours on Site Plan represent conditions as they existed before the access road construction and may differ from these elevations.

(3) This column designates the depth to the top of in-place bedrock, below the identified landslide material and below zones of decomposed or possibly disturbed bedrock.

Borings R-08-001 and R-08-002 were drilled on the north and south edges of the roadway, respectively. Both borings were drilled to the north of the active landslide mass. These borings encountered sandy clay to clayey sand fill to depths of 12 feet and 7 feet, respectively. The fill was underlain by colluvium consisting of sandy clay, and clay with gravel to depths between 11.8 and 19.8 feet. Creep disturbed, decomposed bedrock was encountered in boring R-08-002 extending from 11.8 to 17.5 feet below the road surface. In-place bedrock was encountered of depths of 19.8 and 17.5 feet in borings R-08-001 and R-08-002 respectively. Bedrock primarily consisted of pervasively sheared argillite with minor meta-sandstone and chert. Weathering varied from slightly to moderately weathered and strength ranged from very soft to hard.

Borings R-08-003, R-08-004, and R-08-005 were drilled on an access road constructed over the main landslide mass, between 67 and 70 feet south (downslope) of the centerline of Highway 36. Landslide deposits were found in these borings to depths of between 14.5 and 17 feet (possibly disturbed bedrock in borings R-08-004 and R-08-005 extended to depths of 19.5 feet and 16.5 feet respectively). The upper 5.5 to 11.5 feet of the landslide deposits consisted of clayey to silty gravel and sand which was identified as fill. Sandy to gravelly clay and clayey sand landslide deposits were found beneath the fill to the surface of the bedrock.

The textures of the landslide debris and decomposed bedrock are very similar and transitions should be considered approximate. As in borings R-08-001 and R-08-002, bedrock primarily consisted of pervasively sheared argillite with minor meta-sandstone and pyroxenite. Weathering varied from slightly to moderately weathered and strength ranged from very soft to hard.

Triaxial (unconsolidated, undrained "TXUU") tests were performed on seven samples of the argillite bedrock. The range of shear strength was between 1402 and 3494 pounds per square foot (psf) and averaged 2224 psf. An Unconfined Compression test was performed on a sample of hard meta-sandstone and a strength of 432,000 psf (3000 psi) was measured.

Cross Section A-A' (Plate 3) shows a typical subsurface section through the landslide. Cross Section B-B' (Plate 4) shows an approximate worst case (deepest landslide area) near the west end of the landslide. Plate 7 (Approximate Geologic Profile Along Proposed Retaining Wall) presents the anticipated geologic conditions at the proposed retaining wall location. Because borings were drilled a considerable distance from this profile, the depth to in-place bedrock is based on interpolation and extrapolation and should be considered approximate.

8 GROUNDWATER

Due to the use of drilling fluid, it was not possible to record groundwater depths at the time of drilling. Moisture/density test results indicate that most samples below a depth of approximately 10 feet were saturated or nearly saturated. Piezometers (perforated SI casing) were installed in Borings R-08-002 and R-08-004 to allow future groundwater monitoring. Results of groundwater monitoring to date are tabulated below. For design purposes we recommend that groundwater be assumed to rise to within 5 feet of the top of the wall unless it is artificially lowered by wall drainage measures.

WATER LEVEL MONITORING		
	Depth from top of casing to water level (feet)	
Date	R-08-004	R-08-002
5/8/2008	12	15
6/5/2008	15.3	15
7/9/2008	16.6	15.8

9 CORROSION POTENTIAL

Chemical analyses were performed on three (3) samples collected from the borings to evaluate corrosion potential of the on-site soils. Testing was performed by AP Engineering & Testing, Inc. in Pomona, California. The results of the corrosion tests are attached in Appendix B.

Based on the Caltrans Corrosion Guidelines (2003 version 1.0), a site is considered corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at the site: Chloride concentration is 500 ppm (0.05%) or greater, sulfate concentration is 2000 ppm (0.2%) or greater, or the pH is 5.5 or less. Based on these Guidelines and the laboratory test results, the site may be considered non-corrosive to steel and concrete.

10 EARTHQUAKE FAULTS AND SEISMICITY

According to the Caltrans Seismic Hazard Map and Report (CSHM, Mualchin, 1996 with errata dated March 2006), the nearest fault is the Little Salmon-Yager fault, which is located approximately 2 miles southwest of the site. The Little Salmon-Yager is a reverse fault capable of generating earthquakes with a maximum credible earthquake (MCE) magnitude of 7.00. The Caltrans Seismic Hazard Map and Report (1996) locates the site between the 0.5g and 0.6g Peak Bedrock Acceleration (PBA) contours associated with the Little Salmon-Yager fault. We recommend a PBA value of 0.6g and corresponding Peak Ground Acceleration (PGA) of 0.6g for the analysis and design of the proposed Highway 36 retaining wall. The PGA is estimated based on site soil Class C. A portion of the Caltrans Seismic Hazard map is shown on Plate 6.

The site does not lie within an Alquist-Priolo Special Studies Zone (CDMG, 1997). No active faults are mapped crossing the project site nor do any project towards the site.

11 GEOTECHNICAL AND FOUNDATION RECOMMENDATIONS

WALL LOCATION & DEPTH

Based on the field and laboratory data, it is our opinion that, without remediation, the material designated as active landslide deposits will continue to move downslope, and this will remove lateral support for the roadway. We recommend that a wall be designed to retain the roadway together with underlying soils. The proposed wall location is shown on Plate 2. At the direction of Caltrans, the wall is located approximately four feet outside of the highway fog line. Both ends of the proposed wall terminate approximately 10 feet outside the limits of the portion of the active landslide that currently threatens the roadway, for a total wall length of approximately 160 feet.

At the proposed wall location, the landslide appears to be up to 20 to 30 feet in depth, with the bottom of the landslide occurring at the top of, or slightly within, the bedrock formation. Over time it is probable that the existing landslide deposits will continue to translate downslope and we recommend that the wall be designed to retain all soil and rock that is located above the in-place bedrock surface. At the west end of the landslide, the wall may approach 30 feet in depth in order to penetrate through the existing fill embankment and into in-place bedrock. Plate 7 illustrates the approximate elevation of in-place bedrock along the length of the wall.

We point out that the portion of the landslide that is currently threatening the road is part of a larger landslide complex that extends more than 100 feet east of the east end of the proposed retaining wall. The subsurface exploration did not explore the limits of the eastern portion of the landslide complex since it does not appear to present an immediate threat to the road. However, it is probable that the eastern portion of the landslide complex will continue to move and, over time, it could damage the roadway.

SOIL & ROCK PARAMETERS

Based on the results of our subsurface investigation and laboratory testing, subsurface materials within the retained height of the proposed retaining wall (up to approximately 30 feet) consist of fill and landslide deposits overlying intensely fractured and moderately weathered bedrock, mainly comprised argillite and meta-sandstone. A cross section along the length of the proposed wall depicting our interpretation of the subsurface geologic conditions is presented on Plate 7. Based on our review of available data, we recommend that the following parameters be used for retaining wall design. These values represent our best estimate of actual soil properties and **do not contain a factor of safety**. Appropriate factors of safety must be applied during wall design. A surcharge pressure of 270 psf should be applied to the roadway surface behind the wall in accordance with Caltrans Bridge Design Specifications.

Table 2: Soil/Rock Parameters for Retaining Wall Design

Type	Approximate Depth to Bottom of Layer, at Retaining Wall Location (ft)	Total Unit Weight (pcf)	Angle of Internal Friction, ϕ (degrees)	Cohesion, c (psf)	K_a	K_p
Fill (Qaf)	7 to 24	130	30^2	0^2	0.33^4	0^5
Active Landslide Deposits (1113) & Colluvium	18 to 30	135	23^2	0^2	0.44^4	0^5
Fractured Bedrock (KJfcb1)	NA	144	35^3	0^3	0.27^4	3.7^4

¹ See Plate 7 for anticipated thickness along wall.

² Based on correlations with field penetration test data and soil type. Strength of landslide deposits was back-checked by assuming existing landslide has a factor of safety of ~1.0.

³ Strength was estimated based on TXUU tests as well as correlations with field blowcounts and material type.

⁴ Coulomb method of analysis with $\delta = 0$. The effective width to which the pressure is applied should be in accordance with Caltrans Bridge Design Specifications, Chapter 5.

⁵ Slope stability analyses indicate that materials overlying bedrock (downslope from the wall) possess a factor of safety against sliding that is less than 1.3; hence, we recommend that no passive resistance be assumed from these materials.

We understand that seismic wall loads will not be used in design since this is not a "critical" structure.

TIEBACK ANCHORS

Due to differences in strain compatibility between soil and bedrock, we recommend that tiebacks derive their support solely from the in-place bedrock formation. The tieback unbonded length will depend on the tieback inclination, elevation, and the overall wall height.

In general, the no-load zone should be determined by the longest of the following values:

- 1) The distance from the back of the wall to a point that is 5 feet beyond the critical failure surface (in this case the critical failure surface is the surface of the bedrock formation).
- 2) The distance from the back of the wall to a point that is a distance of H/5 (H = wall height) beyond the critical failure surface.
- 3) 15 feet beyond the back of the wall.

The location of the unbonded zone for Section A-A' is shown on Plate 8. Section A-A' is a typical cross section for the retaining wall. The location of the unbonded zone for Section B-B' is shown on Plate 9. Section B-B' is an approximately worst case condition. For tiebacks that are located 8 feet from the top of the wall and are inclined at 20° , the unbonded zone may be taken as 45 feet for Stations 11+75 through 12+25 (Based on Cross Section B-B') and as 35 feet for Stations 12+25 through 13+35 (based on Cross section A-A'). For tiebacks that are located at other depths or inclinations, the unbonded zone should be estimated from Plates 8 and 9, with a minimum length of 15 feet behind the wall.

SOLDIER PILES

Soldier piles should gain their vertical resistance from friction in the in-place bedrock. Because of the fractured nature of the rock and the difficulty in removing slough from drilled holes, end bearing resistance should be neglected. Bedrock quality varies widely. We recommend that soldier piles be designed for a skin friction in bedrock of 750 psf. This value is intended for use in a working stress analysis and contains a factor of safety of approximately 2.0.

Because of disturbance and deep weathering at the surface of the bedrock formation, we recommend that all soldier piling have a minimum embedment of 10 feet into in-place bedrock. Deeper penetrations may be required to satisfy wall vertical or lateral loading conditions. As discussed in Section 12 of this memorandum, an embedment of 10 feet is expected to be adequate to force a landslide failure below the existing failure plane and into in-place bedrock.

The depth to in-place bedrock varies. We estimate that the depth will vary from approximately 18 feet to 30 feet at the proposed wall location. A sketch of estimated in-place bedrock depth along the length of the wall is provided on Plate 7.

LAGGING

The purpose of the proposed wall is to protect the road from landslide related movements, not to stabilize the active landslide mass below the wall. As discussed in Section 12, and as shown on Plate 12, even if the upper 20 feet of soil is excavated below the wall, the slope factor of safety is increased to only 1.1. A minimum factor of safety of 1.3 is required by the Caltrans Design Specifications.

Based on the above considerations, it should be assumed that the landslide mass below the wall will continue to move and will eventually pull away from the downhill side of the wall. This could result in the loss of material between the piling. To protect against loss of material, lateral earth support should be provided extending down to the in-place bedrock surface (for the approximate depth of in-place bedrock refer to Plate 7). If support is provided by lagging, this would require temporary excavation to a depth of up to approximately 30 feet below existing grade (at the west end of the landslide), which may not be practical within the project

budget. If soldier pilings are spaced at three pile diameters or closer (center to center), soil arching should occur between the pilings to limit the internal loss of soil without the use of lagging (lagging should still be installed to at least five feet below the lowest tieback level). However, over time or in the presence of groundwater, loss of soil could still be significant between piling and future maintenance should be expected.

WALL BACKFILL

If required, backfill material behind the wall should be Class 1, Type B Permeable Material (Caltrans Standard Specifications 68-1.025). To prevent internal soil erosion, we recommend that a filter fabric (Caltrans Standard Specification 88-1.03) be placed between the Permeable fill and native soil. To prevent the accumulation of hydrostatic pressures behind the wall, we recommend that HDPE shims be installed between the lagging members.

To reduce backfill pressures, we recommend that any backfill placed within five feet of the wall (measured horizontally) be compacted with lightweight, hand-operated compaction equipment. Over-compaction of this fill can greatly increase wall pressures and/or deflections.

12 SLOPE STABILITY REVIEW

Kleinfelder performed slope stability analyses for the project using "Slide" version 5.03 by Rocscience. Plate 10 presents the results of an analysis of the existing (active) landslide. This analysis was performed to back calculate the residual soil strength within the landslide deposits. Plate 10 presents the results of an analysis along the identified failure surface. For this analysis we used the geometry of cross section A-A' (Plate 3). The internal angle of soil friction that produced a factor of safety equal to one was approximately 23° , which was used in our subsequent analyses.

We then added the proposed retaining wall to this section and ran the model again. A 270 psf surcharge pressure was applied to the roadway area above the wall. The wall was modeled as a series of rigid piling with sufficient shear strength to force the landslide below the tips of the piling. The result of this analysis is summarized on Plate 11. Based on this analysis, with the wall socketed a minimum of 10 feet into bedrock, the calculated factor of safety against global stability was in the range of 1.6 (a minimum of 1.3 is required).

We next checked wall design pressures by modeling an 18 foot-high wall (fully drained) with a triangular load applied to the face of the wall, see Plate 12. The force necessary to provide a factor of safety of 1.3 was calculated to be equivalent to that exerted by a fluid with a unit weight of 75 pcf, or a total load of 12,150 pounds per lineal foot of wall. This calculated force is approximately two percent less than the design load calculated using the coefficients in Table 2 (including the roadway surcharge and a factor of safety of 1.3); thus, we recommend designing the wall in accordance with the parameters in Table 2.



Finally, we checked the slope stability of material below the wall to see if removal of 20 feet of soil would improve stability of the remaining landslide deposits that are downslope of the wall. Twenty feet is the approximate maximum excavation acceptable to Caltrans. A result of this analysis is shown on Plate 13. Removal of this material increased the slope stability factor of safety to 1.1, which is still below the Caltrans standard of 1.3.

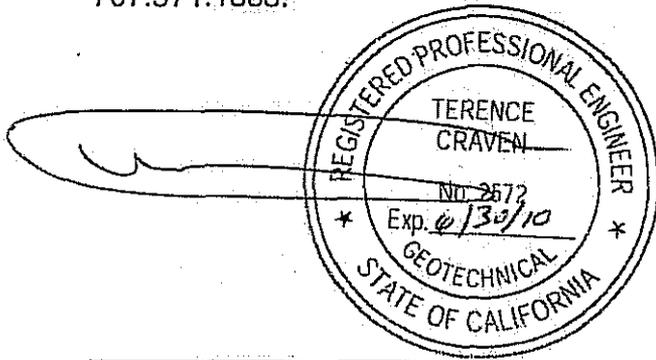
13 CONSTRUCTION CONSIDERATIONS

- Materials to be excavated will consist of fill, slide debris, and fractured/weathered rock. Groundwater may be encountered at shallow depth. Caving conditions will likely be encountered during drilling for the piles and tiebacks due to the granular nature of portions of the fill and landslide debris, and the intensely fractured and weathered nature of the rock. Temporary casing, drilling under slurry, or placement of slurry cement backfill or concrete and re-drilling may be required to control caving and should be performed in conformance with the provisions in Section 49-4.03 "Drilled Holes," of the Standard Specifications.
- Groundwater will likely be encountered in the pile and tieback holes. Pile and tieback installations may require dewatering or the placement of concrete and grout under water. If water is present and the holes are not dewatered, displacement of the water by means of a closed system using a concrete pump or tremie tube to place concrete and grout at the bottom of the holes will be required in conformance with the provisions in Section 51-1.10 "Concrete Deposited Under Water," of the Standard Specifications.
- Vertical cut sections should not be deeper than five feet without shoring or sloping in accordance with CAL/OSHA Standards.
- Sufficient and timely observation during construction should be performed to correlate findings of the investigation with actual subsurface conditions exposed during construction.
- The contractor should research utility locations and take necessary precautions to protect-in-place or relocate utilities as applicable, prior to excavation.
- Ponding of water adjacent to the structure should be avoided. During and after construction, positive drainage should be provided to direct surface water away from landslides and retaining structures. In particular, it is extremely important to collect the drainage from the south side of the road that currently flows over the face of the active landslide. Surface drainage should be collected into pipelines that are routed to suitable disposal areas away from the landslide.

- If additional subsurface drainage is desired, a deep subdrain can be constructed on the uphill side of the road between Stations 12+00 and 13+50. This subdrain may reduce the amount of subsurface pore water pressure acting on the road fill prism. If constructed, the drain should be a minimum of 10-feet-deep below the existing roadside drainage ditch and be constructed with a minimum 4-inch-diameter perforated pipe (SDR 35), encased in Class 2 permeable drain rock to within 2 feet of a native fill cap, compacted to a minimum of 90% relative compaction. The drain should be outletted to an appropriate drainage facility; possibly the drainage basin located north and west of this landslide site.

14 CLOSURE

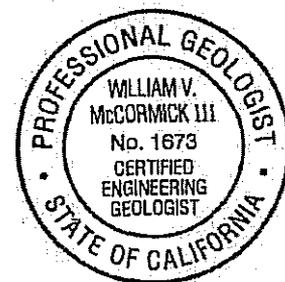
If you have any questions regarding the information provided herein, please contact us at 707.571.1883.



Terry Craven, GE 2572
Principal Geotechnical Engineer



William V. McCormick, CEG 1673
Principal Engineering Geologist



15 ATTACHMENTS

Plate 1 Site Location
Plate 2 Site Plan
Plate 3 Section A-A'
Plate 4 Section B-B'
Plate 5 Regional Geology
Plate 6 California Seismic Hazard Map
Plate 7 Approximate Geologic Profile Along Proposed Retaining Wall
Plate 8 Tieback Unbonded Zone, Section A-A'
Plate 9 Tieback Unbonded Zone, Section B-B'
Plate 10 Slope Stability: Back-Calculation Block Failure
Plate 11 Slope Stability: With Wall
Plate 12 Slope Stability: Lateral Pressure
Plate 13 Slope Stability: Downslope

Appendix A

Log of Test Borings (LOTBs, 7 pages)

Appendix B

Laboratory Test Summary
Laboratory Test Data Plates B-1 through B-7
Corrosion Test Results (AP Engineering and Testing, Inc.)

Appendix C

Slope Inclinometer Monitoring Results (2 pages)



PLATES



This drawing is the property of Kleinfelder. It is to be used only for the project and location specified herein. It is not to be used for any other project or location without the written consent of Kleinfelder. The user of this drawing is responsible for obtaining all necessary permits and approvals from the appropriate authorities. Kleinfelder is not responsible for any errors or omissions in this drawing. The user of this drawing is responsible for obtaining all necessary permits and approvals from the appropriate authorities. Kleinfelder is not responsible for any errors or omissions in this drawing.



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 APPROXIMATE SCALE (feet)
 Reference: TPOI National Geographic Holdings, 2001

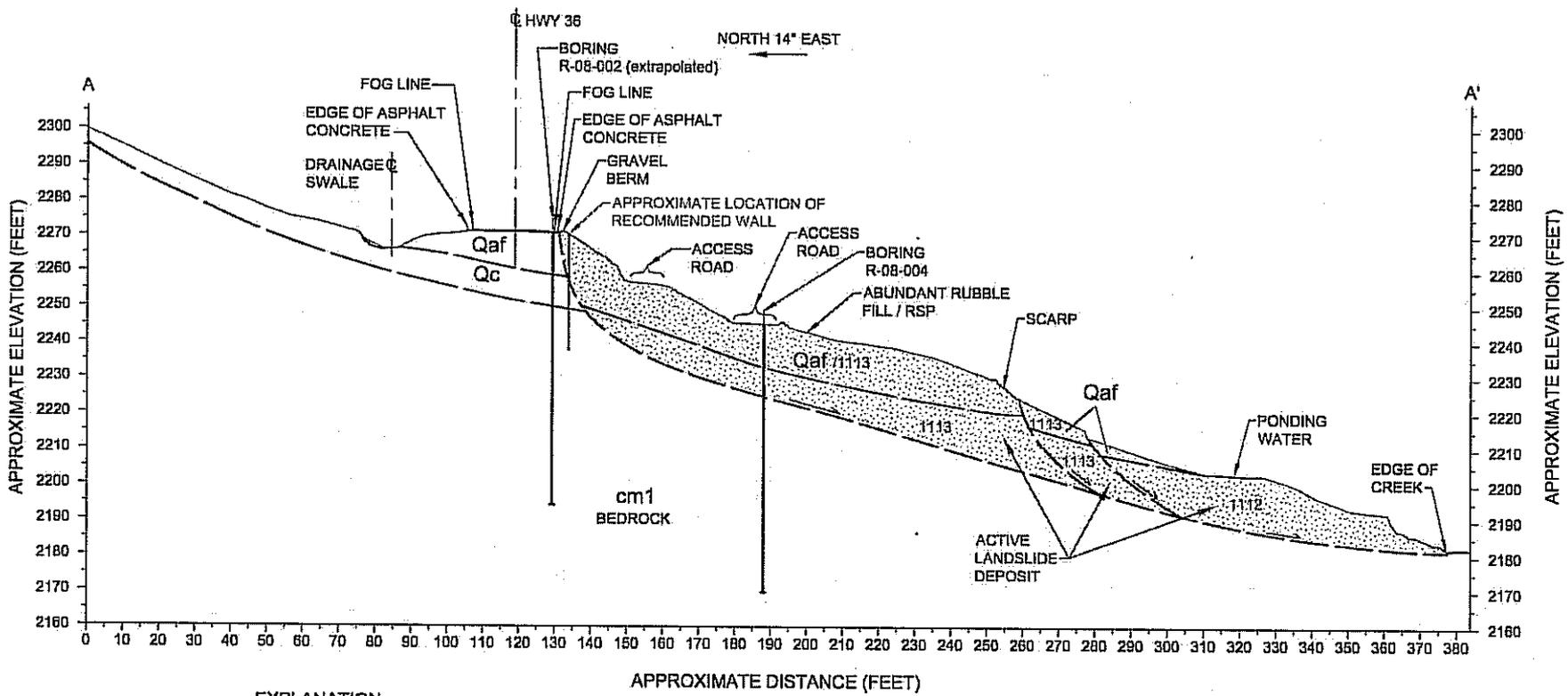
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DRAWN BY:	JULY 2008
CHECKED BY:	PH
FILE NAME:	JR
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SITE LOCATION

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 HIGHWAY 36 P.M. 29.17
 HUMBOLDT COUNTY, CALIFORNIA

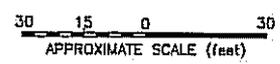
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 SANTA ROSA, CA



EXPLANATION

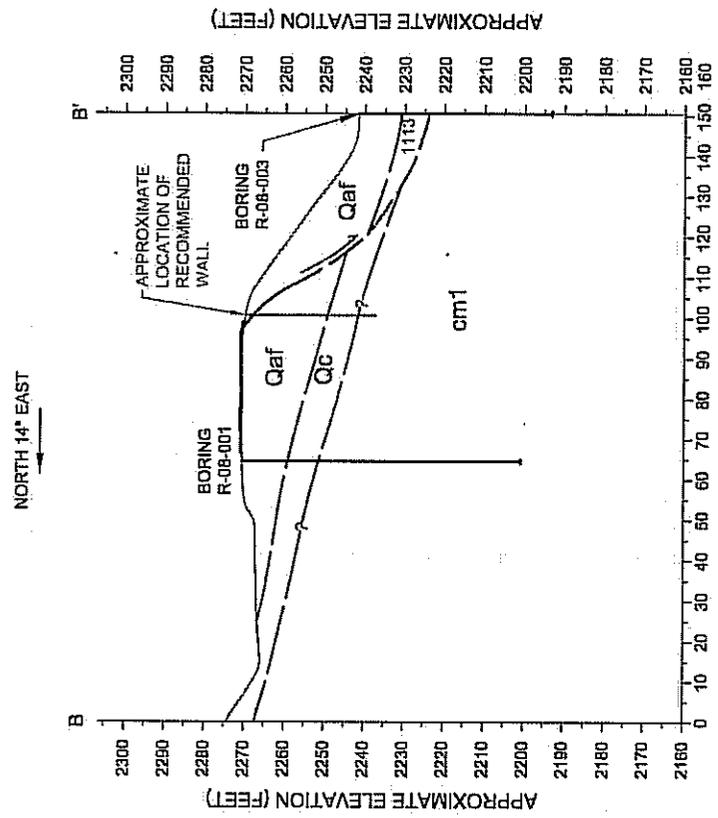
- Qaf Artificial Fill
- Qc Colluvium
- cm1 Central Belt Franciscan Complex: Melange
- Geologic Contact (dashed where approximate)
- Landslide Boundary (dashed where approximate)
- Landslide Identification Number (reference landslide identification chart)



NOTE:
 Section was hand field surveyed and may differ from the topography and mapping as shown on the site plan, Plate 2.

This document is included in the project's electronic files and is subject to change without notice. It is intended for use as a reference only and should not be used as a basis for any construction or other project. The user of this document is responsible for ensuring the accuracy of the information contained herein. The user of this document is responsible for ensuring the accuracy of the information contained herein.

 Bright People. Right Solutions. www.kleinfelder.com	PROJECT NO: 92859 DRAWN: JULY 2008 DRAWN BY: PH CHECKED BY: JR FILE NAME: 92859-2.dwg	SECTION A - A' EA 01-475601 HIGHWAY 38 P.M. 29.17 HUMBOLDT COUNTY, CALIFORNIA	PLATE 3
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EXPLANATION

- Qaf Artificial Fill
- Qc Colluvium
- cm1 Central Belt Franciscan Complex Melange
- (dashed where approximate) Geologic Contact
- (dashed where approximate) Landslide Boundary
- (reference landslide identification chart) Landslide Identification Number



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NOTE:
Section was hand field surveyed and may differ from the topography and mapping as shown on the site plan, Plate 2.

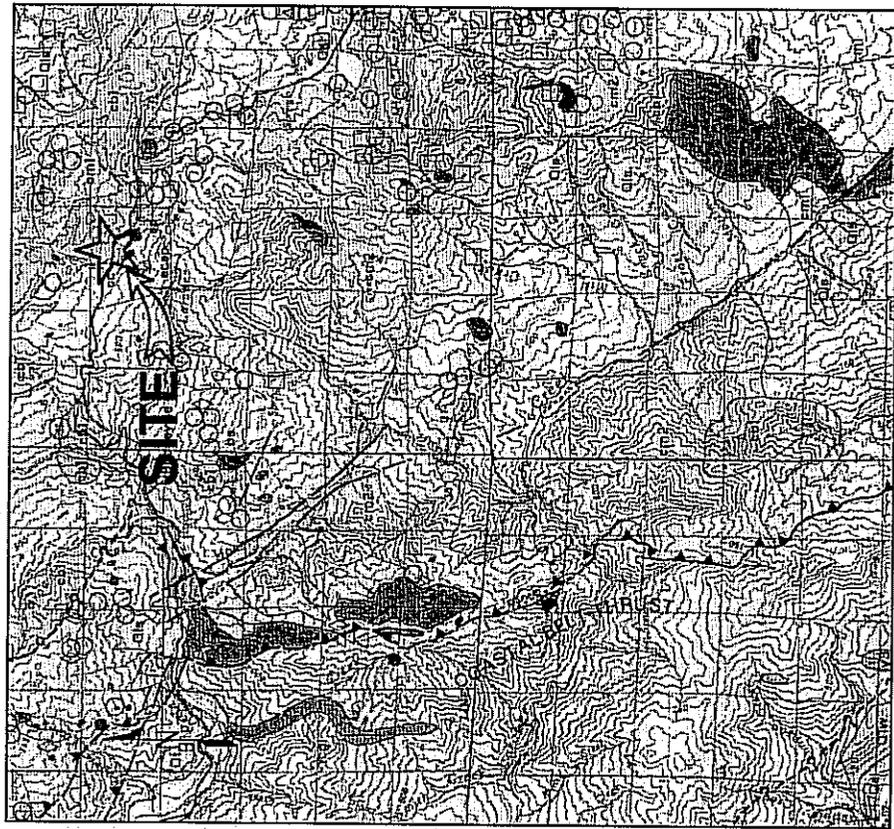
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CHECKED BY: JR		
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	HIGHWAY 36 P.M. 20.17	
	HUMBOLDT COUNTY, CALIFORNIA	

MAP SYMBOLS

	Contact-Diphal where approximate, dotted where concealed, queried where uncertain
	Fault-Diphal where approximate, dotted where concealed, queried where uncertain
	Thrust fault-thrust in upper plate, dashed where approximate, dotted where concealed, queried where uncertain
	Trace of the San Andreas fault associated with 1906 earthquake rupture-dashed where approximate, queried where uncertain
	Strike and dip of bedding
	Inclined-dip denotes top of beds is known from sedimentary features
	Vertical-dip denotes top of beds is known from sedimentary features horizontal
	Overtured-dip denotes that top of beds is known from sedimentary features
	Approximate-based on plain interpretation or estimated dip in field
	Joint-Strike and dip of joint
	Strike and dip of cleavage-dip denotes that top of flow is known from sedimentary or volcanic features
	Shear fold-shear
	Inclined
	Vertical
	Folds:
	Synclinal or synformal axis-showing direction of plunge
	Anticlinal or antiformal axis-showing direction of plunge
	Overtured syncline
	Landslide-Arrows indicate direction of movement
	Mixture blocks:
	Serpentine
	Chert
	Blueschist
	Greenstone
	Fault locality and number

EXPLANATION

	Alluvial deposits (Holocene and Late Pleistocene?)
	Undifferentiated sediment for terrace-deposits (Holocene and Pleistocene)
	Landfill deposits (Holocene and Pleistocene)
	Marine and nonmarine overlap deposits (late Pleistocene to middle Holocene)
	Shattered and highly folded mudstone
	Highly folded limonite mudstone, sandstone, and conglomerate sandstone
	Conglomerate
	Alluvium
	Alluvium
	Broken Formations-Contact of bedrock
	White rock metamorphosis of 14 Ma and others (1989) (Pliocene and late Late Cretaceous)
	Chert (Late Cretaceous to Early Jurassic)
	Basaltic rocks (Cretaceous and Jurassic)
	Mixture block, lithology unknown
	Serpentine



8,000 4000 0 8,000
 APPROXIMATE SCALE (feet)

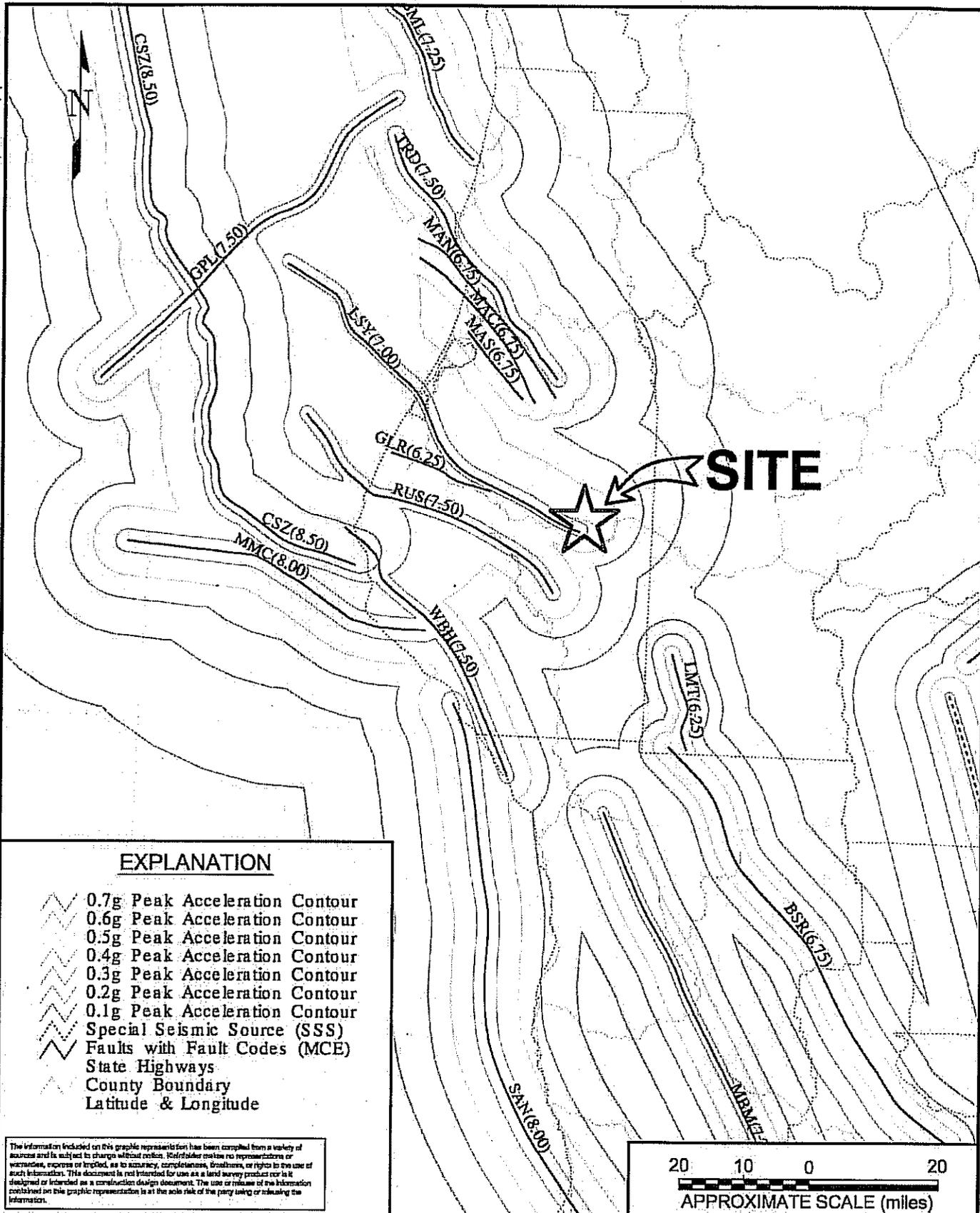
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PROJECT NO.	92359	REGIONAL GEOLOGY	PLATE
DRAWN BY:	JULY 2008		
CHECKED BY:	PH		
FILE NAME:	JR		5

EA 01-475001
 HIGHWAY 20 P.M. 20-17
 HUMBOLDT COUNTY, CALIFORNIA

Reference: R.J. McLaughlin et al., 2000

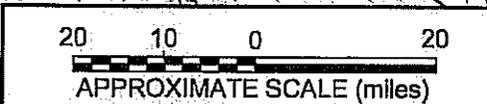
ATTACHED IMAGES: HzdMap96 copy.jpg
 ATTACHED XREFS: PLEASANTON, CA
 CAD FILE: U:\GEOTECH_PROJECTS\Projects\Active\192859 Caltrans TO# 58916\HUM-36 PM 29.17\CAD\ LAYOUT: Layout1 PLOTTED: 09 Jul 2008, 9:31am, phubbard



EXPLANATION

- 0.7g Peak Acceleration Contour
- 0.6g Peak Acceleration Contour
- 0.5g Peak Acceleration Contour
- 0.4g Peak Acceleration Contour
- 0.3g Peak Acceleration Contour
- 0.2g Peak Acceleration Contour
- 0.1g Peak Acceleration Contour
- Special Seismic Source (SSS)
- Faults with Fault Codes (MCE)
- State Highways
- County Boundary
- Latitude & Longitude

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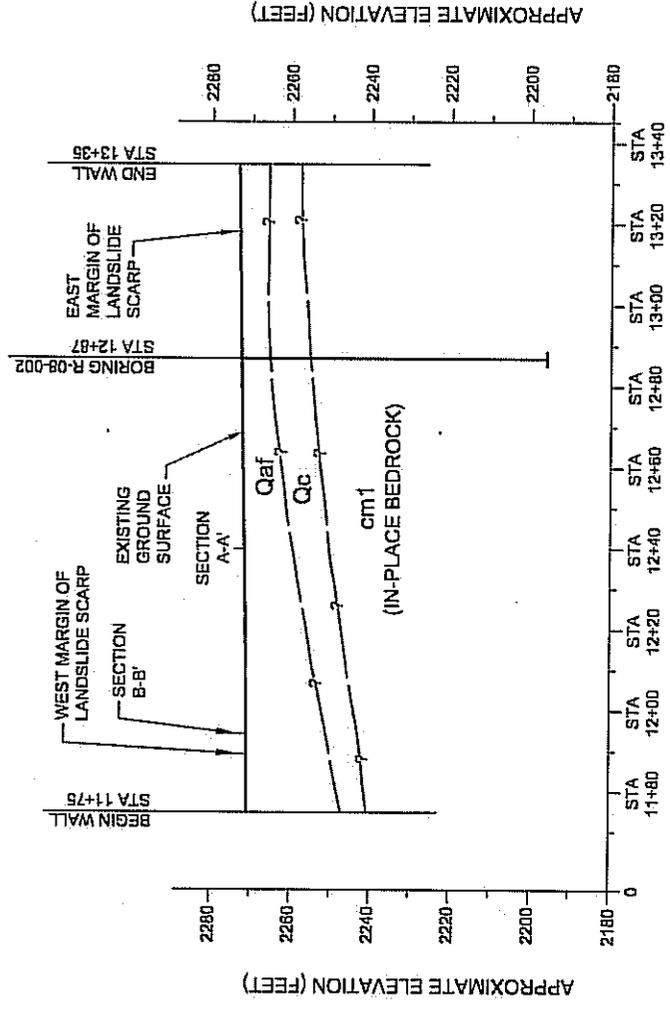
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PROJECT NO.	92859
DRAWN:	JULY 2008
DRAWN BY:	PH
CHECKED BY:	JR
FILE NAME:	92859-5.dwg

CALIFORNIA SEISMIC HAZARD MAP (MUALCHIN 1996)

EA 01-475601
 HIGHWAY 36 P.M. 29.17
 HUMBOLDT COUNTY, CALIFORNIA

PLATE
6



APPROXIMATE STATIONING (FEET)

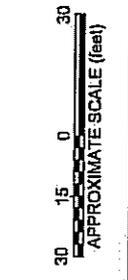
EXPLANATION

- Qaf Artificial Fill
- Qc Colluvium
- cm1 Central Belt Franciscan Complex
Melange
- Geologic Contact
(dashed where approximate)
- Landslide Boundary
(dashed where approximate)
- Landslide Identification Number
(reference landslides identification chart)



1112

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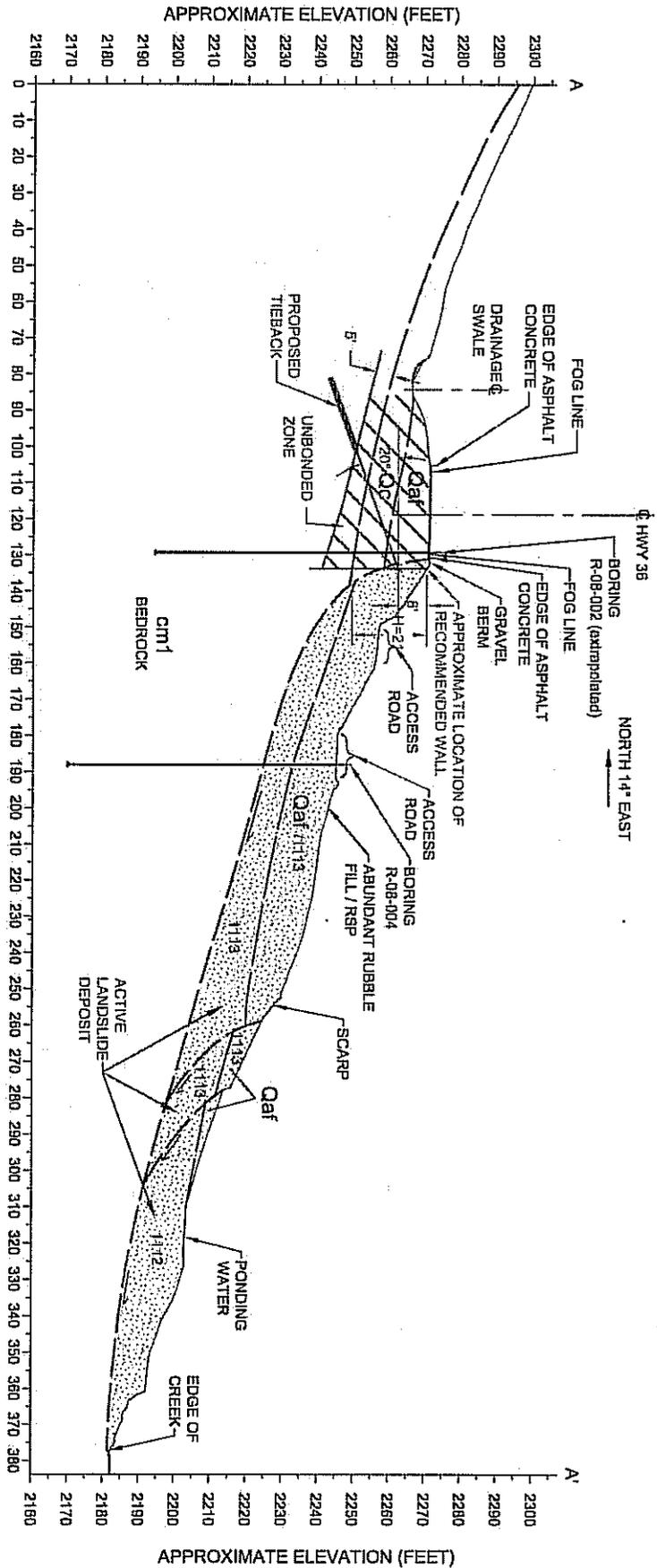


PROJECT NO: 021808
 DRAWN: JULY 2008
 DRAWN BY: PH
 CHECKED BY: JR
 FILE NAME: 021808-dwg

APPROXIMATE SUBSURFACE GEOLOGY ALONG WALL

PLATE **7**

EA 01-475801
 HIGHWAY 36 P.M. 20.17
 HUMBOLDT COUNTY, CALIFORNIA



EXPLANATION

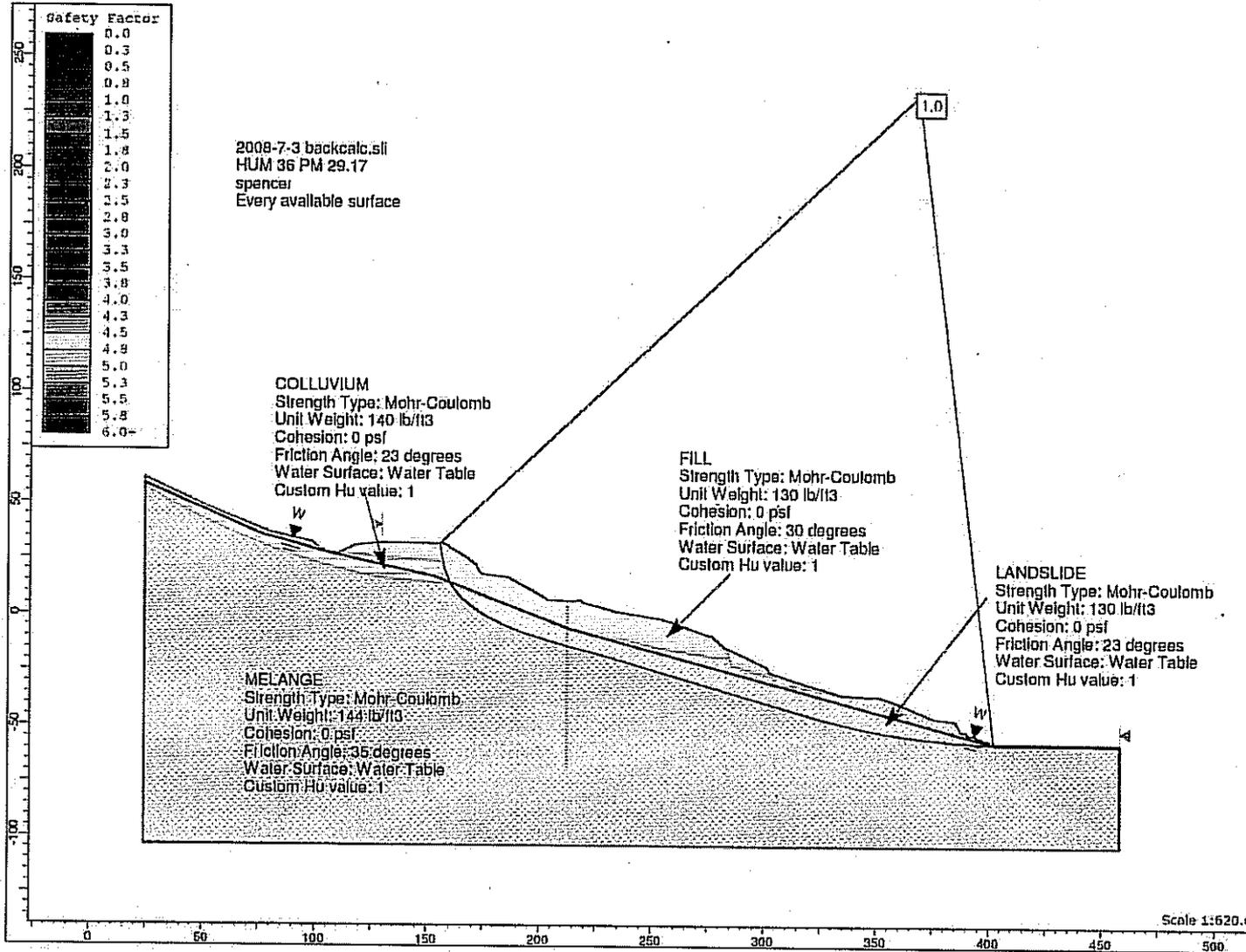
Qaf	Artificial Fill	(S)	Geologic Contact (dashed where approximate)
Qc	Colluvium	(S)	Landslide Boundary (dashed where approximate)
cm1	Central Bell Franciscan Complex Melange	(S)	Landslide Identification Number (reference landslide identification chart)



NOTE:
 Section was hand field surveyed and may differ from the
 topography and mapping as shown on the site plan, Plate 2.



PROJECT NO.	92859	TIEBACK UNBONDED ZONE SECTION A - A'	PLATE 8
DRAWN BY:	PH		
CHECKED BY:	JR	EA 01-17501 HIGHWAY 36 P.M. 28.17 HUMBOLDT COUNTY, CALIFORNIA	
FILE NAME:	92859-10.dwg		
DRAWN:	JULY 2008		



PROJECT NO.: 92859

DATE: JULY 08

BY: CMG

CHECKED BY: TC

SLOPE STABILITY: CROSS SECTION A-A: BACK-CALCULATION BLOCK FAILURE

EXISTING CONDITIONS, STATIC ANALYSIS

EA # 475601

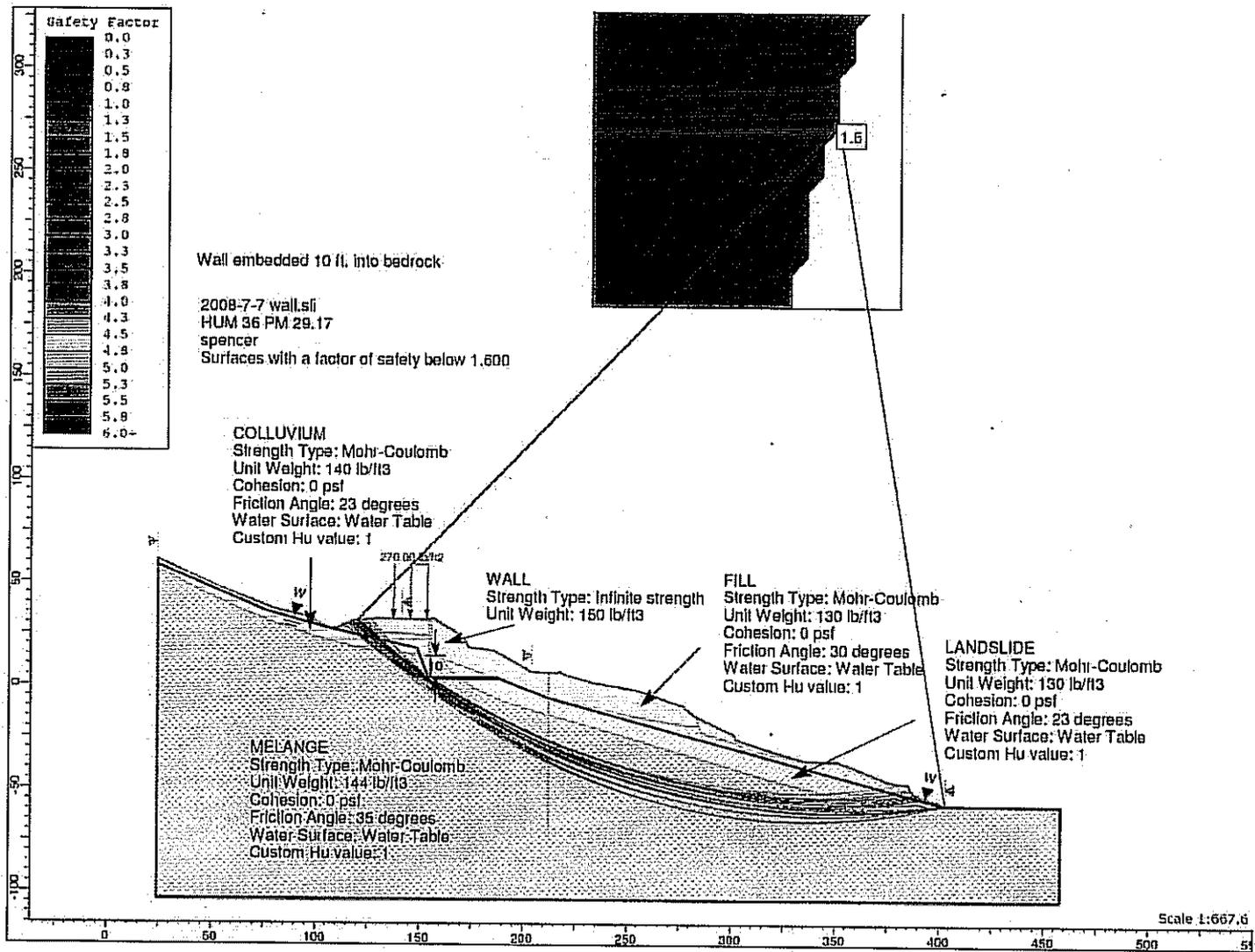
01-HUM-36-29.17

HIGHWAY 36 P.M. 29.17

HUMBOLDT COUNTY, CALIFORNIA

PLATE

10

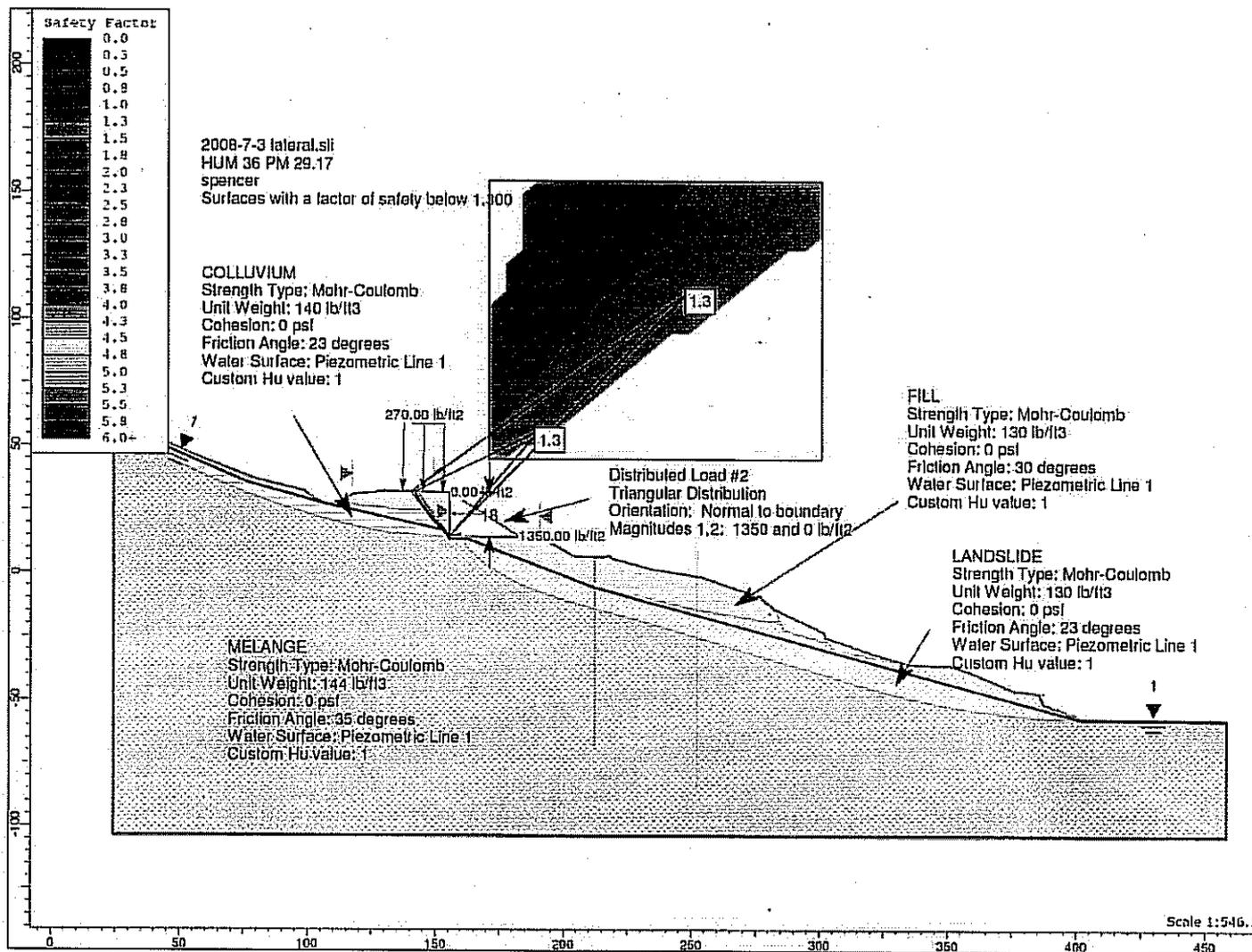


PROJECT NO.: 92859
DATE: JULY 08
BY: CMG
CHECKED BY: TC

SLOPE STABILITY: CROSS SECTION A-A': WITH WALL (10 FT. INTO BEDROCK)
IMPROVED CONDITIONS, STATIC ANALYSIS:
EA # 475601
01-HUM-36-29.17
HIGHWAY 36 P.M. 29.17
HUMBOLDT COUNTY, CALIFORNIA

PLATE

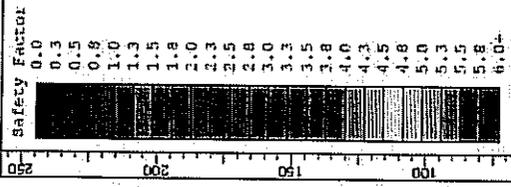
11



PROJECT NO.: 02859
DATE: JULY 08
BY: CMG
CHECKED BY: TC

SLOPE STABILITY: CROSS SECTION A-A': LATERAL PRESSURE
IMPROVED CONDITIONS, STATIC ANALYSIS
EA # 475601
01-HUM-36-29.17
HIGHWAY 36 P.M. 29.17
HUMBOLDT COUNTY, CALIFORNIA

PLATE
12



Wall embedded 10 ft. into bedrock
 2008-7-7 downslope.sli
 HUM 36 PM 29.17
 Spencer
 Every available surface

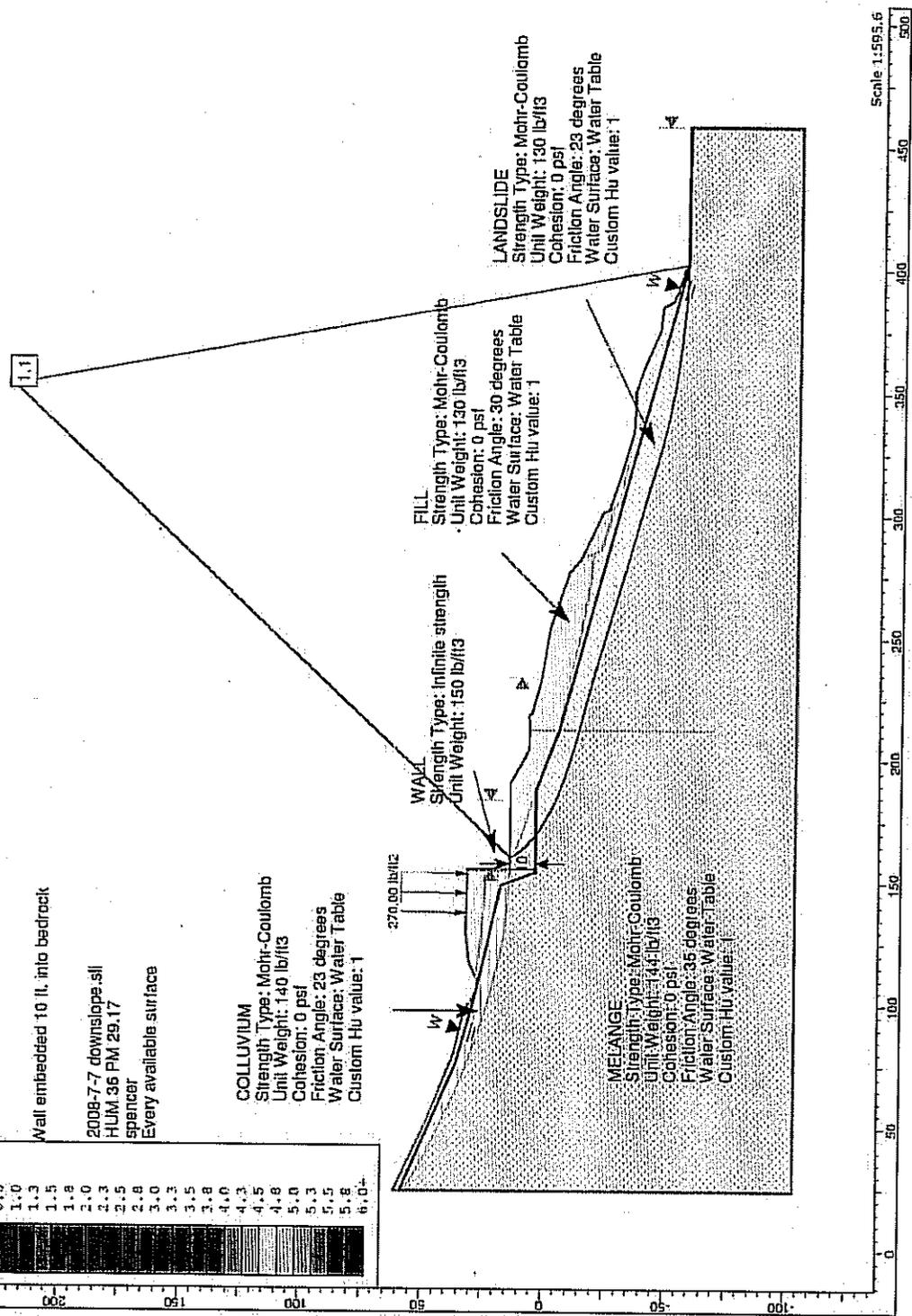
COLLUVIUM
 Strength Type: Mohr-Coulomb
 Unit Weight: 140 lb/ft³
 Cohesion: 0 psf
 Friction Angle: 23 degrees
 Water Surface: Water Table
 Custom Hu value: 1

WALL
 Strength Type: Infinite strength
 Unit Weight: 150 lb/ft³

FILL
 Strength Type: Mohr-Coulomb
 Unit Weight: 130 lb/ft³
 Cohesion: 0 psf
 Friction Angle: 30 degrees
 Water Surface: Water Table
 Custom Hu value: 1

LANDSLIDE
 Strength Type: Mohr-Coulomb
 Unit Weight: 130 lb/ft³
 Cohesion: 0 psf
 Friction Angle: 23 degrees
 Water Surface: Water Table
 Custom Hu value: 1

MELANGE
 Strength Type: Mohr-Coulomb
 Unit Weight: 140 lb/ft³
 Cohesion: 0 psf
 Friction Angle: 35 degrees
 Water Surface: Water Table
 Custom Hu value: 1



Scale 1:1595.6

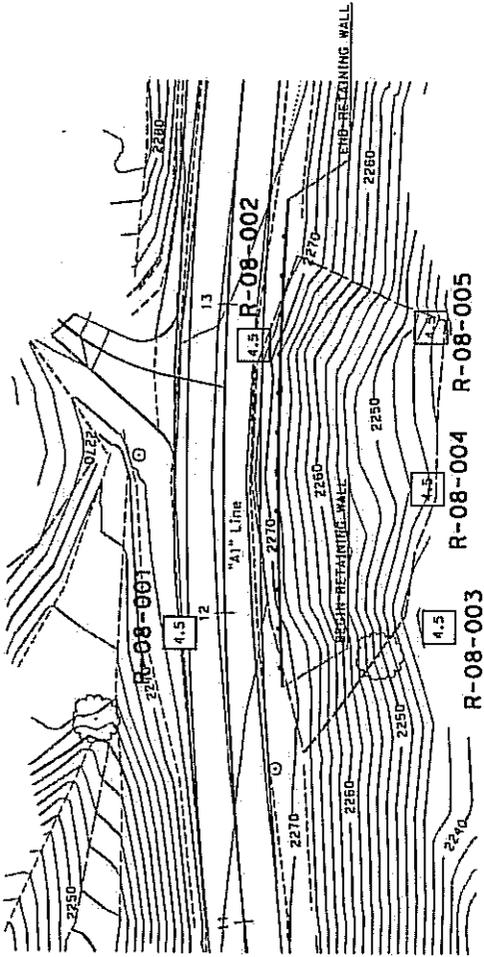
SLOPE STABILITY: CROSS SECTION A-A: DOWNSLOPE

IMPROVED CONDITIONS, STATIC ANALYSIS
 EA # 475601
 01-HUM-96-29.17
 HIGHWAY 36 P.M. 29.17
 HUMBOLDT COUNTY, CALIFORNIA

PROJECT NO.:	92859
DATE:	JULY 08
BY:	CMG
CHECKED BY:	TC



APPENDIX A



PLAN
1"=20'

Notes:

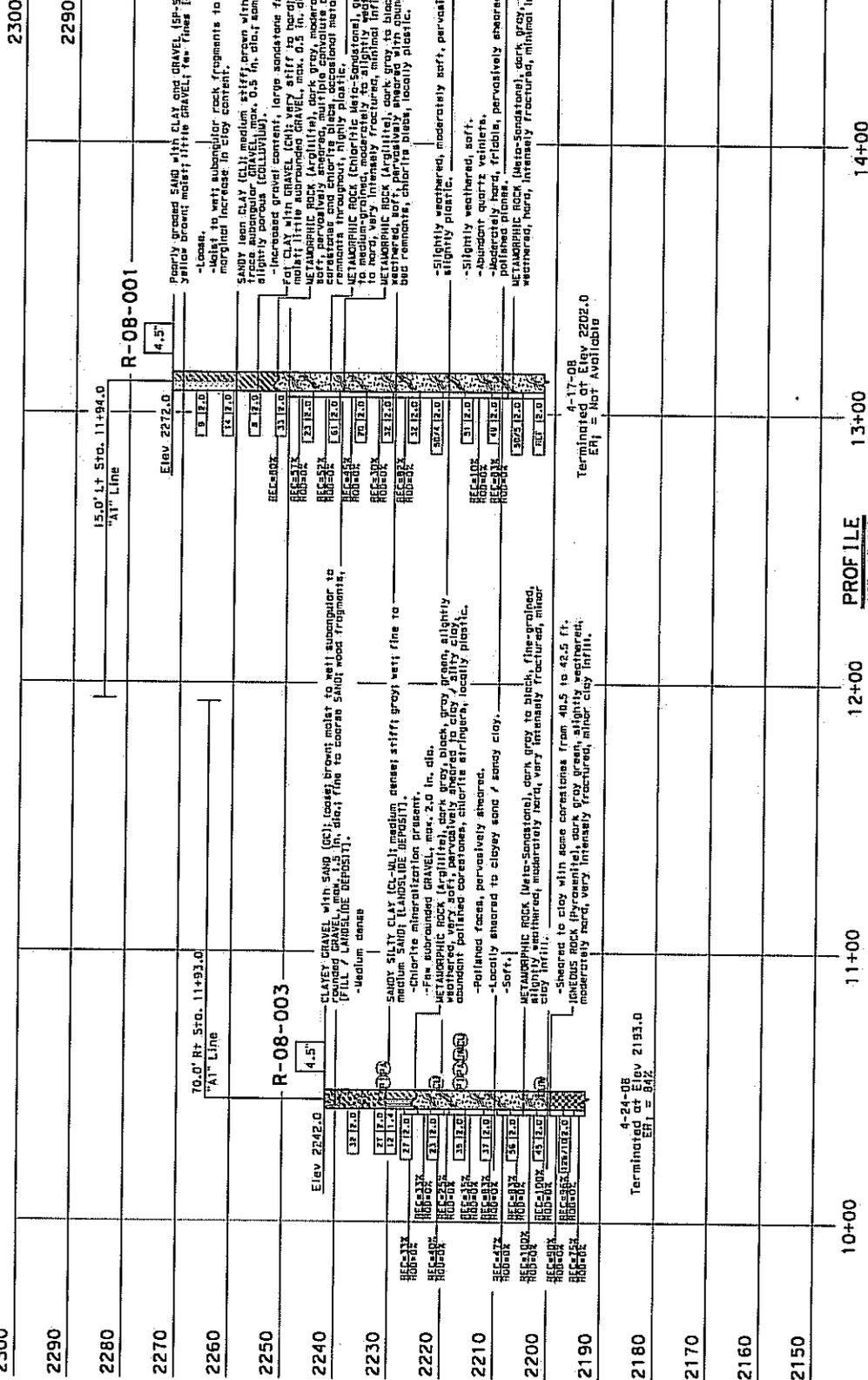
- 2" samples were taken using a modified California Sampler with an inside diameter (I.D.) of 2" and an outside diameter (O.D.) of 2.5".
- 40 automatic hammer (140 lb) with a 30" drop was used to advance the sampler.
- Blowcounts noted for boring are field blowcounts and have not been corrected.
- 1.4" samples were taken using a SPT split-barre sampler with an inside diameter (I.D.) of 1.4" and an outside diameter of 2".
- Blowcounts 50/5 means 50 blows per 5" penetration.
- Efficiency factor for CME automatic hammer is 1.1.
- This LOGS sheet was prepared in accordance with the California Soil Rock Logging Classification, and Presentation Manual (June 2007)

STATE	COUNTY	ROUTE	POST MILES	SHEET NO.
CA	Humboldt	36	29.0/29.3	
REGISTERED GEOLOGIST 				
PLANS APPROVAL DATE The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet. KLEINFELDER 2240 NORTHPOINT PARK SANTA ROSA, CA 95407				

DESIGN OVERSIGHT ENGINEER	STATE OF CALIFORNIA	POST MILES	SHEET NO.
FUNCTIONAL SUPERVISOR	DEPARTMENT OF TRANSPORTATION	29.0/29.3	
NAME	PREPARED FOR THE	RETAINING WALL @ POST MILE 29.2	
DATE	STATE OF CALIFORNIA	LOG OF TEST BORINGS 1 of 7	
APR 1 2008	DEPARTMENT OF TRANSPORTATION		
J. RICHMOND, C. GOTTIEN	PROJECT ENGINEER		
APR 1 2008	CU		
APR 1 2008	E.A. 4125601		

NOTE: This LOGS sheet was prepared in accordance with the California Soil & Rock Logging Classification, and Presentation Manual (June 2007)

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 1 OF 7



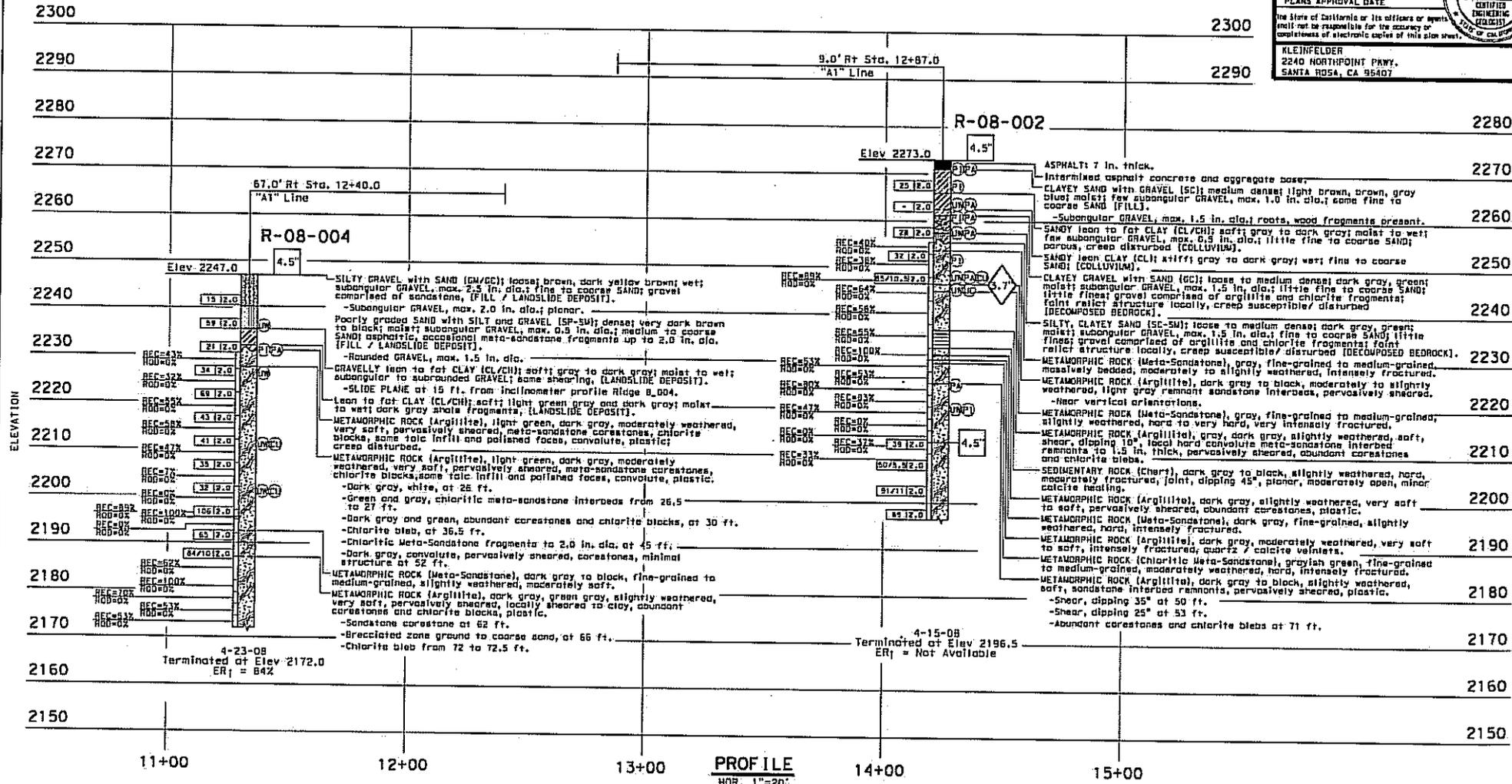
DIST COUNTY ROUTE DIST SHEETS
 Q1 Hum 36 29.0/29.3
 REGISTERED GEOLOGIST
 PLANS APPROVAL DATE
 The State Engineer or his authorized agent shall not be held responsible for the accuracy or completeness of electronic copies of this plan sheet.
 2240 NORTHPOINT PKWY.
 SAN JOSE, CA 95107

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
 PROJECT ENGINEER
 PROJECT NO. 29.0/29.3
 LOG OF TEST BORINGS 2 of 7
 DRAWN BY: A. Sanchez
 CHECKED BY: W. McCormick
 FIELD INVESTIGATION BY: C. Galvan, J. Alvarado
 DATE: April 1, 2008
 SCALE: 1"=20' HOR., 1"=10' VER.
 4-17-08
 Terminated at Elev 2202.0
 ERI = Not Available
 4-24-08
 Terminated at Elev 2193.0
 ERI = 84%
 10+00 11+00 12+00 13+00 14+00
 PROFILE
 HOR. 1"=20'
 VER. 1"=10'
 2300 2290 2280 2270 2260 2250 2240 2230 2220 2210 2200 2190 2180 2170 2160 2150
 ELEVATION

NOTE: This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, and Presentation Manual (June 2007)

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 1 OF 7

DIET	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS
01	Hum	36	29.0/29.3	
REGISTERED GEOLOGIST DATE 10-08 WILLIAM J. MCGUIRE III No. 1133 Exp. 11-30-2011 CIVIL ENGINEERING (22423)				REGISTERED ENGINEER DATE 10-08 WILLIAM J. MCGUIRE III No. 1133 Exp. 11-30-2011 CIVIL ENGINEERING (22423)
PLANS APPROVAL DATE				
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.				
KLEINFELDER 2240 NORTHPOINT Pkwy. SANTA ROSA, CA 95407				



DESIGN OVERSIGHT ENGINEER:	SIGN OFF DATE:	PREPARED FOR THE STATE OF CALIFORNIA	PROJECT ENGINEER:
FUNCTIONAL SUPERVISOR:	DRAWN BY: A. Sanchez	DEPARTMENT OF TRANSPORTATION	PROJECT NO.:
NAME:	CHECKED BY: W. McCormick	FIELD INVESTIGATION BY: C. Gelfin, J. Richmond April 2008	POST MILES: 29.0/29.3
CIVIL LOG OF TEST BORINGS SHEET		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS	DATE: 10-08
RETAINING WALL @ POST MILE 29.2		CU: CA 475601	LOG OF TEST BORINGS 3 of 7

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (June 2007)

DIST	COUNTY	ROUTE	POST MILE TOTAL PROJECT	SHEET NO.	TOTAL SHEET
01	HUM	36	29.0/29.3		

REGISTERED GEOLOGIST
 DATE: 10-09-10
 REGISTERED GEOLOGIST
 WILLIAM W. WILSON, III
 No. 115252
 CERTIFIED ENGINEERING GEOLOGIST
 STATE OF CALIFORNIA

PLANS APPROVAL DATE: _____
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KLEINFELDER
 2240 NORTHPOINT PARK
 SANTA ROSA, CA 95407

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$REC = \frac{\sum \text{Length of the recovered core pieces (inches)}}{\text{Total length of core run (inches)}} \times 100\%$

$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4''}{\text{Total length of core run (inches)}} \times 100\%$

RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (PSI)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8" to 1 ft
Thinly bedded	1-1/4" to 3-5/8"
Very thinly bedded	3/8" to 1-1/4"
Laminated	Less than 3/8"

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 1/8" deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic Features				General Characteristics	
	Chemical Weathering-Discoloration and/or oxidation		Mechanical Weathering-Grain boundary conditions (disaggregation) primarily for granitics and some coarse-grained sediments	Texture and Solubilizing		
	Body of Rock	Fracture Surfaces		Texture		Solubilizing
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solubilizing.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semi-arid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or veinlike fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

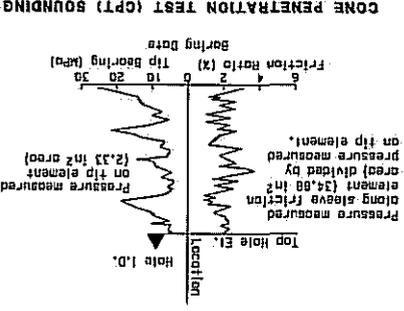
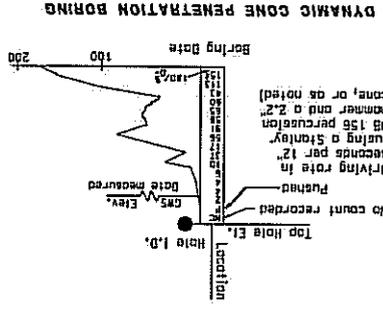
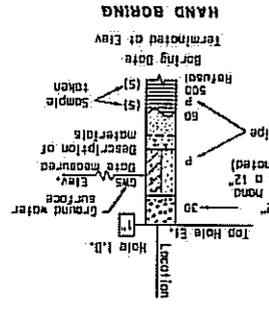
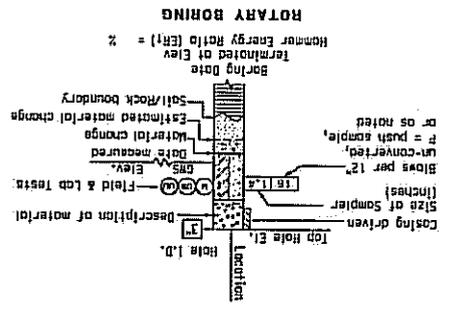
Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic features. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 3 feet.
Slightly fractured	Lengths from 1 to 3 feet with few lengths less than 1 foot or greater than 3 feet.
Moderately fractured	Lengths mostly in 4" to 1 foot range with most lengths about 8"
Intensely fractured	Lengths average from 1 to 4" with scattered fragmented intervals with lengths less than 4"
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

DESIGN OVERSIGHT ENGINEER:	SIGN OFF DATE:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER:	PROJECT NO. 23.0/23.3	ROCK LEGEND @ POST MILE 29.2
				POST MILE 29.0/29.3	LOG OF TEST BORINGS 5 of 7
				PREPARED BY W. McCornick	



BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
	A	Auger Boring
	R	Rotary percussion boring (dr)
	R	Rotary drilled boring
	HA	Hand Auger
	HD	Hand driven (1-inch soil tube)
	D	Dynamic Cone Penetration Boring
	CPT	Core Penetration Test (ASTM D 5775-95)
	O	Other

Note: Size in inches.

CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

PLASTICITY OF FINE-GRAINED SOILS

Description	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CONSISTENCY OF COHESIVE SOILS

Description	Unconfined Compressive Strength (tsf)	Pocket Penetrometer Measurement (tsf)	Torvane Measurement (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Very soft
Soft	0.25 to 0.50	0.25 to 0.50	0.12 to 0.25	Soft
Medium Stiff	0.50 to 1.0	0.50 to 1.0	0.25 to 0.50	Medium Stiff
Stiff	1 to 2	1 to 2	0.50 to 1.0	Stiff
Very Stiff	2 to 4	2 to 4	1.0 to 2.0	Very Stiff
Hard	> 4.0	> 4.0	> 2.0	Hard

REGISTERED GEOLOGIST
 DATE: 11-10-06
 PLANS APPROVAL DATE: 11-10-06
 STATE OF CALIFORNIA
 KLEINFELDER
 2240 HORTHORST PARK,
 SAN RAFAEL, CA 94907

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (June 2007)

GROUP SYMBOLS AND NAMES			
Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
	GW Well-graded GRAVEL		CL Lean CLAY
	GW Well-graded GRAVEL with SAND		CL Lean CLAY with SAND
	GP Poorly graded GRAVEL		CL SANDY lean CLAY
	GP Poorly graded GRAVEL with SAND		CL GRAVELLY lean CLAY
	GW-GM Well-graded GRAVEL with SILT		ML SILTY CLAY
	GW-GM Well-graded GRAVEL with SILT and SAND		ML SILTY CLAY with GRAVEL
	GW-GC Well-graded GRAVEL with CLAY		OL SANDY SILTY CLAY with GRAVEL
	GW-GC Well-graded GRAVEL with CLAY and SAND		OL GRAVELLY SILTY CLAY
	GP-GM Poorly graded GRAVEL with SILT		OH ORGANIC lean CLAY
	GP-GM Poorly graded GRAVEL with SILT and SAND		OH ORGANIC lean CLAY with SAND
	GP-GC Poorly graded GRAVEL with CLAY		MH SANDY ORGANIC SILT
	GP-GC Poorly graded GRAVEL with CLAY and SAND		MH GRAVELLY ORGANIC SILT
	GM SILTY GRAVEL		OH SANDY ORGANIC fat CLAY
	GM SILTY GRAVEL with SAND		OH SANDY ORGANIC fat CLAY with GRAVEL
	GC CLAYEY GRAVEL		OH GRAVELLY ORGANIC fat CLAY
	GC CLAYEY GRAVEL with SAND		OH GRAVELLY ORGANIC fat CLAY with SAND
	GC-GM SILTY, CLAYEY GRAVEL		OH ORGANIC elastic SILT
	GC-GM SILTY, CLAYEY GRAVEL with SAND		OH ORGANIC elastic SILT with SAND
	SW Well-graded SAND		CH Fat CLAY
	SW Well-graded SAND with GRAVEL		CH Fat CLAY with GRAVEL
	SP Poorly graded SAND		MH SANDY fat CLAY
	SP Poorly graded SAND with GRAVEL		MH SANDY fat CLAY with GRAVEL
	SW-SM Well-graded SAND with SILT		OH ORGANIC elastic SILT
	SW-SM Well-graded SAND with SILT and GRAVEL		OH ORGANIC elastic SILT with GRAVEL
	SW-SC Well-graded SAND with CLAY		OH SANDY ORGANIC elastic SILT
	SW-SC Well-graded SAND with CLAY and GRAVEL		OH SANDY ORGANIC elastic SILT with GRAVEL
	SP-SM Poorly graded SAND with SILT		OH GRAVELLY ORGANIC elastic SILT
	SP-SM Poorly graded SAND with SILT and GRAVEL		OH GRAVELLY ORGANIC elastic SILT with SAND
	SP-SC Poorly graded SAND with CLAY		OH ORGANIC fat CLAY
	SP-SC Poorly graded SAND with CLAY and GRAVEL		OH ORGANIC fat CLAY with GRAVEL
	SM SILTY SAND		OH SANDY ORGANIC fat CLAY
	SM SILTY SAND with GRAVEL		OH SANDY ORGANIC fat CLAY with GRAVEL
	SC CLAYEY SAND		OH GRAVELLY ORGANIC fat CLAY
	SC CLAYEY SAND with GRAVEL		OH GRAVELLY ORGANIC fat CLAY with SAND
	SC-SM SILTY, CLAYEY SAND		OH ORGANIC elastic SILT
	SC-SM SILTY, CLAYEY SAND with GRAVEL		OH ORGANIC elastic SILT with GRAVEL
	PT PEAT		OL/OH ORGANIC SOIL
	PT PEAT		OL/OH ORGANIC SOIL with SAND
	COBBLES		OL/OH SANDY ORGANIC SOIL
	BOULDERS		OL/OH SANDY ORGANIC SOIL with GRAVEL
	COBBLES		OL/OH GRAVELLY ORGANIC SOIL
	BOULDERS		OL/OH GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166)
- (UR) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2950)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Humboldt	36	29.0/29.3		

REGISTERED GEOLOGIST DATE 10-08

PLANS APPROVAL DATE

WILLIAM T. MCCORMICK, III
 CIVIL ENGINEER
 STATE OF CALIFORNIA

RLEINFELDER
 2240 NORTHPOINT PAVY,
 SANTA ROSA, CA 95401

APPARENT DENSITY OF COHESIONLESS SOILS	
Description	SPT N ₆₀ (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE	
Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS	
Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE		
Description	Size	
Boulder	> 12"	
Cobble	3" to 12"	
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

DESIGN OVERSIGHT ENGINEER:	SIGN OFF DATE:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER:	DATE: 29.0/29.3	SOIL LEGEND @ POST MILE 29.2
					LOG OF TEST BORINGS 7 of 7
PREPARED BY: A. Sanchez	CHECKED BY: W. McCormick	ORIGINAL SCALE IN INCHES FOR ALL PLAN SHEETS	CU EA 475601		

APPENDIX B

Highway 36 PM 29.17
Humboldt County, CA
EA # 01-475601

Soil/Rock Type	Boring	Depth (ft)	CU (psf)	CU (tsf)	UC (psf)	Confining Pressure (psf)	Dry density (pcf)	Moisture content (%)	Total density (pcf)	PI	LL	-200
FILL (SC)	R-08-002	2								15	30	39
FILL (SC)	R-08-002	6								21	37	
COLLUVIUM (CL)	R-08-002	10.5					125	12	141			51
COLLUVIUM (CL)	R-08-002	11.5								23	37	51
DECOMPOSED BR (SC-SM)	R-08-002	15.5										34
DECOMPOSED BR (SC-SM)	R-08-002	16					136	9	149			
ARGILLITE	R-08-002	21.5								21	33	
ARGILLITE	R-08-002	25.5										53
ARGILLITE	R-08-002	26	1666	0.8		1699	118	13	133			
META-SANDSTONE	R-08-002	27			432945		168	0	168			
ARGILLITE	R-08-002	48										30
ARGILLITE	R-08-002	53					140	7	149	11	26	
FILL/LS (GC)	R-08-003	11								20	34	
LS (CL-ML)	R-08-003	11.5										57
ARGILLITE	R-08-003	21	2811	1.4		1397						
ARGILLITE	R-08-003	25.5								24	40	59
ARGILLITE	R-08-003	26	2967	1.5		1699	128	12	143			
META-SANDSTONE	R-08-003	41					122	13	138			
FILL/LS (SP-SM)	R-08-004	11					127	7	136			
LS (CL/CH)	R-08-004	15										80
DIST? ARGILLITE	R-08-004	16								8	19	
ARGILLITE	R-08-004	21					126	13	142			
ARGILLITE	R-08-004	36	3494	1.7		2304	128	12	144			
ARGILLITE	R-08-004	46	1682	0.8		2995	123	14	140			
LS (SC)	R-08-005	6										41
LS (GC)	R-08-005	8										23
LS (CL)	R-08-005	10.5								16	33	
ARGILLITE	R-08-005	15.5										55
ARGILLITE	R-08-005	16	1402	0.7		1051	129	12	144			
ARGILLITE	R-08-005	31	1552	0.8		2002	129	11	143			

UC Unconfined Compressive Strength

CU Consolidated Undrained Triaxial

tsf tons per square foot

psf Pounds per square foot

LL Liquid Limit

-200 Percent Passing 200 Sieve

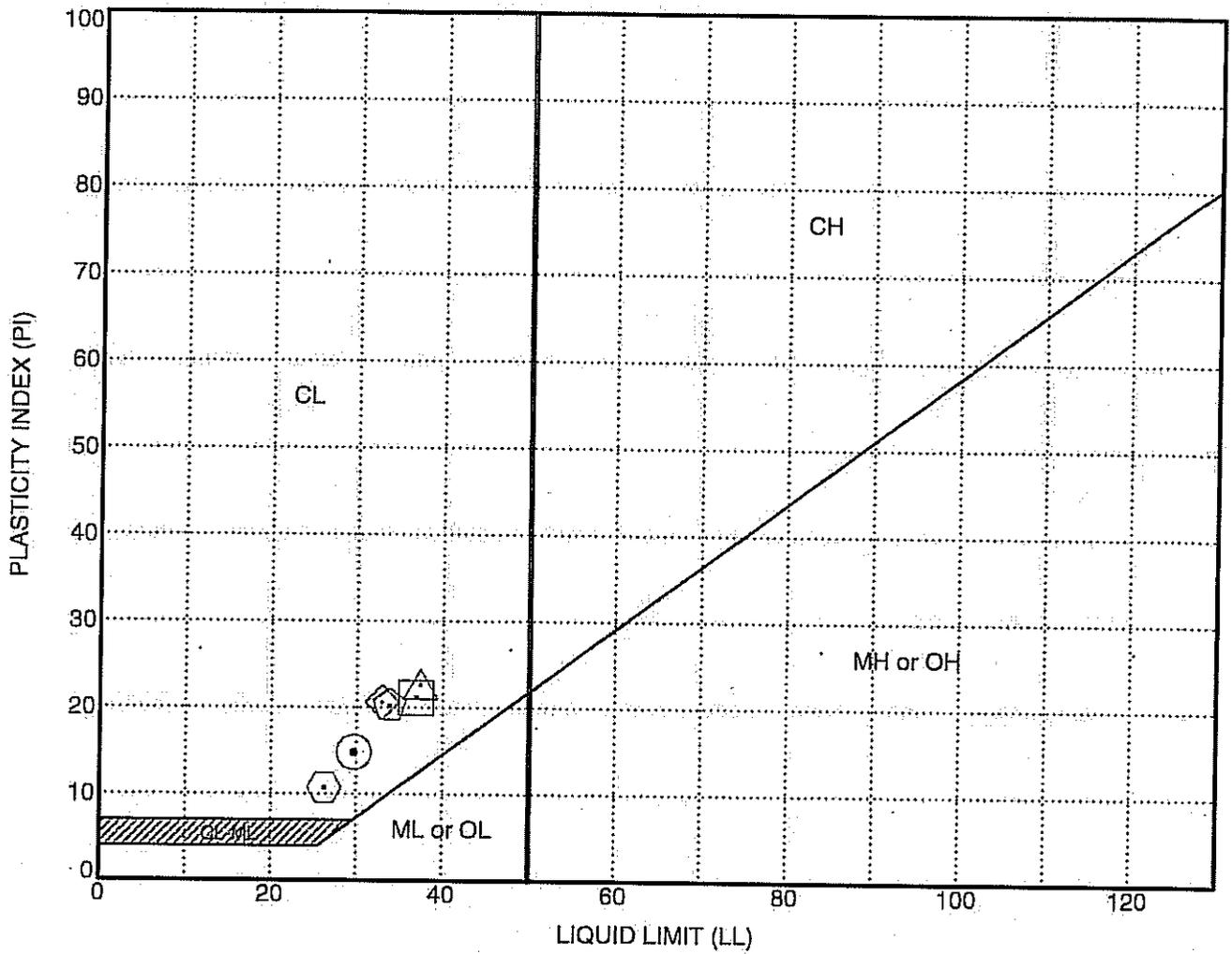
LS Landslide Deposit

DIST? Possibly Disturbed

BR Bedrock

PI Plasticity Index

Data Template: PI - KLEINFELDER SANTA ROSA 5-B-08_GDT - 6/30/08 16:30 - U:\NEW GINT PROJECTS\92858 CALTRANS TO# 569 1601-HUM-36-29.17 LAB TESTS.GPJ



SAMPLE SOURCE	CLASSIFICATION	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	% PASSING #200 SIEVE
⊙ R-08-002 @ 2.0'	CLAYEY SAND with GRAVEL (SC)	30	15	15	39
⊠ R-08-002 @ 6.0'	CLAYEY SAND with GRAVEL (SC)	37	16	21	
△ R-08-002 @ 11.5'	SANDY LEAN CLAY (CL)	37	15	22	51
◇ R-08-002 @ 21.5'	ARGILLITE	33	12	21	
⊙ R-08-002 @ 53.0'	ARGILLITE	26	15	11	
◇ R-08-003 @ 11.0'	CLAYEY GRAVEL with SAND (GC)	34	13	21	



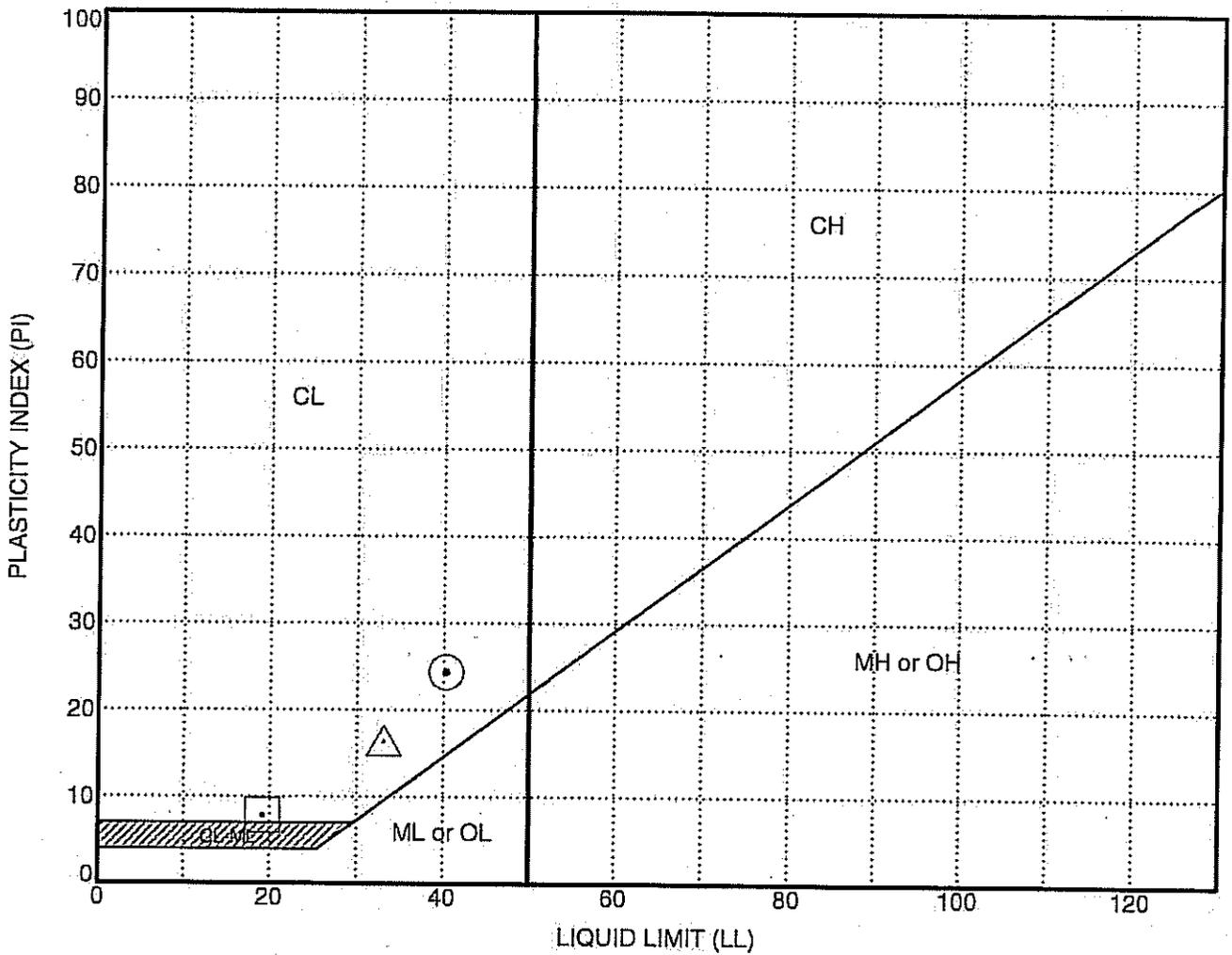
PLASTICITY CHART
 Highway 36 PM 29.17
 01-HUM-36-29.17
 Humboldt County, CA

PLATE

B-1

PROJECT NUMBER EA # 01-475601 DATE 6/30/2008

Data Template: PI - KLEINFELDER SANTA ROSA 5-8-08 (GDT - 6/30/08 16:30 - UNNEW GINT PROJECTS\92859 CALTRANS TOW 589\01-HUM-36-29.17\01-HUM-36-29.17 LAB TESTS.GPJ



SAMPLE SOURCE	CLASSIFICATION	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	% PASSING #200 SIEVE
⊙ R-08-003 @ 25.5	ARGILLITE	40	16	24	59
⊠ R-08-004 @ 16.0	ARGILLITE	19	11	8	
△ R-08-005 @ 10.5	SANDY LEAN CLAY (CL)	33	17	16	

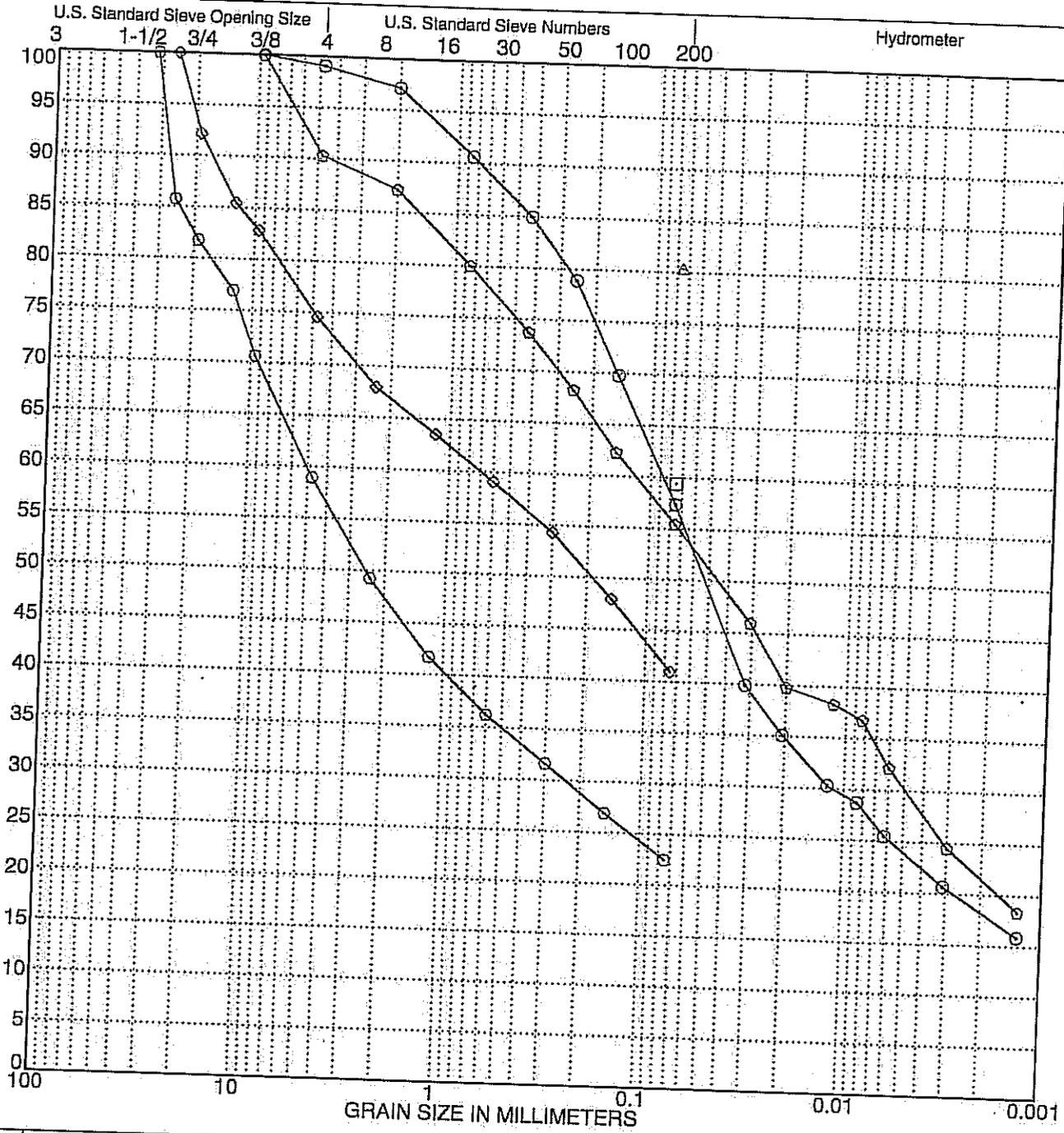


PROJECT NUMBER EA # 01-475601 DATE 6/30/2008

PLASTICITY CHART
 Highway 36 PM 29.17
 01-HUM-36-29.17
 Humboldt County, CA

PLATE
B-2

PERCENT FINER BY WEIGHT



Cobbles	GRAVEL		SAND			SILT	CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

SYMBOL	SAMPLE SOURCE	CLASSIFICATION
○	R-08-003 @ 11.5'	SANDY, SILTY CLAY (CL-ML) ARGILLITE
□	R-08-003 @ 25.5'	
△	R-08-004 @ 15.0'	LEAN to FAT CLAY (CL-CH)
◇	R-08-005 @ 6.0'	
⊙	R-08-005 @ 8.0'	CLAYEY SAND with GRAVEL (SC) CLAYEY GRAVEL with SAND (GC)
⊕	R-08-005 @ 15.5'	



PARTICLE SIZE ANALYSIS

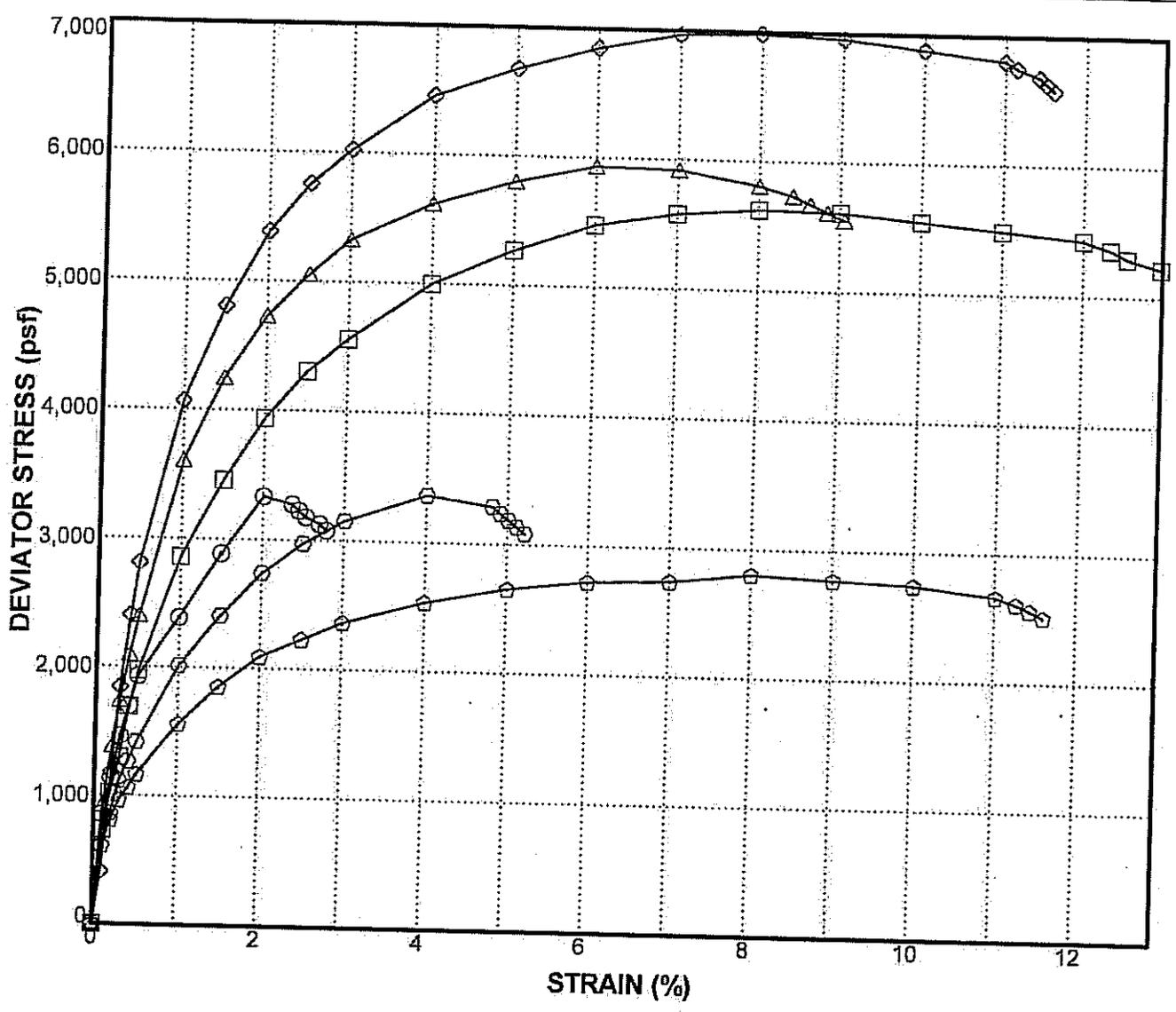
Highway 36 PM 29.17
01-HUM-36-29.17
Humboldt County, CA

PLATE
B-4

PROJECT NUMBER EA # 01-475601 DATE 6/30/2008

Data Template: SA - KLEINFELDER SANTA ROSA 5-5-08.GDT - 6/30/08 16:31 - UNNEW GINT PROJECTS\SUBBED CALTRANS TO\59916\01-HUM-36-29.17\01-HUM-36-29.17 LAB TESTS.GPJ

Data Template: NEW TX/UU - KLEINFELDER SANTA ROSA 5-8-08_GDT - 8/30/08 16:12 - U:\NEW GINT PROJECTS\92859 CALTRANS TO# 5891801-HUM-36-29.17 LAB TESTS.GPJ



Sample Source	Classification	Type of Test	Confinement Pressure (psf)	Shear Strength (psf)	Strain (%)	Dry Density (pcf)	Moisture Content (%)
○ R-08-002 @ 26.0'	ARGILLITE	TXCU	1699	1666	2	118	12.6
□ R-08-003 @ 27.0'	ARGILLITE	TXCU	1397	2811	8	n/a	n/a
△ R-08-003 @ 26.0'	ARGILLITE	TXCU	1699	2967	6	128	11.6
◇ R-08-004 @ 36.0'	ARGILLITE	TXCU	2304	3494	8	128	12.4
○ R-08-004 @ 46.0'	ARGILLITE	TXCU	2995	1682	4	123	14.2
○ R-08-005 @ 16.0'	ARGILLITE	TXCU	1051	1402	8	129	11.7

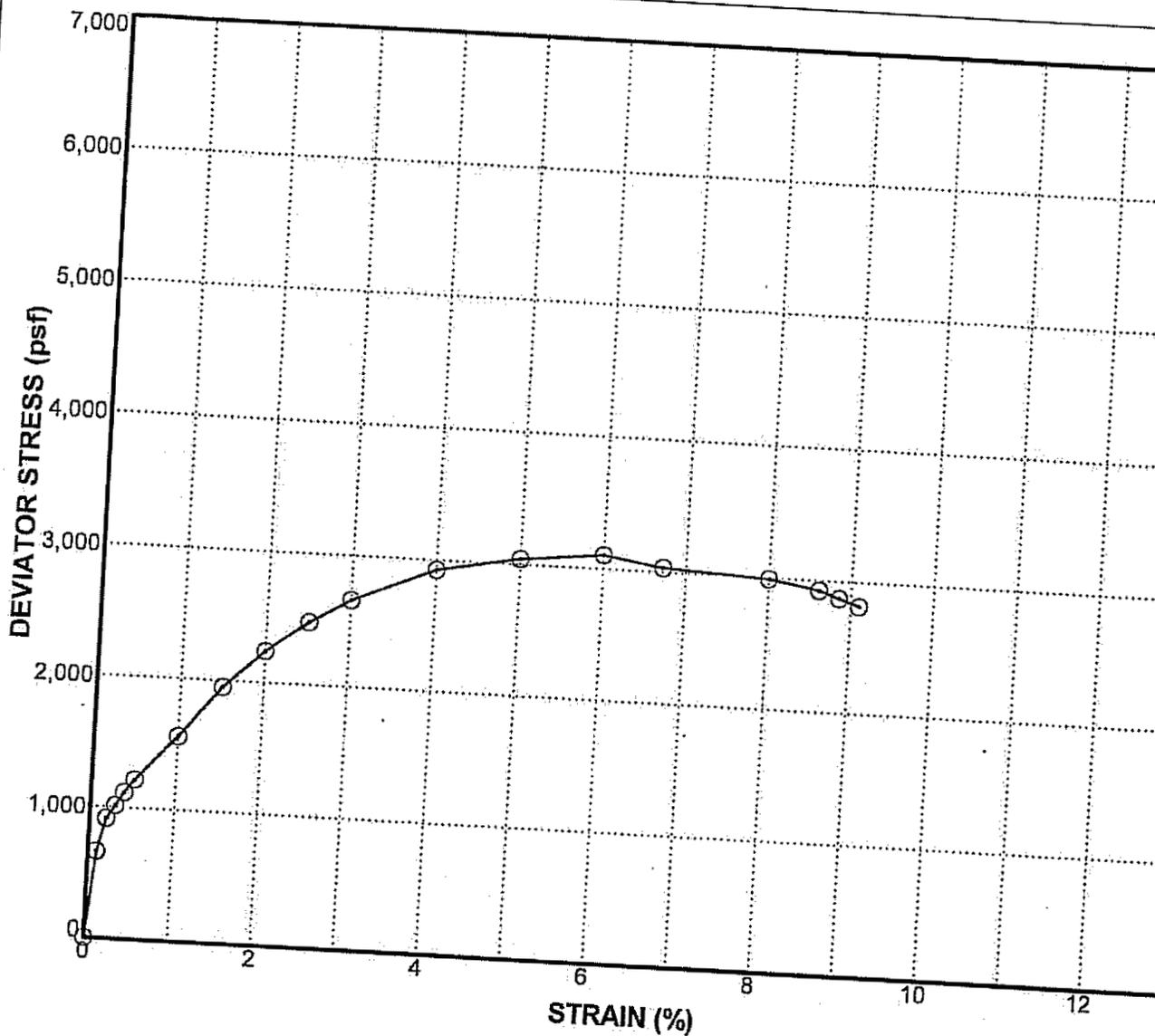
UC = Unconfined Compression
 TX/UU = Unconsolidated Undrained Triaxial



PROJECT NUMBER 92859 DATE 6/30/2008

STRENGTH TEST DATA
 Highway 36 PM 29.17
 01-HUM-36-29.17
 Humboldt County, CA

PLATE
B-5



Sample Source	Classification	Type of Test	Confinement Pressure (psf)	Shear Strength (psf)	Strain (%)	Dry Density (pcf)	Moisture Content (%)
⊙ R-08-005 @ 3'-0"	ARGILLITE	TXCU	2002	1552	6	129	11.0

UC = Unconfined Compression
 TX/UU = Unconsolidated Undrained Triaxial



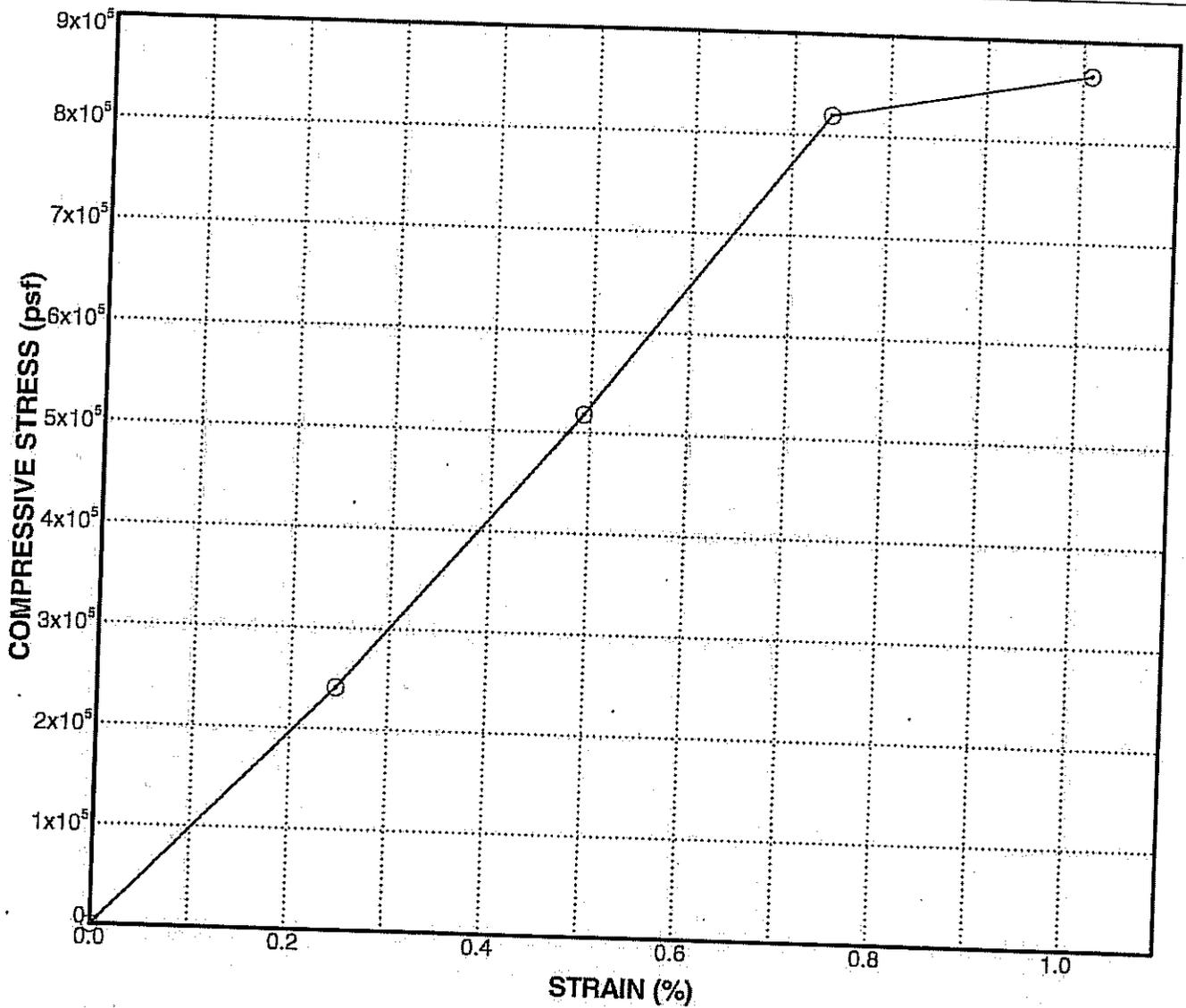
STRENGTH TEST DATA

Highway 36 PM 29.17
 01-HUM-36-29.17
 Humboldt County, CA

PLATE
B-6

PROJECT NUMBER EA# 01-475601 DATE 6/30/2008

U:\NEW GINT PROJECTS\2859 CALTRANS TO# 58916101-HUM-36-29.17\01-HUM-36-29.17 LAB TESTS.GPJ
 KLEINFELDER SANTA ROSA 5-8-08 .GDT -6/30/08 16:12



Sample Source	Classification	Type of Test	Confinement Pressure (psi)	Shear Strength (psf)	Strain (%)	Dry Density (pcf)	Moisture Content (%)
⊙ R-08-002 @ 27.0'	META-SANDSTONE	UC	0	432945	1	168	0.2

UC = Unconfined Compression
 TXUU = Unconsolidated Undrained Triaxial

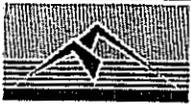
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PROJECT NUMBER EA # 01-475601 DATE 7/9/2008

STRENGTH TEST DATA
 Highway 36 PM 29.17
 01-HUM-36-29.17
 Humboldt County, CA

PLATE
B-7



AP Engineering & Testing, Inc.

CORROSION TEST RESULTS

Client Name: Kleinfelder
Project Name: Highway 36 PM 29.17
Project No.: EA#01-475601

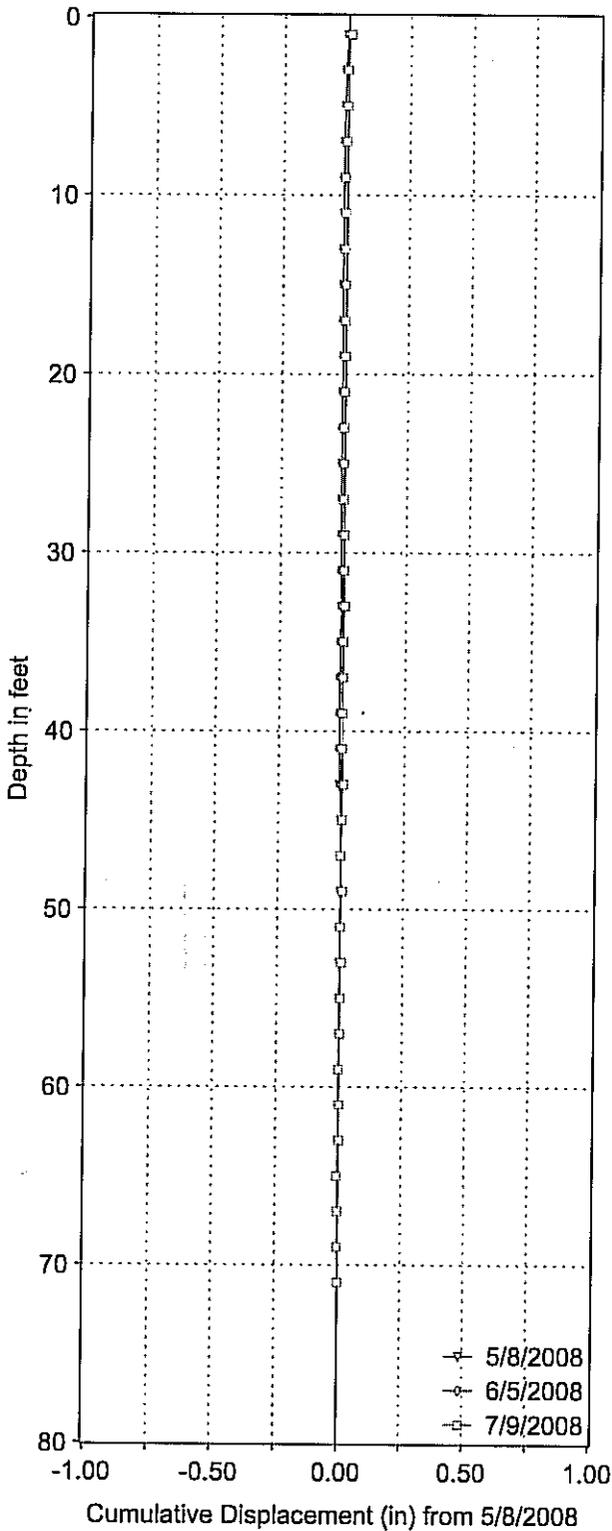
AP Job No.: 28-0561
Date: 05/24/08

Sample ID.	Boring No.	Depth (ft)	Soil Type	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
R-08-002	Core-4.5	4.5	ML	4100	7.2	9	64
R-08-002	Core-9	9	CL	2100	7.5	82	75
R-08-002	Core-25.5	25.5	CL	1400	9.2	35	80

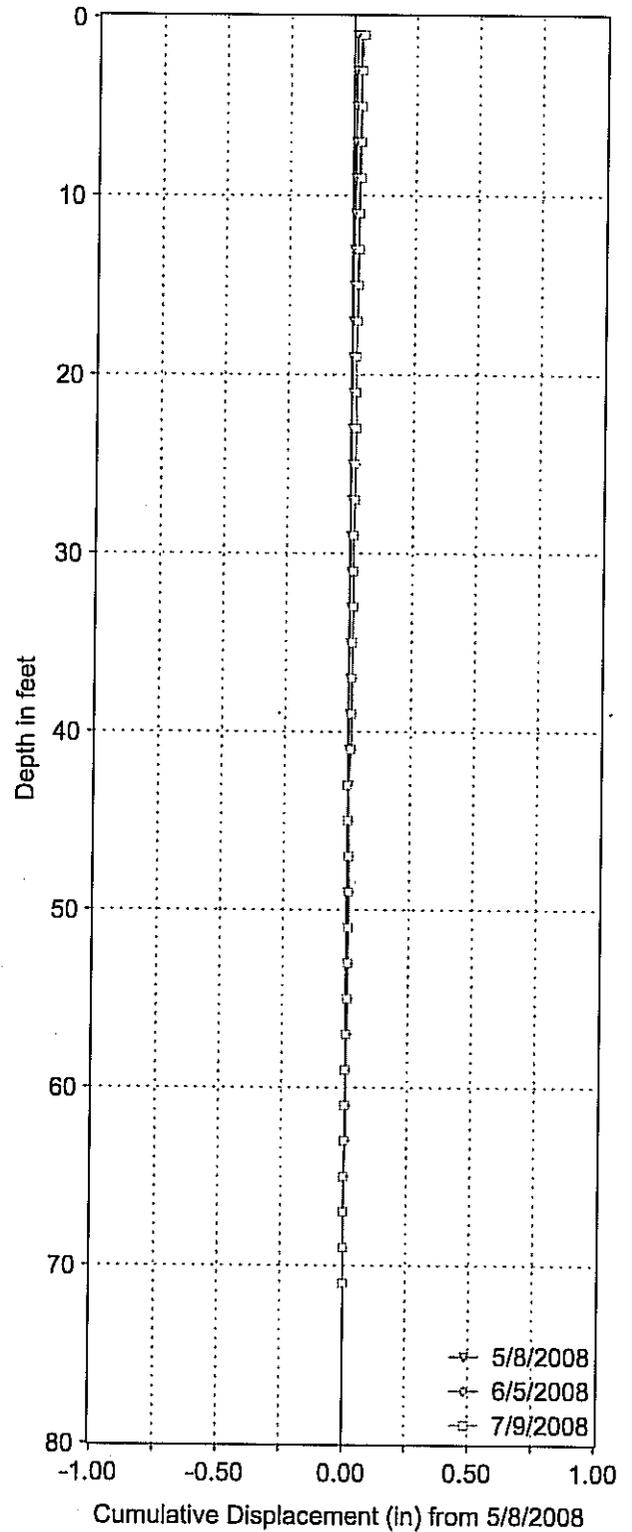
NOTES: Resistivity Test and pH: California Test Methods 532 and 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

APPENDIX C

Ridge 8_002, A-Axis



Ridge 8_002, B-Axis

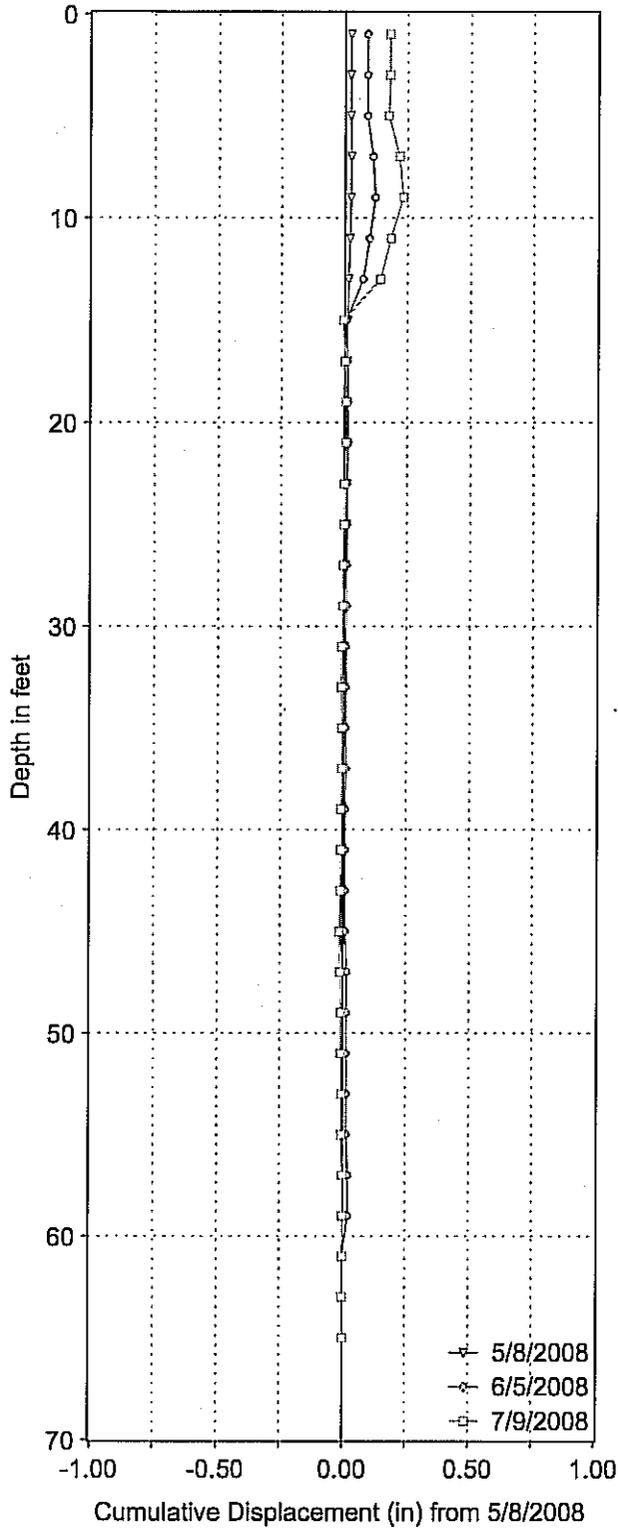


INCLINOMETER MONITORING RESULTS

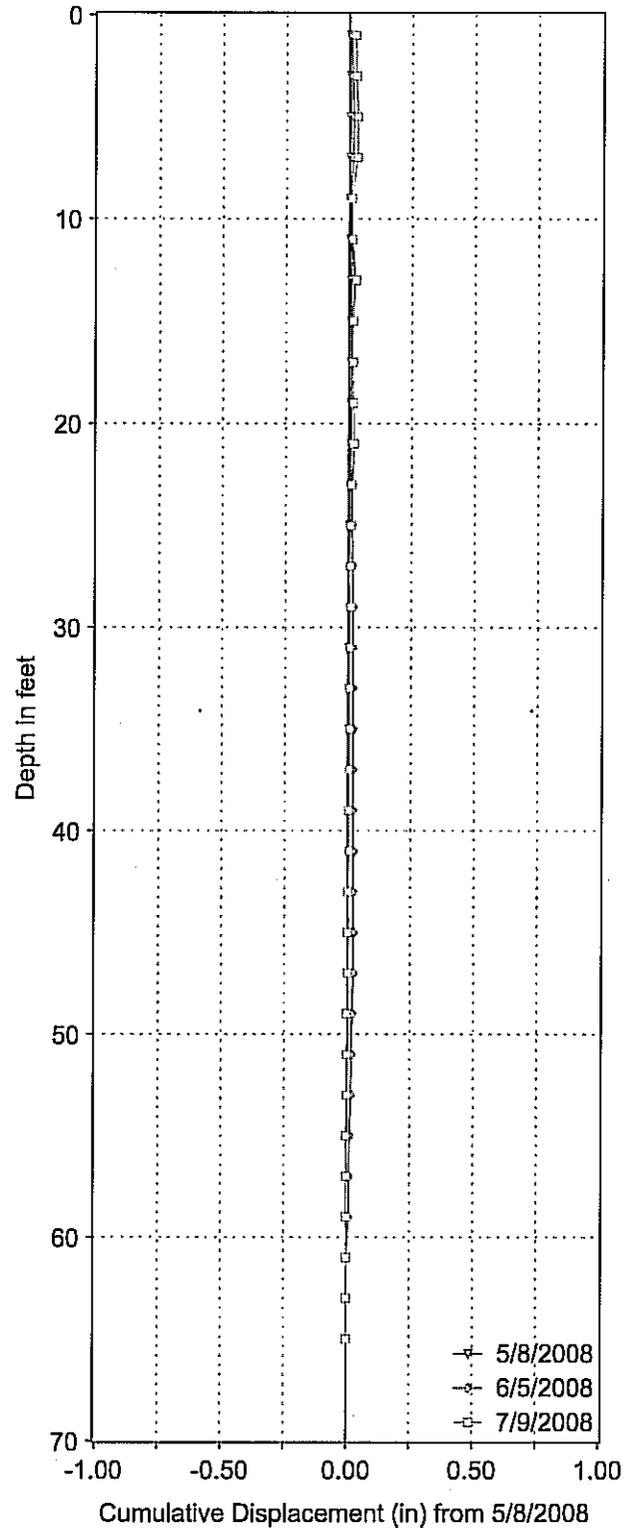
01-HUM-36-PM 29.17
 Ridgetop
 E.A. No.: 01-475601

Depth of Incliner Caseing: 71 feet
 Ao Direction: N/A° (Magnetic North)
 Location (WGS-84) : N/A

Ridge 8_004, A-Axis



Ridge 8_004, B-Axis



INCLINOMETER MONITORING RESULTS

01-HUM-36-PM 29.17
 Ridgetop
 E.A. No.: 01-475601

Depth of Inclinerometer Casing: 65 feet
 Ao Direction: N/A° (Magnetic North)
 Location (WGS-84) : N/A

FOUNDATION REVIEW

DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES

- To: Structure Design
1. Preliminary Report
 2. R.E. Pending File
 3. Specifications & Estimates
 4. File
- Geotechnical Services
1. GS (Sacramento)
 2. GS

Date: 4/2/09

Ridgetop Wall
Structure Name

01-Hum-35-29.17
District - County Route Post Km

District Project Development
District Project Engineer

01-475601 04-E-004
E.A. Number Structure Number

Foundation Report By: Klanfuder - C. Newbold Dated: 8/13/08

Reviewed By: R.G. Jones (OSD) R Price (GS)

General Plan Dated: 1/26/09 Foundation Plan Dated: 1/24/09

No changes. The following changes are necessary.

FOUNDATION CHECKLIST

- | | | |
|---|---|--|
| <input checked="" type="checkbox"/> Pile Types and Design Loads | <input checked="" type="checkbox"/> Footing Elevations, Design Loads, and Locations | <input checked="" type="checkbox"/> LOTB's |
| <input checked="" type="checkbox"/> Pile Lengths | <input checked="" type="checkbox"/> Seismic Data | <input checked="" type="checkbox"/> Fill Surcharge |
| <input checked="" type="checkbox"/> Predrilling | <input checked="" type="checkbox"/> Location of Adjacent Structures and Utilities | <input checked="" type="checkbox"/> Approach Paving Slabs |
| <input checked="" type="checkbox"/> Pile Load Test | <input checked="" type="checkbox"/> Stability of Cuts or Fills | <input checked="" type="checkbox"/> Scour |
| <input checked="" type="checkbox"/> Substitution of H Piles For | <input checked="" type="checkbox"/> Fill Time Delay | <input checked="" type="checkbox"/> Ground Water |
| <input checked="" type="checkbox"/> Concrete Piles <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> Effect of Fills on Abutments and Bents | <input checked="" type="checkbox"/> Tremie Seals/Type D Excavation |

R.G. Jones
Office of Structure Design
Rev. 10/02

1
Branch No.

R Price
Geotechnical Services

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

2211 Park Towne Circle, Suite 2
Sacramento, California 95825



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

April 14, 2009

Department of Transportation
2800 Gateway Oaks Drive, MS 19
Sacramento, California 95833

Attention: Jack Cowell, PE

Subject: Underground Classification No. C240-023-09T
Route 36 Improvements-Humboldt County

Mr. Cowell:

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 true and correct copies of these Classifications 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 Prejob Conferences with the Division prior to commencing any activity associated with construction or rehabilitation of the tunnels.

Please be informed that whenever an employee enters any bore or shaft being constructed under 30 inches in diameter, the Mining and Tunneling Unit then has immediate jurisdiction over that job. Please contact the Mining and Tunneling Unit prior to entering such spaces.

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

Sincerely,

A handwritten signature in black ink that reads "John R. Leahy".

John R. Leahy
Senior Engineer

cc: Jerry Snapp
File



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C240-023-09T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2800 Gateway Oaks Drive, Sacramento, California 95833
(MAILING ADDRESS)

at ROUTE 36 IMPROVEMENTS – HUNBOLDT COUNTY
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 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.

The twenty-six 30-inch diameter by 35 feet deep drilled shafts located along Route 36, approximately 500 feet west of the intersection of Route 36 and Deerfield Ranch Road, Bridgeville, Humboldt County.

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

Date April 14, 2009

John R Leahy
(SENIOR ENGINEER)
John R. Leahy