

**FOR CONTRACT NO.: 01-475014**

**Project ID: 0100000333**

# **INFORMATION HANDOUT**

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

**CALIFORNIA REGIONAL WATER QUALITY  
CONTROL BOARD (401) CERTIFICATION  
(WDID No. 1B11038WNHU) and WATER QUALITY  
ORDER No. 2003-0017-DWQ**

**STATE OF CALIFORNIA  
DEPARTMENT OF FISH AND GAME  
1601 STREAMBED ALTERATION AGREEMENT  
(NOTIFICATION NO. 1600-2011-0080-R1)**

**FOUNDATION REPORT**

**PRELIMINARY FOUNDATION REPORT**

**TUNNEL CLASSIFICATION**

**ROUTE: 01-HUM-254-PM 5.9**



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.”

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(Transferee)

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(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](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 NWP, 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 Regional Water Quality Control Board

## North Coast Region

Geoffrey M. Hales, Chairman



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Edmund G. Brown Jr.  
Governor

May 25, 2011

In the Matter of

### Water Quality Certification

for the

**California Department of Transportation  
Highway 254 – Myers Flat Wall Roadway Stabilization Project  
WDID No. 1B11038WNHU**

APPLICANT:	California Department of Transportation
RECEIVING WATER:	Unnamed tributaries to the Eel River
HYDROLOGIC AREA:	Eel River Hydrologic Unit No. 111.00
COUNTY:	Humboldt
FILE NAME:	CDOT - HWY 254, Myers Flat Wall Roadway Stabilization

#### BY THE EXECUTIVE OFFICER:

1. On April 1, 2011, 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 proposed Highway 254, Myers Flat Wall Roadway Stabilization Project (project). The proposed project will cause disturbances to waters of the United States (U.S.) and waters of the State associated with an ephemeral drainage within the Eel River Hydrologic Unit (HU), No.111.00 (Weott Hydrologic Sub-Area 111.31). The Regional Water Board provided public notice of the application pursuant to title 23, California Code of Regulations, section 3858 on May 3, 2011, and posted information describing the project on the Regional Water Board's website. No comments were received.
2. The proposed project is located in Humboldt County, on Highway 254 (HUM-254), south of the town of Miranda at post mile (PM) 5.9. The purpose of the proposed project is to restore the highway to its pre-damage condition under the Major Damage (Permanent Restoration) Program. The project includes improving drainage facilities, reconstructing 360 feet of roadway, and constructing a 226-foot

long tieback wall on the west side of Highway 254. The project will also include the placement of metal beam guard railing and re-striping 520 feet of highway.

3. Caltrans has determined that total project permanent impacts to waters of the U.S. and State will be approximately 12 feet<sup>2</sup> (4 linear feet). The temporary project impacts to waters of the U.S. and State will be approximately 112 feet<sup>2</sup> (40.3 linear feet). The total disturbed soil area (DSA) for this project is estimated at 0.28 acres. The DSA is based on the footprint of the areas needed to reconstruct the roadway and install the wall and drainage system including access and staging areas. Since the impacts associated with the project are minor, no compensatory mitigation is required for this project. However, as part of the proposed project Caltrans will revegetate the disturbed area with appropriate native vegetation.
4. Caltrans' contractor will be required to implement Best Management Practices (BMPs) for construction and post construction phases of the project. Caltrans will utilize BMPs to provide erosion and sediment control and pollution prevention throughout the project area during construction. All graded areas within the project affected by the construction activities will be appropriately stabilized and BMPs will be implemented to ensure erosion is minimized and controlled.
5. The project is tentatively scheduled for the period from March 1, 2011 to October 28, 2012; however, work within the drainages will only be conducted in the dry season (May 15<sup>th</sup> to October 15<sup>th</sup>). Caltrans has applied for authorization from the United States Army Corps of Engineers to perform the project under their Nationwide Permits No. 14 Non-Reporting (linear transportation projects) pursuant to Clean Water Act, section 404. In addition, Caltrans has applied for a 1602 Lake and Streambed Alteration Agreement from the California Department of Fish and Game. Caltrans has determined that this project is Categorical Exempt from California Environmental Quality Act (CEQA, class 1 categorical exemption). In addition, Regional Water Board staff also determined that this project is categorically exempt from CEQA and anticipates filing a notice of exemption.
6. The South Fork Eel River watershed is listed on the Clean Water Act Section 303(d) list as impaired for sediment and temperature. On December 16, 1999, the U.S. EPA established sediment Total Maximum Daily Loads (TMDLs) for the South Fork Eel River Watershed. Roads are a significant source of sediment in the watershed (directly, from surface erosion, and, indirectly, by triggering landslides). In addition, activities that impact the riparian zone and reduce riparian vegetation are identified as sources contributing to increased stream temperatures. A focus on measures to reduce sediment discharges to surface waters from roads in the watershed, and measures to avoid, minimize, and mitigate impacts on riparian zones is essential for achieving TMDL compliance.

7. Pursuant to Regional Water Board Resolution R1-2004-0087, *Total Maximum Daily Load Implementation Policy Statement for Sediment-Impaired Receiving Waters within the North Coast Region* (Sediment TMDL Implementation Policy), the Executive Officer is directed to “rely on the use of all available authorities, including existing regulatory standards, and permitting and enforcement tools to more effectively and efficaciously pursue compliance with sediment-related standards by all dischargers of sediment waste.”
8. To ensure compliance with sediment, temperature and other related Water Quality Objectives within the Basin Plan, and consistent with the U.S. EPA- and Regional Water Board established TMDLs, adequate wetland and riparian protection and stringent requirements to avoid, minimize, and mitigate the impacts associated with the proposed project will be incorporated as enforceable conditions this Water Quality Certification. In addition, Caltrans will be required to conduct surface water monitoring, sampling, and analysis in accordance with the conditions of the Water Quality Certification. Additionally, storm water runoff monitoring, sampling, and analysis will be conducted as required by the State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from the State of California, Department of Transportation (Caltrans) Properties, Facilities and Activities Order No. 99 – 06 - DWQ. The surface water data collected will be utilized to assess the adequacy of BMPs during construction as well as site specific mitigation measures proposed to minimize impacts to the environment, including sediment and temperature impacts. Accordingly, this Water Quality Certification is consistent with, and implements the South Fork River TMDLs.
9. The federal antidegradation policy requires that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California’s antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board’s Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. This Order is consistent with applicable federal and State antidegradation policies, as it does not authorize the discharge of increased concentrations of pollutants or increased volumes of treated wastewater, and does not otherwise authorize degradation of the waters affected by this project.
10. The South Fork Eel River from the middle of Section 29, T23N, R16W (approximately one-half mile upstream of Rattlesnake Creek confluence) to the confluence with the Eel River is designated as a recreational reach under both federal and California Wild and Scenic Rivers Acts. These acts require

preservation of the river's free-flowing condition; anadromous and resident fisheries; and outstanding geologic, wildlife, flora and fauna, historic and cultural, visual, recreational, and water quality values. Recreational segments are generally developed, with parallel roads, bridges, and structures. All activities normally associated with public lands are permitted subject to the protection of free flowing conditions and outstanding values. Implementation of the Project would not affect the free-flowing condition of the South Fork Eel River and would not affect the extraordinary values for which the segment was listed.

Receiving Waters: Unnamed Tributaries to the Eel River  
Eel River Hydrologic Unit No. 111.00,  
Weott Hydrologic Sub-Area No. 111.31.

Filled or Excavated Areas: Temporary – streams (Waters of U.S.): 112 feet<sup>2</sup>  
Permanent - streams (Waters of U.S.): 12 feet<sup>2</sup>

Total Linear Impacts: Temporary - streams (Waters of U.S.): 40.3 linear ft  
Permanent - streams (Waters of U.S.): 4 linear ft

Dredge Volume : None

Latitude/Longitude: 40.2289 N / 123.8239 W

ACCORDINGLY, BASED ON ITS INDEPENDENT REVIEW OF THE RECORD, THE REGIONAL WATER BOARD CERTIFIES THAT THE CALTRANS HIGHWAY 254 MYERS FLAT WALL ROADWAY STABLIZATION PROJECT (FACILITY NO. 1B10038WNME), 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 the Caltrans complies with the following terms and conditions:

**All conditions of this order apply to Caltrans (and all its employees) and all contractors (and their employees), sub-contractors (and their employees), and any other entity or agency that performs activities or work on the project (including the off-site mitigation lands) as related to this Water Quality Certification.**

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 this certification is conditioned upon total payment of any fee required under title 23, California Code of Regulations, section 3833, and owed by the applicant.
4. Except as may be modified by any preceding conditions, all certification actions are contingent on: a) the discharge being limited, and all proposed revegetation, avoidance, minimization, and mitigation measures being completed, in strict compliance with the applicant's project description and CEQA documentation, as approved herein, and b) compliance with all applicable water quality requirements and water quality control plans including the requirements of the Basin Plan, and amendments thereto.
5. 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.
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 as detailed in the Basin Plan.
7. Any change in the design or 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, consideration, and written concurrence.
8. Caltrans shall provide a copy of this Order and State Water Resources Control Board (SWRCB) Order No. 2003-0017-DWQ to the contractor, all subcontractors, and all utility companies 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, subcontractors, or utility companies.
9. 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 channel, vegetation or ground disturbing activities, dewatering activities, major concrete pours, or water diversion activities with details regarding the construction schedule, in order to allow Regional Water Board staff to be present on-site during installation and removal activities, and to answer any public inquiries that may

arise regarding the project. Caltrans shall provide Regional Water Board staff access to the project site to document compliance with this order.

10. The Resident Engineer (or appropriately authorized agent) 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, before forecasted storm events, and when a new contractor or subcontractor arrives to begin work at the site. The contractors, subcontractors and their employees, as well as any inspectors or monitors assigned to the project, shall be present at the meetings. Caltrans shall maintain dated sign-in sheets for attendees at these meetings, and shall make them available to the Regional Water Board on request.
11. All activities and best management practices (BMPs) shall be implemented according to the submitted application and the conditions in this certification. BMPs for erosion, sediment, turbidity and pollutant control shall be implemented and in place at commencement of, during, and after any ground clearing activities, construction activities, or any other project activities that could result in erosion, sediment, or other pollutant discharges to waters of the State. The BMPs shall be implemented in accordance with the Caltrans Construction Site Best Management Practice Manual (CCSBMPM) and all contractors and subcontractors shall comply with the CCSBMPM. In addition, BMPs for erosion and sediment control shall be utilized year round, regardless of season or time of year. Caltrans shall stage erosion and sediment control materials at the work site. All BMPs shall be installed properly and in accordance with the manufacturer's specifications. If the project Resident Engineer elects to install alternative BMPs for use on the project, Caltrans shall submit a proposal to Regional Water Board staff for review and concurrence.
12. Caltrans shall prioritize the use of wildlife-friendly biodegradable (not photo-degradable) erosion control products wherever feasible. Caltrans shall not use or allow the use of erosion control products that contain synthetic netting for permanent erosion control (i.e. erosion control materials to be left in place for two years or after the completion date of the project). If Caltrans finds that erosion control netting or products have entrapped or harmed wildlife, personnel shall remove the netting or product and replace it with wildlife-friendly biodegradable products. Caltrans shall not use or allow the use of erosion control products that contain synthetic materials within waters of the United States or waters of the State at any time. Caltrans shall request approval from the Regional Water Board if an exception from this requirement is needed for a specific location.

13. 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 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.
14. Caltrans is prohibited from discharging waste to waters of the State, unless explicitly authorized by this Order. For example, 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 waters of the State. In addition, none of the materials listed above shall be placed within 150 linear feet of waters of the State or where the materials may be washed by rainfall into waters of the State.
15. 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.
16. Caltrans and their contractor are not authorized to discharge wastewater (e.g., water that has contacted uncured concrete or cement, or asphalt) to surface waters, ground waters, or land. Wastewater may only be disposed of to a sanitary waste water collection system/facility (with authorization from the facility's owner or operator) or a properly-licensed disposal or reuse facility. If Caltrans or their contractor proposes an alternate disposal method, Caltrans or their contractor shall apply for a permit from the Regional Water Board. Plans to reuse or recycle wastewater require written approval from Regional Water Board staff.
17. Caltrans shall submit, subject to approval by the Regional Water Board staff, a dewatering and/or diversion plan that appropriately describe the dewatered or diverted areas and how those areas will be handled during construction. The diversion/dewatering plans shall be submitted no later than 30 days prior to conducting the proposed activity. Information submitted shall include the area or work to be diverted or dewatered and method of the proposed activity. All diversion or dewatering activities shall be designed to minimize the impact to waters of the State and maintain natural flows upstream and downstream. All dewatering or diversion structures shall be installed in a manner that does not cause sedimentation, siltation or erosion upstream or downstream. All dewatering

or diversion structures shall be removed immediately upon completion of project activities. The in-channel work will only be conducted between May 15<sup>th</sup> and October 15<sup>th</sup>. This Water Quality Certification does not authorize Caltrans to draft surface waters.

18. Fueling, lubrication, maintenance, storage and staging of vehicles and equipment shall be outside of waters of the U.S. 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 U.S. At no time shall Caltrans use any vehicle or equipment which leaks any substance that may impact water quality.
19. Caltrans shall provide analysis and verification that placing non-hazardous waste or inert materials (which may include discarded product or recycled materials) will not result in degradation of water quality, human health, or the environment. All project-generated waste shall be handled, transported, and disposed in strict compliance with all applicable State and Federal laws and regulations. When 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. In accordance with State and Federal laws and regulations, Caltrans is liable and responsible for the proper disposal of waste generated by their project.
20. Surface water monitoring shall be conducted whenever a project activity is conducted within waters of the State (e.g. demolition, pier construction, stream diversions). Surface water monitoring shall be conducted when any project activity has, or has the potential to, mobilize sediment and/or alter background conditions within waters of the State. In order to demonstrate compliance with receiving water limitations and applicable water quality standards, field measurements shall be collected whenever a project activity may alter background conditions.
21. Caltrans shall establish effluent, upstream (background) and downstream monitoring locations to demonstrate compliance with all applicable water quality objectives as detailed in the Basin Plan. 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 work is being conducted within waters of the State.

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

pH	<6.5 or >8.5 (any changes >0.5 units)
temperature	>0.5°F above background
dissolved oxygen	<7 milligrams per liter (mg/L)
turbidity	20% above natural background
total dissolved solids	>120 mg/L
specific conductance	>200 micromhos @ 77°F

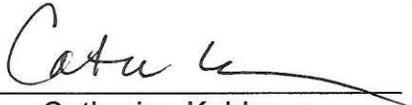
If any measurements are beyond the water quality objectives 50 feet downstream of the source(s), all necessary steps shall be taken to install, repair, and/or modify BMPs to control the source(s). In addition, the overall distance from the source(s) to the downstream extent of the exceedance shall be measured.

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 detailed above (turbidity only if it is higher than 20 NTU as well). Upstream and downstream pictures 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 15<sup>th</sup> of the following month.

23. Rainy Day Reports: 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. A brief report containing these photos shall be submitted within 30 days of the rainfall event that generated runoff from the disturbed areas. Once the site has demonstrated appropriate and effective erosion and sediment control, Caltrans may request a reprieve from this condition from the Regional Water Board.

24. Caltrans proposes to reduce the project impacts by implementing on-site revegetation activities. The on-site restoration will be conducted in accordance with Caltrans-prepared *Myers Flat Revegetation Plan*, dated September, 2010. Monitoring reports for the revegetation project shall be submitted to the Regional Water Board on December 31, yearly for five years after completion of the project.
25. 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.
26. The Regional Water Board may add to or modify the conditions of this Order, as appropriate, and 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.
27. This Order is not transferable. In the event of any change in control of ownership of land presently owned or controlled by Caltrans, Caltrans 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.

28. The authorization of this certification for any dredge and fill activities expires on March 25, 2016. 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.
29. Please contact our staff Environmental Specialist / Caltrans Liaison Jeremiah Puget of at (707) 576-2835 or [jpuget@waterboards.ca.gov](mailto:jpuget@waterboards.ca.gov) if you have any questions.



Catherine Kuhlman  
Executive Officer

110525\_JJP\_CDOT\_Hwy254\_MyersFlatWall\_401cert

**Weblink:** 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](http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0017.pdf)

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

**Copies sent to:** Ms. Carol Wilson, CDOT – Eureka, P.O. Box 3700,  
Eureka, CA 95501-3700

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

## STATE WATER RESOURCES CONTROL BOARD

### WATER QUALITY ORDER NO. 2003 - 0017 - DWQ

#### STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR DREDGED OR FILL DISCHARGES THAT HAVE RECEIVED STATE WATER QUALITY CERTIFICATION (GENERAL WDRs)

The State Water Resources Control Board (SWRCB) finds that:

1. Discharges eligible for coverage under these General WDRs are discharges of dredged or fill material that have received State Water Quality Certification (Certification) pursuant to federal Clean Water Act (CWA) section 401.
2. Discharges of dredged or fill material are commonly associated with port development, stream channelization, utility crossing land development, transportation water resource, and flood control projects. Other activities, such as land clearing, may also involve discharges of dredged or fill materials (e.g., soil) into waters of the United States.
3. CWA section 404 establishes a permit program under which the U.S. Army Corps of Engineers (ACOE) regulates the discharge of dredged or fill material into waters of the United States.
4. CWA section 401 requires every applicant for a federal permit or license for an activity that may result in a discharge of pollutants to a water of the United States (including permits under section 404) to obtain Certification that the proposed activity will comply with State water quality standards. In California, Certifications are issued by the Regional Water Quality Control Boards (RWQCB) or for multi-Region discharges, the SWRCB, in accordance with the requirements of California Code of Regulations (CCR) section 3830 et seq. The SWRCB's water quality regulations do not authorize the SWRCB or RWQCBs to waive certification, and therefore, these General WDRs do not apply to any discharge authorized by federal license or permit that was issued based on a determination by the issuing agency that certification has been waived. Certifications are issued by the RWQCB or SWRCB before the ACOE may issue CWA section 404 permits. Any conditions set forth in a Certification become conditions of the federal permit or license if and when it is ultimately issued.
5. Article 4, of Chapter 4 of Division 7 of the California Water Code (CWC), commencing with section 13260(a), requires that any person discharging or proposing to discharge waste, other than to a community sewer system, that could affect the quality of the waters of the State,<sup>1</sup> file a report of waste discharge (ROWD). Pursuant to Article 4, the RWQCBs are required to prescribe waste discharge requirements (WDRs) for any proposed or existing discharge unless WDRs are waived pursuant to CWC section 13269. These General WDRs fulfill the requirements of Article 4 for proposed dredge or fill discharges to waters of the United States that are regulated under the State's CWA section 401 authority.

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<sup>1</sup> "Waters of the State" as defined in CWC Section 13050(e)

6. These General WDRs require compliance with all conditions of Certification orders to ensure that water quality standards are met.
7. The U.S. Supreme Court decision of *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) (the SWANCC decision) called into question the extent to which certain “isolated” waters are subject to federal jurisdiction. The SWRCB believes that a Certification is a valid and enforceable order of the SWRCB or RWQCBs irrespective of whether the water body in question is subsequently determined not to be federally jurisdictional. Nonetheless, it is the intent of the SWRCB that all Certification conditions be incorporated into these General WDRs and enforceable hereunder even if the federal permit is subsequently deemed invalid because the water is not deemed subject to federal jurisdiction.
8. The beneficial uses for the waters of the State include, but are not limited to, domestic and municipal supply, agricultural and industrial supply, power generation, recreation, aesthetic enjoyment, navigation, and preservation and enhancement of fish, wildlife, and other aquatic resources.
9. Projects covered by these General WDRs shall be assessed a fee pursuant to Title 23, CCR section 3833.
10. These General WDRs are exempt from the California Environmental Quality Act (CEQA) because (a) they are not a “project” within the meaning of CEQA, since a “project” results in a direct or indirect physical change in the environment (Title 14, CCR section 15378); and (b) the term “project” does not mean each separate governmental approval (Title 14, CCR section 15378(c)). These WDRs do not authorize any specific project. They recognize that dredge and fill discharges that need a federal license or permit must be regulated under CWA section 401 Certification, pursuant to CWA section 401 and Title 23, CCR section 3855, et seq. Certification and issuance of waste discharge requirements are overlapping regulatory processes, which are both administered by the SWRCB and RWQCBs. Each project subject to Certification requires independent compliance with CEQA and is regulated through the Certification process in the context of its specific characteristics. Any effects on the environment will therefore be as a result of the certification process, not from these General WDRs. (Title 14, CCR section 15061(b)(3)).
11. Potential dischargers and other known interested parties have been notified of the intent to adopt these General WDRs by public hearing notice.
12. All comments pertaining to the proposed discharges have been heard and considered at the November 4, 2003 SWRCB Workshop Session.
13. The RWQCBs retain discretion to impose individual or General WDRs or waivers of WDRs in lieu of these General WDRs whenever they deem it appropriate. Furthermore, these General WDRs are not intended to supersede any existing WDRs or waivers of WDRs issued by a RWQCB.

IT IS HEREBY ORDERED that WDRs are issued to all persons proposing to discharge dredged or fill material to waters of the United States where such discharge is also subject to the water quality certification requirements of CWA section 401 of the federal Clean Water Act (Title 33 United States Code section 1341), and such certification has been issued by the applicable RWQCB or the SWRCB, unless the applicable RWQCB notifies the applicant that its discharge will be regulated through WDRs or waivers of WDRs issued by the RWQCB. In order to meet the provisions contained in Division 7 of CWC and regulations adopted thereunder, dischargers shall comply with the following:

1. Dischargers shall implement all the terms and conditions of the applicable CWA section 401 Certification issued for the discharge. This provision shall apply irrespective of whether the federal license or permit for which the Certification was obtained is subsequently deemed invalid because the water body subject to the discharge has been deemed outside of federal jurisdiction.
2. Dischargers are prohibited from discharging dredged or fill material to waters of the United States without first obtaining Certification from the applicable RWQCB or SWRCB.

#### CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on November 19, 2003.

AYE: Arthur G. Baggett, Jr.  
Peter S. Silva  
Richard Katz  
Gary M. Carlton  
Nancy H. Sutley

NO: None.

ABSENT: None.

ABSTAIN: None.

  
Debbie Irvin  
Clerk to the Board

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

**RECEIVED**

JUN 06 2011



**D. F. G. – EUREKA**

**STREAMBED ALTERATION AGREEMENT**  
NOTIFICATION No. 1600-2011-0080-R1  
UNNAMED TRIBUTARY TO SOUTH FORK EEL RIVER

CALIFORNIA DEPARTMENT OF TRANSPORTATION AND FRANK DEMLING  
MYERS FLAT WALL ROADWAY STABILIZATION  
(ONE ENCROACHMENT)

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and 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 April 5, 2011, that Permittee intends to complete the project described herein.

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

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

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

## **PROJECT LOCATION**

The project is located at an Unnamed Tributary to South Fork Eel River, in the County of Humboldt, State of California; Latitude 40.2289°N, Longitude 123.8239°W; Section 3, Township 3S, Range 3E, U.S. Geological Survey (USGS) map Miranda, Humboldt Base and Meridian.

## **PROJECT DESCRIPTION**

The project is limited to the replacement of one existing 24-inch diameter culvert with a new 36-inch diameter, 58-foot-long culvert on State Highway 254 at post mile 5.9.

## **PROJECT IMPACTS**

Existing fish or wildlife resources the project could substantially adversely affect include: Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), steelhead trout (*O.*

*mykiss*), Pacific lamprey (*Lampetra tridentate*), foothill yellow legged frog (*Rana boylei*), other non-game and game fishes, amphibians, reptiles, aquatic invertebrates, mammals, birds, and other aquatic and riparian species.

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

**Impacts to bed, channel, or bank and effects on habitat structure:**

1. permanent loss of natural bed or bank;
2. temporary relocation of stream channel;
3. permanent change in gradient of streambed;
4. temporary loss of bank stability during construction;
5. soil compaction or other disturbance to soil layer;
6. increase in sediment transport;

**Impacts to water quality:**

1. temporary increased turbidity;

**Impacts to bed, channel, or bank and direct effects on fish, wildlife, and their habitat:**

1. temporary disturbance from project activity;

**Impacts to natural flow and effects on habitat structure and process:**

1. temporary diversion of flowing water from, or around, activity site;
2. dewatering;
3. rewatering;

**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 DFG Notification of Work Initiation and Completion. The Permittee shall contact DFG within the 7-day period preceding the beginning of work permitted by this Agreement. Information to be disclosed shall include Agreement number, and the anticipated start date. The Permittee shall contact DFG within thirty days of completion of the work permitted by this Agreement. Information to be disclosed shall include Agreement number.

## **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 Except where otherwise stipulated in this Agreement, all work shall be in accordance with the work plan submitted with Notification No. 1600-2011-0080-R1, as of April 5, 2011.
- 2.2 All work shall be confined to the period June 15 through October 31 of each year.
- 2.3 Permanent culverts shall extend lengthwise completely beyond the toe of fill. Permanent culverts and their outfall structures shall be aligned with the stream channel, as wide as or wider than the channel width, and shall be placed with the bottom set at or slightly below the natural streambed elevation to the maximum extent feasible. If permanent culverts cannot be set to grade, they shall have downspouts and/or energy dissipators below the outfall as needed to effectively control erosion. If half-round downspouts (flumes) are used, they shall be placed in line with the culvert, sized larger than the culvert and of sufficient size to accommodate entire anticipated stream flow. Downspouts shall be securely attached to the culvert and staked or otherwise anchored to the fill slope.
- 2.4 All fill stockpiled at the site shall be placed in a stable upland location where it cannot erode into Waters of the State. Any proposed fill disposal site shall be reviewed and approved by DFG prior to utilization.
- 2.5 DFG shall be notified immediately in the event of a concrete spill into Waters of the State.
- 2.6 Equipment shall not operate in a live (flowing) stream or wetted channel except as may be necessary to construct and remove in-stream structures to catch and contain water (i.e. cofferdams) to divert stream flow and isolate the work site, or as otherwise specifically provided for in this Agreement.
- 2.7 No fill material shall be placed within a stream except as specified in this Agreement. No native fill shall be placed in a live stream. Any fill material used shall be placed and/or removed in such a manner that it shall cause no sediment discharge or siltation in the stream.

- 2.8 All heavy equipment that will be entering the live stream shall be cleaned of materials deleterious to aquatic life including oil, grease, hydraulic fluid, soil and other debris. Cleaning of equipment shall take place outside of the riparian area and prior to entering the water.
- 2.9 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 jute netting, straw wattles, and geotextiles to protect and stabilize soils. Geotextiles, fiber rolls, and other erosion control treatments shall not contain plastic mesh netting.
- 2.10 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 the 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 straw mulch and 100 lbs/acre equivalent barley seed. No annual, or Italian, ryegrass (*Lolium multiflorum*) shall be used.
- 2.11 Encroachments shall be constructed, deconstructed, and maintained in a manner that minimizes to the extent feasible headcutting or downcutting of the stream channel by installing grade control such as riprap, woody debris, or through other effective measures.
- 2.12 Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations.
- 2.13 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.
- 2.14 Refueling of equipment and vehicles and storing, adding or draining lubricants, coolants or hydraulic fluids shall not take place within riparian areas or within stream beds, banks or channels. All such fluids and containers shall be disposed of properly. Heavy equipment including water drafting trucks parked within riparian areas or streambeds, banks or channels shall use drip pans or other devices (i.e., absorbent blankets, sheet barriers or other materials) as needed to prevent soil and water contamination.
- 2.15 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.
- 2.16 No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete washings, oil or petroleum products, or other organic or earthen material from any logging, construction, 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.

### **3. Reporting Measures**

Permittee shall meet each reporting requirement described below.

- 3.1 Permittee shall provide a final construction report via email to DFG no later than 30 days after the project is fully completed. The construction report at a minimum shall contain a brief summary of the work accomplished, and pre- and post-project photos of each site.

### **CONTACT INFORMATION**

Written communication that Permittee or DFG submits to the other shall be delivered to the address below unless Permittee or DFG specifies otherwise:

To Permittee:

Mr. Frank Demling  
California Department of Transportation  
1656 Union Street  
Eureka, CA 95502-3700  
Fax: (707) 441-5733  
Email: Frank\_Demling@dot.ca.gov

To DFG:

Department of Fish and Game  
Northern Region  
619 2<sup>nd</sup> Street  
Eureka, CA 95501

Attn: Lake and Streambed Alteration Program – Scott Bauer  
Notification #1600-2011-0080-R1  
Fax: (707) 441-2021  
Email: sbauer@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](http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html).

## **TERM**

This Agreement becomes effective on the date of DFG's signature and terminates **2 years** from the effective date, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

## **AUTHORITY**

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and

represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

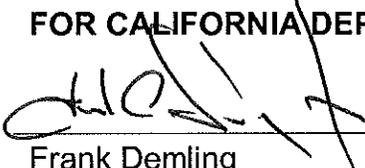
**AUTHORIZATION**

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

**CONCURRENCE**

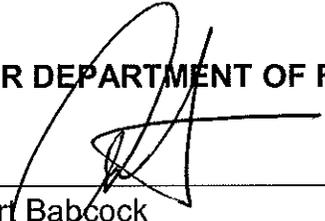
The undersigned accepts and agrees to comply with all provisions contained herein.

**FOR CALIFORNIA DEPT. OF TRANSPORTATION**

  
\_\_\_\_\_  
Frank Demling  
Project Manager

6 JUNE 2011  
\_\_\_\_\_  
Date

**FOR DEPARTMENT OF FISH AND GAME**

  
\_\_\_\_\_  
Curt Babcock  
Environmental Program Manager

T. LABANZA

6/7/11  
\_\_\_\_\_  
Date

Prepared by: Scott Bauer  
Environmental Scientist

## Memorandum

*Flex your power!  
Be energy efficient!*

**To:** GARY BLAKESLEY  
Structure Design Branch 5  
Office of Bridge Design North

**Date:** May 11, 2009

**File:** 01-HUM-254-PM 5.8  
EA: 01-475001

**From:** DEPARTMENT OF TRANSPORTATION  
DIVISION OF ENGINEERING SERVICES  
OFFICE OF GEOTECHNICAL DESIGN - NORTH  
BRANCH B - EUREKA

**Subject:** Foundation Report, Miranda Wall PM 5.8

### Project Description

This Foundation Report has been prepared to summarize the results of the geotechnical investigation and provide foundation recommendations for the proposed soldier pile tieback wall on Route 254 at PM 5.8 in Humboldt County (Plate 1). At this location, District 01 plans to construct a soldier pile tieback wall in order to stabilize the roadway within the limits of a landslide. The proposed soldier pile tieback wall is approximately 230 feet in length with a maximum wall height (to bottom of lagging) of 20 feet. Kleinfelder prepared a preliminary Foundation Report, dated November 29, 2007. Some of the plates contained in Kleinfelder's report are attached. This report, and the recommendations contained herein, supersedes all other geotechnical reports and recommendations relating to this storm damage site.

During the winter of 2005-2006, a landslide occurred on the west (downhill) side of HUM 254, near PM 5.8. The approximate limits of the landslide are shown on the attached Site Plan (Plate 2). A draft layout sheet showing the wall layout line (Layout L-1, dated 4/22/09) is also attached.

### Scope of Work

The foundation recommendations contained in this report are based on geotechnical borings, laboratory testing of soil and rock samples, geotechnical calculations using data obtained from the subsurface investigation and laboratory testing, and Department standards. Subsurface conditions were evaluated only at the boring locations and may deviate elsewhere within the project limits.

### Pertinent Reports and Investigations

The following publications were reviewed to assist in the assessment of site conditions:

1. *California Seismic Hazard Map 1996*, Caltrans, Lalliana Mualchin, 1996.
2. *Geology and Geomorphic Features Related to Landsliding, Miranda 7.5 Minute Quadrangle, Humboldt County, California*, compiled by T.E. Spittler, California Department of Conservation, Division of Mines and Geology, 1983.
3. "Miranda, California" 7.5 Minute Topographic Quad Map (NE ¼ Garberville 15 Minute quadrangle), United States Geological Survey (USGS), 1970.
4. *Preliminary Foundation Report, Storm Damage Repair, 01HUM 254 PM 5.8, EA: 01-475001, Humboldt County, CA*, prepared by Kleinfelder Engineering, Santa Rosa, CA, November 29, 2007.
5. United States Department of Transportation, Federal Highway Administration-California Division, Damage Assessment Form (DAF) – Title 23, Humboldt County, Highway 254, Post Mile 5.8, Report No. CSC-CT01-124-0, dated 01-09-2006.
6. 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, 2000.

### Subsurface Exploration and Laboratory Testing

Four (4) geotechnical borings, designated R-07-001 through R-07-004, were drilled at this site. The approximate locations of the borings are shown on Plate 2. A monitoring well/slope inclinometer was installed in Boring R-07-002. The slope inclinometer casing was perforated except for the upper 10 feet to permit monitoring of water levels within the casing.

Laboratory testing of selected soil samples obtained from the 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:

Natural moisture content (ASTM D2216).

Unit weight (ASTM D2937).

Mechanical analyses (ASTM D422).

Atterberg Limits tests (ASTM D4318).

Consolidated undrained triaxial strength test (ASTM D4767).

Selected soil samples were forwarded to a Caltrans-approved laboratory (AP Engineering and Testing, Inc., in Pomona, California) for corrosivity tests with regard to the compatibility of the soils with steel reinforcement and concrete. The corrosivity tests included Caltrans Test Methods 532 – pH, 643 – resistivity, 417 – sulfate content, and 422 – chloride content. The laboratory corrosivity test results are summarized below.

### Regional Geology

The site is located on the eastern edge of the Eel River Drainage within 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 18 miles southwest of the site. The site is located approximately 29 miles east of the Mendocino Triple Junction where the Gorda, North American, and the Pacific plates meet. The regional geology is shown on Plate 3.

### Site Geology

According to McLaughlin et al. (2000) the project site is underlain by Yager Terrane bedrock of the Coastal Belt Franciscan Complex. This Eocene to Paleocene age bedrock is comprised of sheared and highly folded mudstone with minor sandstone and conglomerate interbeds.

The area south of the site is mapped as being underlain by the Jurassic-Cretaceous age Broken Formation of the Central Belt Franciscan Complex, which typically consists of conglomeratic meta-sandstone and meta-argillite. A bedrock thrust fault, located approximately 300 feet southeast of the proposed retaining wall at its closest point, separates the two Franciscan Complex units in the site vicinity. Bedrock faults are

common features within the Franciscan Complex and likely occurred during the formation of the geologic units. The features are not considered to be active. The site has also been mapped by Spittler (1983). Neither publication identified any landslide features at the site or within the site vicinity.

### Subsurface Conditions

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

I.D.	Approx. Station	Location <sup>(1)</sup>	Depth of Boring (ft)	Surface Elev. (ft)	Date Completed	Depth to Bedrock (ft)
R-07-001	202+34	14 feet left	75.0	376+/-	8-23-07	41.5
R-07-002	203+41	15 feet left	75.0	376+/-	8-22-07	38.0
R-07-003	204+42	22 feet left	75.0	375+/-	8-21-07	40.0
R-07-004	203+43	21 feet right	65.0	376+/-	8-23-07	28.5

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

Borings R-07-001 through R-07-003 drilled for this investigation encountered asphaltic concrete (1.1 feet of asphaltic concrete at R-07-001 only), aggregate base rock and/or fill consisting of layers of sandy clay, clayey sand and gravel to depths of approximately 4.5 to 6.0 feet, underlain by landslide debris to depths of 38 to 41.5 feet. Then, very soft to soft, decomposed to intensely weathered, very intensely fractured shale (with sandstone interbeds at R-07-001) was encountered to the termination depth of 75 feet.

Boring R-07-004, drilled in the shoulder on the east side of the pavement, encountered a 1.5-foot layer of aggregate base rock underlain by gravelly clay landslide debris to a depth of about 18.5 feet. Then, layers of terrace deposits consisting of clayey sand and clayey sand with gravel were encountered to a depth of about 28.5 feet. Below the terrace deposits, sedimentary rock consisting of soft, slightly weathered, very intensely fractured shale was encountered to the termination depth of 65 feet. The Log of Test Borings will be provided to Structure Design in a separate transmittal.

### Groundwater

The ground water surface elevations (measured from top of casing) between January 2008 and April 2009 in boring R-07-002 ranged between approximately elevation 348 and 355. Based on the back analysis, a groundwater surface elevation of 369 feet at the wall layout line is assumed for design.

### Corrosion Potential

Based on the Caltrans Corrosion Guidelines (2003 version 1.0) and laboratory test results, the site may be considered as non-corrosive to steel and concrete. The lab test report is attached.

### Foundation Recommendations

Slope inclinometer data collected from February 2008 to April 2009 (attached) indicate that the failure surface of the landslide is 17 feet below the ground surface (elevation 359 feet) at boring R-07-002. A soldier pile tieback wall approximately 230 feet in length with a maximum wall height of 20 feet (to bottom of lagging) is recommended.

The following Table 1 summarizes the recommended material properties for design.

<u>Layer</u>	<u>Depth (ft bgs)</u>	<u>Description</u>	<u>Parameters</u>
1	0 to 6	Silty Gravel w/ Sand (Fill)	unit wt = 106 pcf phi = 33° c = 0
2	6 to 20	Clay w/ Gravel and Sand (Landslide Debris)	unit wt = 105 pcf phi = 19° c = 0
3	20 to 36	Clay w/ Gravel and Sand (Dormant landslide debris w/ decomposed rock)	unit wt = 112 pcf phi = 20° c = 0
4	36 to 75	Shale, intensely weathered to decomposed, intensely to very intensely fractured	unit wt = 130 pcf phi = 35° c = 2000 psf

The coefficient of passive lateral earth pressure ( $K_p$ ) for Layer 1 and Layer 2 should be zero.

Based on a stability analysis for a 20-ft high wall, with the recommended design groundwater profile, soil geometry and required horizontal anchor resistance forces, the force necessary to provide a factor of safety of 1.3 was calculated to be 7,061 pounds per lineal foot of wall. This design force is equivalent to that exerted by a fluid with a unit weight of 35 pounds per cubic foot.

We recommend that the piles be embedded a minimum of 10 feet into the Shale bedrock unit (see attached Design Cross Section). A profile showing the elevation of bedrock surface along the wall layout line is attached (Plate 4). We recommend that the tiebacks derive all their capacity from the Shale bedrock unit. Assuming 2 rows of tiebacks at 8 feet and 16 feet below the top of wall at a -20° inclination from horizontal, the unbonded length for the upper and lower row of tiebacks is 57 feet and 43 feet respectively.

Shims should be placed between the timber lagging in conjunction with Class 1 Type B permeable material backfill behind the wall to prevent the buildup of hydrostatic pressure. In addition, we recommend a chimney of permeable material be placed on the downslope side of the buried portion of the wall and an underdrain be constructed near the base of lagging. We will provide detailed recommendations for the chimney and UD in a separate memo.

#### Construction Considerations

Caving conditions may be encountered during drilling for the piles and tiebacks due to the granular nature of portions of fill and landslide deposits, 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.

Overhead and underground utilities have been noted in the proposed wall construction area. The Miranda Community Services District has an existing 6-inch water line that will need to be positively located prior to the start of construction. Design and construction will need to consider these utilities with respect to pile drilling and excavation.

#### Project Information

Standard Special Provisions S5-280, "Project Information," discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information

originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

*Data and information attached with the project plans are:*

A. None

*Data and information included in the Information Handout provided to the bidders and Contractors are:*

A. Foundation Report for HUM 254 PM 5.8 Retaining Wall, dated May 11, 2009

*Data and information available for inspection at the District Office:*

A. None

*Data and information available for inspection at the Eureka Annex:*

A. Rock Cores

If any conceptual changes are made during final project design, the Office of Geotechnical Design North should review those changes to determine if these foundation recommendations are still applicable.

If you have any questions or require further assistance, please call me at (707) 445-6036.



CHARLIE NARWOLD, CEG #2335  
Senior Engineering Geologist  
Office of Geotechnical Design - North  
Branch B



Attachments:

- |               |  |
|---------------|--|
| Attachment 1. | Plate 1 - Site Location                          |
| Attachment 2. | Plate 2 - Site Plan                              |
| Attachment 3. | Layout L-1                                       |
| Attachment 4. | Plate 3 - Regional Geology                       |
| Attachment 5. | Corrosion Test Results                           |
| Attachment 6. | Inclinometer Monitoring Results                  |
| Attachment 7. | Design Cross Section                             |
| Attachment 8. | Plate 4 – Approximate Bedrock Profile Along WLOL |

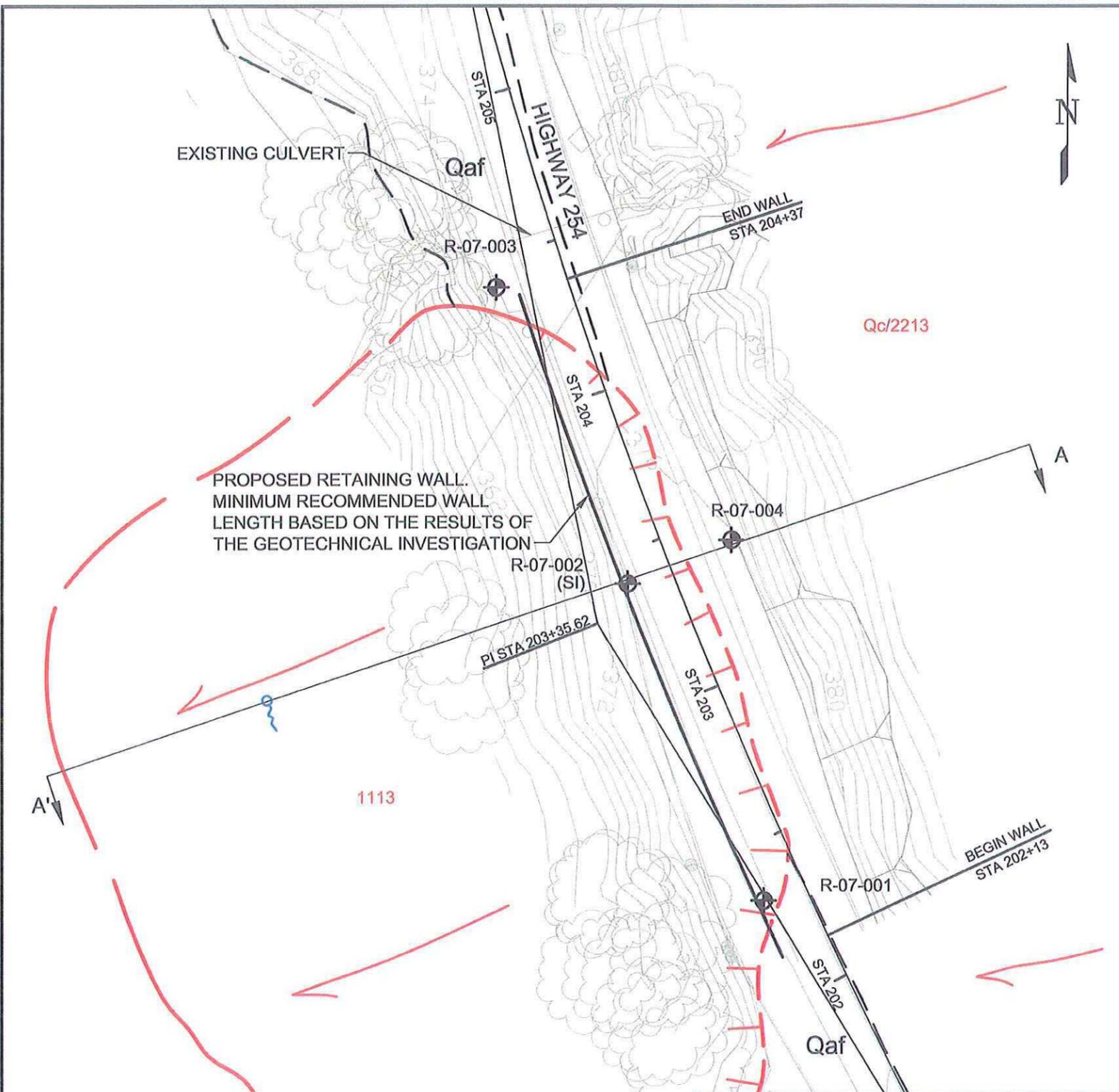
GARY BLAKESLEY  
May 11, 2009  
Page 8

Foundation Report  
01-HUM-254-PM 5.8  
EA 01-475001

c: OGDN Project Folder  
GS File Room

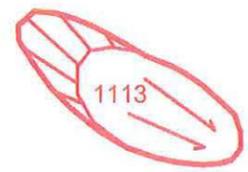


ATTACHED IMAGES: Images: DC\_2502850.jpg  
 ATTACHED XREFS: XRef: Hum254pm5-80-Backgmd; XRef: Hum254pm5-80-Backgmd; XRef: Hum254pm5-80-Backgmd; XRef: Hum254pm5-80-Backgmd  
 CAD FILE: U:\GEO\TECH\PROJECTS\Projects\Active\85401 Caltrans HWY 254 PM 5.10, 5.58, 5.8\CAD\ LAYOUT: Layout1



**EXPLANATION**

- Qaf Artificial Fill
- Qc Colluvium



Landslide: Hatchures Indicate Scarp Area; Arrows Indicate Direction of Movement

2213

Landslide Identification Number (see landslide chart)



Geologic Contact: Dashed Where Approximate



Boring Location

(SI)

Slope Inclinometer



Spring



Section Location

**LANDSLIDE IDENTIFICATION CHART**

**STATE OF ACTIVITY**

- 1=Active or Recently Active (areas of unstable ground with relatively recent/"fresh" geomorphic features such as ground cracks, hummocky topography, exposed soils, abrupt gradient breaks and/or disrupted vegetation, typically recent to 50 years old)
- 2=Dormant (areas of quasi-stable ground, with eroded and subdued geomorphic features, no exposed soils, somewhat re-vegetated but typically with different type or density, typically >50 to several hundreds of years old)
- 3=Ancient (areas of relatively stable ground, typically characterized by large, broad and deep landslides with highly eroded and subdued geomorphic features, re-vegetated with similar type and density, typically several hundreds to several thousands of years old)

**CERTAINTY OF IDENTIFICATION**

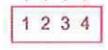
- 1=Definite
- 2=Probable
- 3=Questionable

**DOMINANT TYPE OF MOVEMENT**

- 1=Slump Flow Complex
- 2=Debris Slide
- 3=Debris Flow
- 4=Earth Flow
- 5=Slump
- 6=Translational

**THICKNESS OF DEPOSIT**

- 1=Less Than 5 Feet
- 2=5 to 15 Feet
- 3=15 to 50 Feet
- 4=Greater Than 50 Feet



DRAWN BY:	P. Hubbard
REVISD BY:	
CHECKED BY:	J. Richmond
DATE:	11/07
APPROVED BY:	

**SITE PLAN**

STORM DAMAGE LOCATION  
 EA: 01-475001  
 HIGHWAY 254 P.M. 5.80  
 HUMBOLDT COUNTY, CALIFORNIA

PROJECT NO. 85401-2 FILE NAME: Hum254pm5-80-4.dwg

**KLEINFELDER**

2240 Northpoint Parkway  
 Santa Rosa, CA 95407-5009  
 PH. 707-571-1883 FAX. 707-571-7813  
 www.kleinfelder.com

PLATE  
**2**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**St. Catrans**  
 NORTH REGION  
 PROJECT DEVELOPMENT  
 DESIGN EAST BRANCH M2

FUNCTIONAL SUPERVISOR  
 THOMAS P. WOOD

CALCULATED-DESIGNED BY  
 CHECKED BY

REVISOR  
 HORACIO PARAS JR  
 FERMIN BARRIGA

DATE REVISOR  
 DATE REVISOR

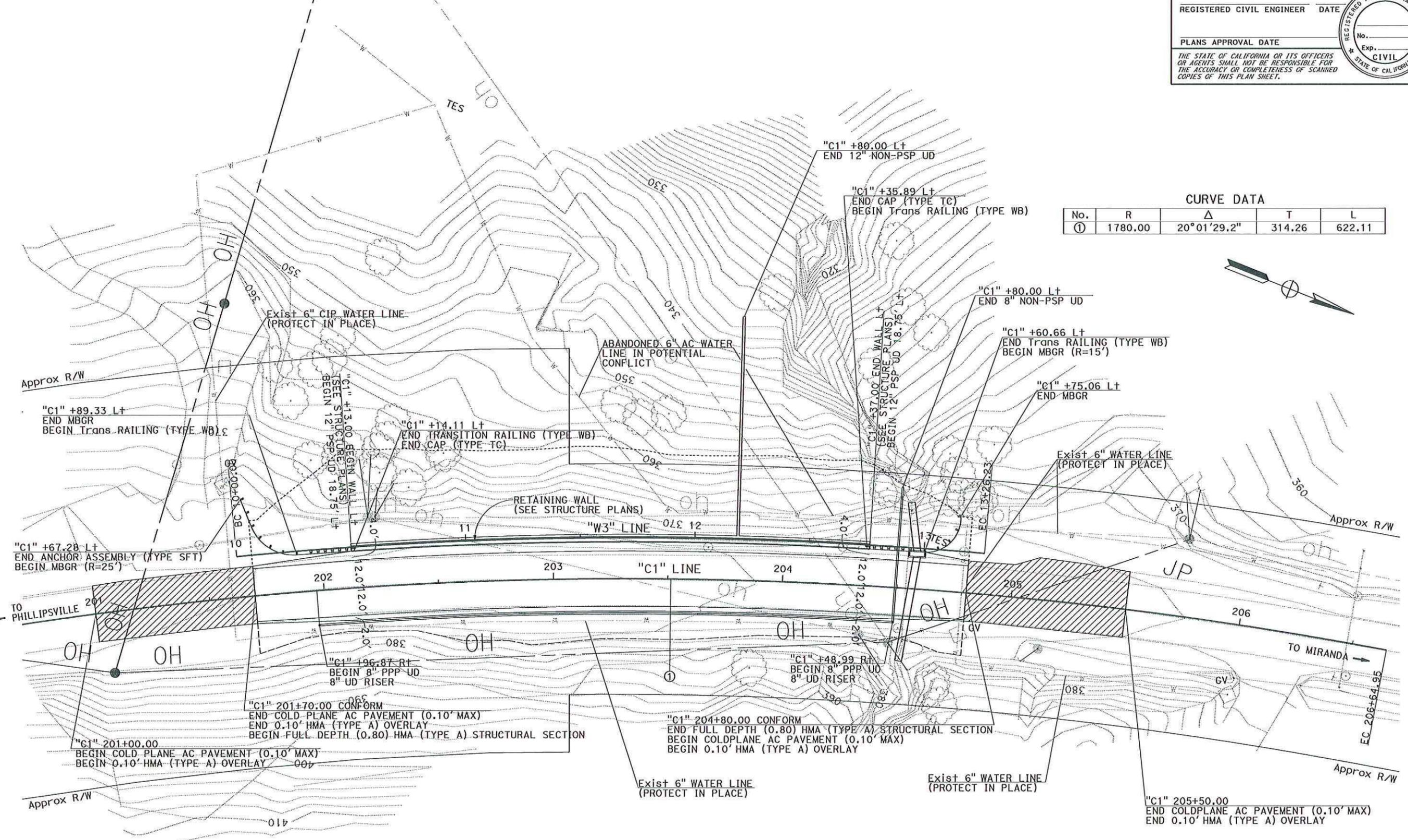
NOTES:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	254	5.9/11.1		

REGISTERED CIVIL ENGINEER DATE \_\_\_\_\_

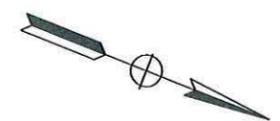
PLANS APPROVAL DATE \_\_\_\_\_

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

CURVE DATA

No.	R	Δ	T	L
①	1780.00	20°01'29.2"	314.26	622.11



SCALE  
 1" = 20'

LAYOUT  
 L-1

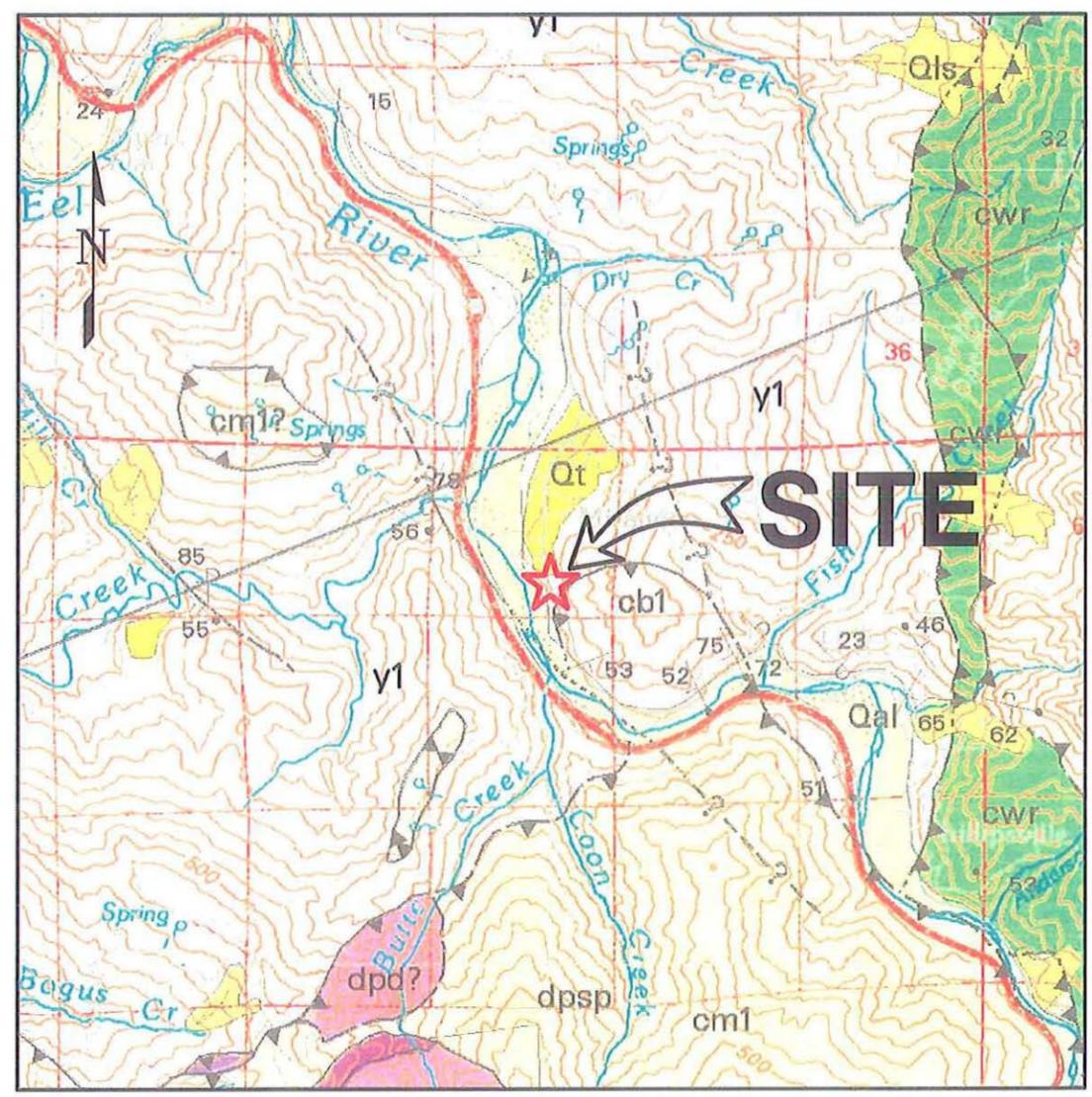
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 ATTACHED XREFS: Pie-L:1200505PROJ  
 CAD FILE: U:\GEO\TECH\_PROJECTS\Projects\Active\85401 Caltrans HWY 254 PM 5.10, 5.58, 5.8\CAD LAYOUT: Layout1

**EXPLANATION**

**MAP SYMBOLS**

- Contact-Dashed where approximate, dotted where concealed, queried where uncertain
- - - Fault-Dashed where approximate, dotted where concealed, queried where uncertain
- ▼▼▼ Thrust fault-Barbs on 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:**
- 10°/20° Inclinèd-Ball denotes top of beds is known from sedimentary features
- ×/× Vertical-Ball denotes top of beds is known from sedimentary features
- ⊕ Horizontal
- 10°/20° Overturned-Ball denotes that top of beds is known from sedimentary features
- 10°/20° Approximate-Based on photo interpretation or estimated dip in field
- 10° Joint-Strike and dip of joint
- 10° Strike and dip of cleavage-Ball denotes that top of flow is known from sedimentary or volcanic features
- Shear foliation:**
- 10° Inclinèd
- Vertical
- Folds:**
- ← Synclinal or synformal axis-showing direction of plunge
- Anticlinàl or antiformal axis-showing direction of plunge
- ⌢ Overturned syncline
- ↘ Landslide-Arrows indicate direction of movement
- Melange Blocks:**
- △ Serpentinite
- Chert
- ◇ Blueschist
- Greenstone
- <sup>10</sup> Fossil locality and number

- Qal Alluvial deposits (Holocene and late Pleistocene?)-Clay, silt, sand, gravel, and boulders, deposited in stream beds, alluvial fans, terraces, flood plains and ponds; and soils formed on these deposits. Includes largely Holocene deposits in modern stream channels and on flood plains
- Qt Undifferentiated nonmarine terrace deposits (Holocene and Pleistocene)-Dissected and (or) uplifted gravel, sand, silt, and clay, deposited in fluvial settings. In western Eureka quadrangle (Sheet 1) unit includes minor shallow marine intertongues and warped and tilted beds of late Pleistocene Hookton and Rohnerville Formations of Ogle (1953), in addition to younger late Pleistocene and Holocene fluvial terrace units a few feet to a few tens of feet higher than normal modern high-water level
- y1 Sheared and highly folded mudstone-Includes minor rhythmically interbedded sandstone, locally with lenses of conglomerate. Exhibits irregular topography lacking a well-incised system of sidehill drainages
- cm1 Melange-Predominantly penetratively sheared, locally tuffaceous, scaly meta-argillite and less abundant blocks of metasandstone. Exhibits rounded, poorly incised, lumpy and irregular topography
- cb1 Broken formation-Consists of bedded to massive, locally folded, rarely conglomeratic metasandstone and meta-argillite, with only minor amounts of highly sheared rocks. Exhibits sharp-crested topography with regular, well-incised sidehill drainages
- cwr White Rock metasandstone of Jayko and others (1989) (Paleogene and (or) Late Cretaceous)-Arkosic metasandstone and minor meta-argillite, thick bedded to massive, shattered and sheared; commonly extensively veined with laumontite and calcite; metasandstone has 1 to 25 percent detrital K-feldspar and prominent detrital biotite. Unit occurs as slabs and blocks up to several kilometers long, mostly along west side of the Central belt. Unit is named for similar metasandstone described in the Covelo 1:100,000 quadrangle (Jayko and others, 1989) that contains dinoflagellates of late Cretaceous age. Some blocks of the White Rock metasandstone possibly have been tectonically incorporated into the Central belt from the structurally underlying Coastal belt, and thus could be Paleocene or Eocene in age. A carbonate concretion from melange adjacent to the White Rock metasandstone along the western side of the Central belt in the Covelo quadrangle was found to contain Paleocene dinoflagellates (A. Jayko, oral comm., 1993)
- dpb Basaltic flows and keratophyric tuff (Jurassic?)-Uralitic and intruded locally by mylonitic quartz keratophyre dike rocks, present locally along west boundary of Central belt of Franciscan Complex near Benbow (Sheet 3) Diabase (Jurassic?)-Dikes and sills, fine to coarse grained, with ophitic texture, present below basalt flows near Benbow and forms Bear Buttes north of Garberville (Sheet 3). Lower part of diabase unit of Bear Buttes locally includes minor cumulate gabbro. Lower diabase contact considered to be an attenuation fault
- dpsp Serpentinite melange (Jurassic?)-Partially to completely serpentinized ultramafic rocks (harzburgite, dunite), locally highly sheared, and includes minor masses of cumulate gabbro, diabase or basalt. Present beneath diabase and (or) basalt of the Benbow and Bear Buttes areas (Sheet 3). Contact with overlying ophiolitic rocks probably is an attenuation fault. Unit is partially equivalent to some serpentinite interspersed with and assigned to Central belt of Franciscan Complex



DRAWN BY: P. Hubbard		<b>REGIONAL GEOLOGY</b>	<b>KLEINFELDER</b>	PLATE	
REVISÉD BY:				2240 Northpoint Parkway Santa Rosa, CA 95407-5009 PH. 707-571-1883 FAX. 707-571-7813 www.kleinfelder.com	<b>3</b>
CHECKED BY: J. Richmond	DATE: 11/07	APPROVED BY: <i>[Signature]</i>	STORM DAMAGE LOCATION EA: 01-475001 HIGHWAY 254 P.M. 5.80 HUMBOLDT COUNTY, CALIFORNIA		
PROJECT NO. 85401-2		FILE NAME: Hum254pm5-80-2.dwg			



AP Engineering & Testing, Inc.

## CORROSION TEST RESULTS

Client Name: Kleinfelder  
Project Name: Caltrans  
Project No.: 85401

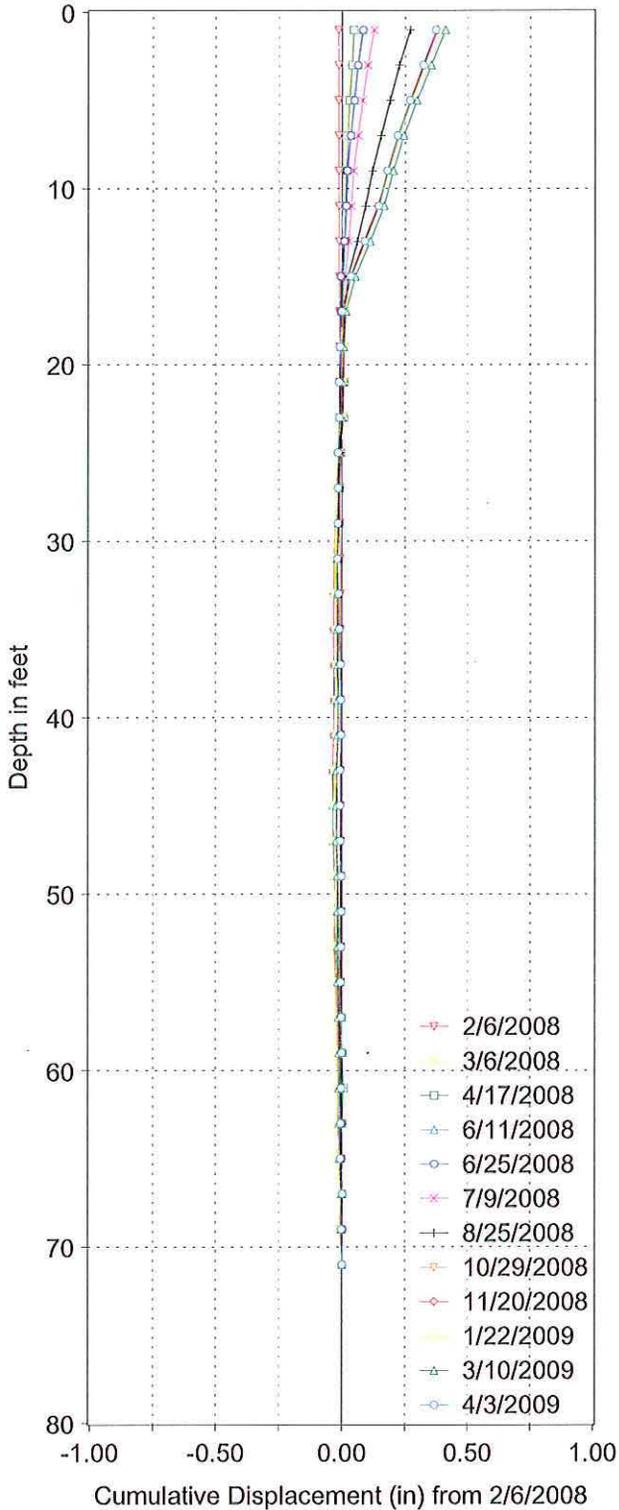
AP Job No.: 27-0928  
Date: 09/19/07

EA # Highway & PM	Boring No.	Remarks	Soil Type	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (%)	Chloride Content (%)
EA01-475001 HUM 254 PM 5.8	R-07- 004	13+15 ft	CL	2200	7.3	0.0005	0.0146
EA01-475001 HUM 254 PM 5.8	R-07- 001	20 ft	CL	1800	7.4	0.0087	0.0070
EA01-475101 HUM 254 PM 5.58	R-07- 004	10.5-15.5 ft	CL	1900	7.3	0.0004	0.0074
EA01-475101 HUM 254 PM 5.58	R-07- 002	30 ft	CL	1700	7.4	0.0003	0.0135
EA01-475101 HUM 254 PM 5.1	R-07- 004	13 ft	CL	1700	7.4	0.0043	0.0129
EA01-475101 HUM 254 PM 5.1	R-07- 002	32 ft	CL	2200	7.6	0.0016	0.0127

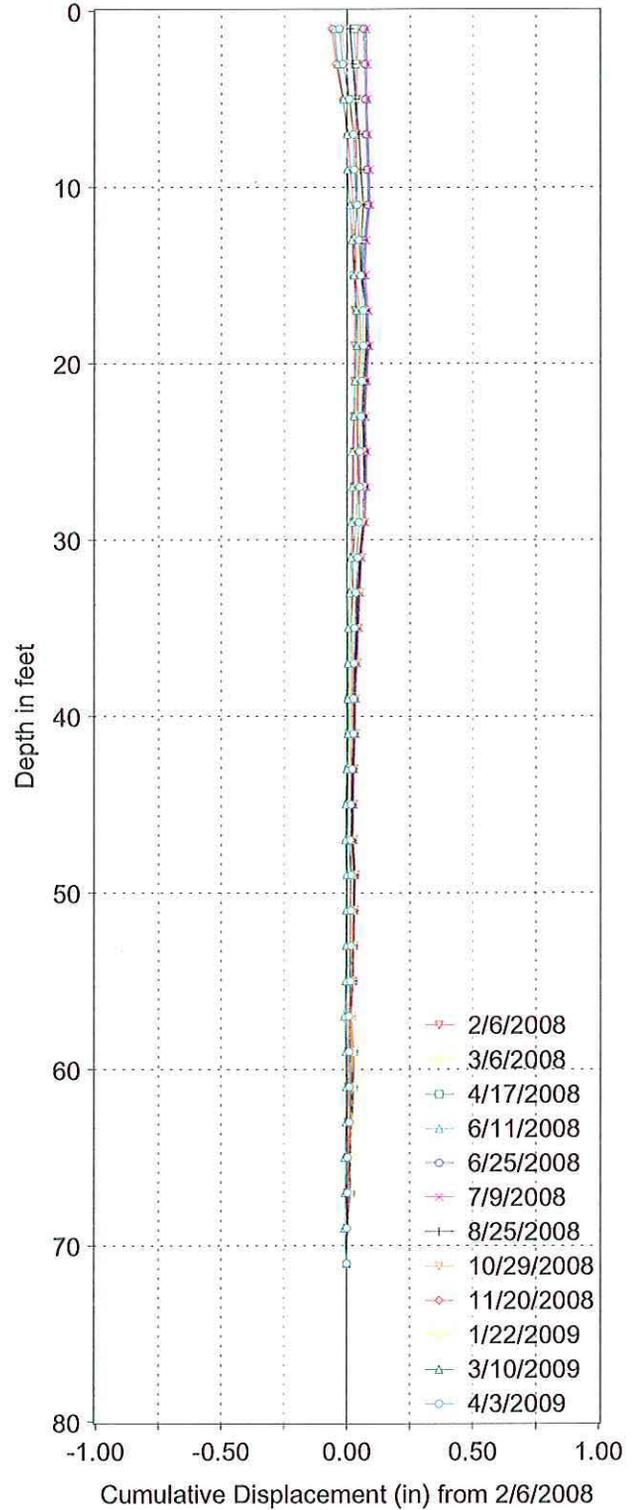
NOTES: Resistivity Test and pH: California Test Methods 532 and 643  
Sulfate Content : California Test Method 417  
Chloride Content : California Test Method 422  
ND = Not Detectable  
NA = Not Sufficient Sample  
NR = Not Requested

2607 Pomona Boulevard, Pomona, CA 91768  
Tel. (909) 869-6316 Fax. (909)869-6318

HUM254 MS02, A-Axis



HUM254 MS02, B-Axis

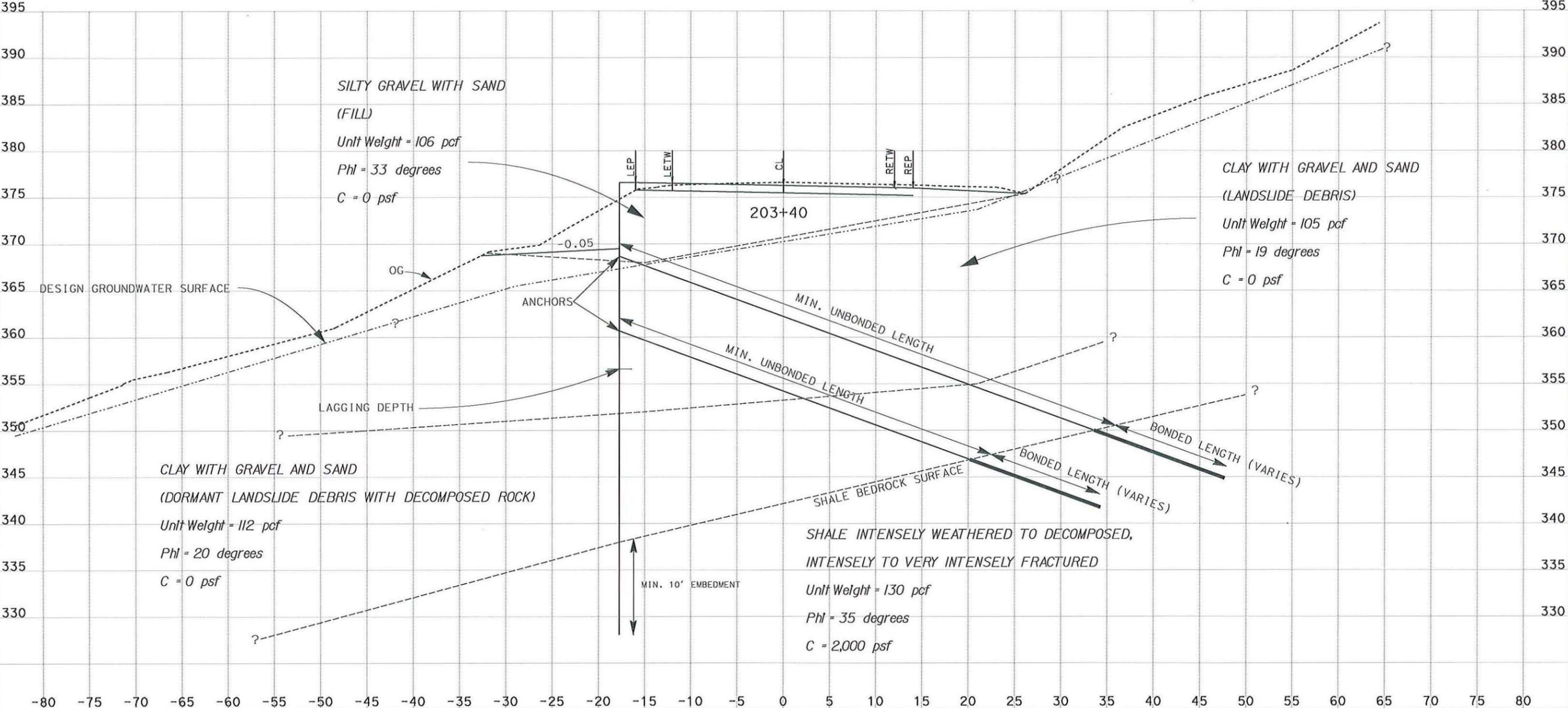


**INCLINOMETER MONITORING RESULTS**

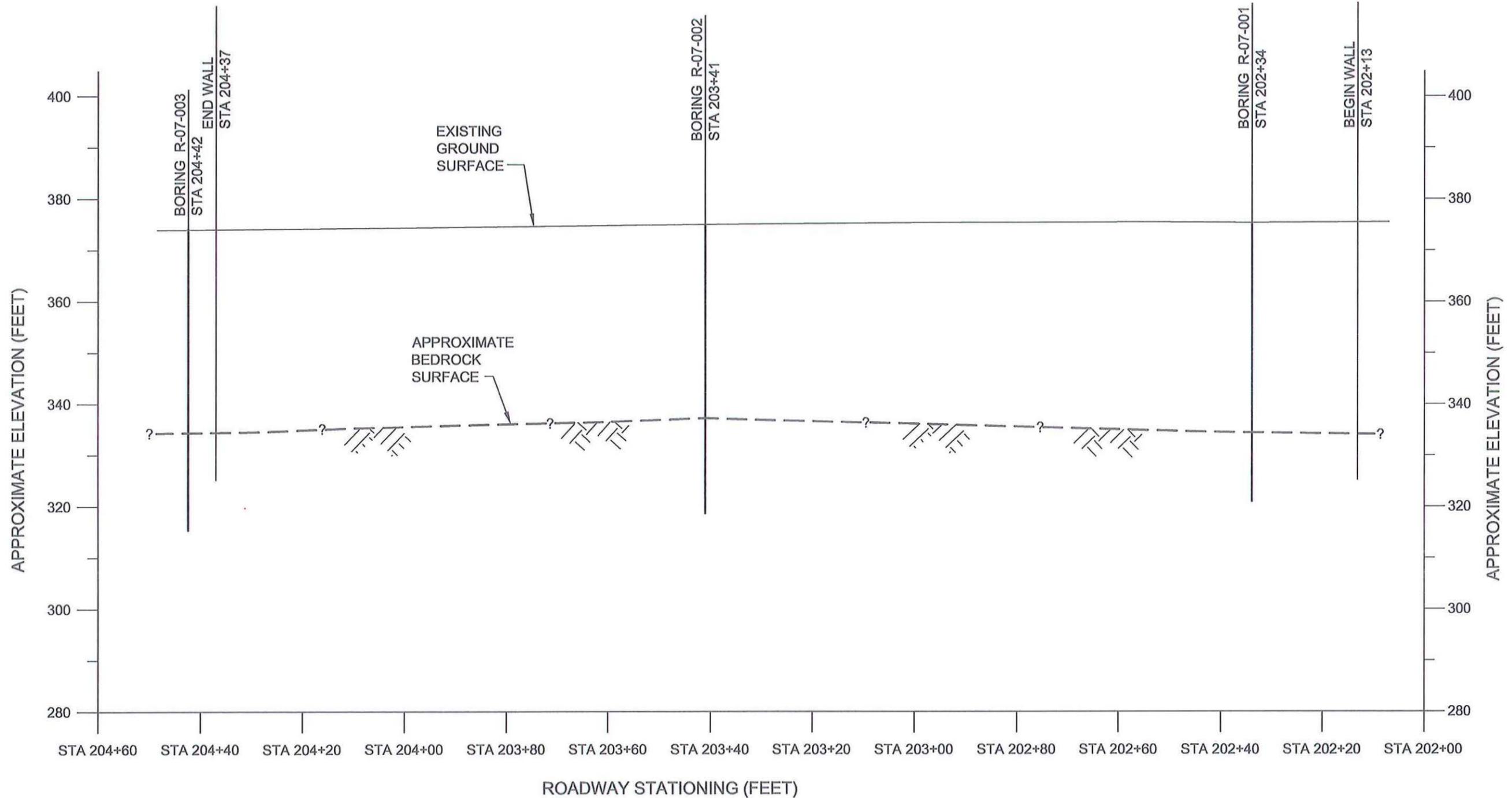
01-HUM-254-PM 5.8  
 Miranda Sink  
 E.A. No.: 01-475001

Depth of Inclinator Casing: 71 feet  
 Ao Direction: 243° (Magnetic North)  
 Location (WGS-84) : 40°13.727N, 123°49.440 W

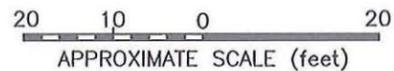
# DESIGN CROSS SECTION



ATTACHED IMAGES: Images: DC\_2503301.jpg  
 ATTACHED XREFS: CAD FILE: U:\GEO\TECH\_PROJECTS\Projects\Active\85401 Caltrans HWY 254 PM 5.10, 5.58, 5.8\CAD\ LAYOUT: Layout1  
 FILE: L:\2005\05PROJ



**NOTE:**  
 The depth of bedrock indicated on this plate was generalized by interpolation and extrapolation between widely spaced borings. Information on bedrock depth exists only at the specific boring locations, which are offset from the proposed wall location. Bedrock depths shown should be considered approximate and variations should be expected.



DRAWN BY: P. Hubbard		<b>APPROXIMATE BEDROCK PROFILE ALONG WALL</b>	<b>KLEINFELDER</b>	PLATE  <b>4</b>
REVISED BY:				
CHECKED BY: J. Richmond		STORM DAMAGE SITE EA: 01-475001 HIGHWAY 254 PM 5.80 HUMBOLDT COUNTY, CALIFORNIA	2240 Northpoint Parkway Santa Rosa, CA 95407-5009 PH. 707-571-1883 FAX. 707-571-7813 www.kleinfelder.com	
DATE: 11/07	APPROVED BY: <i>[Signature]</i>			
		PROJECT NO. 85401-1	FILE NAME: Hum254pm5-80-6.dwg	

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***TECHNICAL MEMORANDUM***

Engineering

Geotechnical Engineering  
Materials Testing & Inspection  
Environmental Science &

Water Resources  
Earthquake Engineering  
Air Quality

Date: November 29, 2007

To: Charlie Narwold, Senior Engineering Geologist  
State of California, Department of Transportation  
Division of Engineering Services  
Office of Geotechnical Design North  
Branch B

From: Don R. Poindexter, G.E.  
William V. McCormick, C.E.G.

Kleinfelder Project: 85401/2

Subject: Preliminary Foundation Report  
Storm Damage Repair  
HUM 254 PM 5.8  
EA: 01-475001  
Humboldt County, CA

---

**1 PROJECT DESCRIPTION**

During the winter of 2005/2006 a landslide occurred on the west (downhill) side of Highway 254, near milepost 5.8, south of Miranda, 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 main landslide scarp is approximately 260 feet long and the landslide mass extends greater than 200 feet downslope to the west (see Plate 3, Section A-A'). The landslide scarp is located partly within the west shoulder and extends into the highway pavement, crossing the southbound lane and extending into the northbound lane up to approximately 7.5 feet at the time of this investigation. 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 landslide-related movement. Stabilization of the landslide as a whole is not part of this project and the main mass of the landslide may continue to move downslope of the proposed wall after the retaining structure is constructed.

## **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 four exploratory borings.
- Installation of one Slope Inclinator casing.
- Laboratory testing of selected samples from the borings.
- Global stability analyses.
- Preparation of this summary 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 254, Post Mile 5.8 to 5.9, dated 1-09-06.

1983, Spittler, T.E., California Geological Survey [formerly the Division of Mines and Geology] Open File Report 83-25, Geology and Geomorphic Features Related to Landsliding, Miranda 7.5' Quadrangle, Humboldt County, California

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 November 2004.

## **4 PROPOSED STRUCTURE DESCRIPTION**

It is proposed to construct a retaining structure on the west 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. The wall will be located west of the road shoulder, approximately 16 feet from the centerline, in the location shown on Plate 2. Based on geotechnical considerations, as discussed below, the proposed wall will be

a minimum length of about 224 feet. Design of the wall, including length and location, will be determined by Caltrans.

## 5 SITE DESCRIPTION AND TOPOGRAPHY

At Post Mile 5.80, the two lane Highway 254 roadway is relatively flat, rising gently to the north. Slope gradients west (downslope) of the roadway range from approximately 1.25H:1V (Horizontal:Vertical) on the existing fill prism to as flat as 3H:1V further down slope within the landslide mass. The cut slopes bordering the east edge of the roadway were constructed at gradients ranging between approximately 1.4H and 1.6H:1V in the vicinity of the landslide feature. Gradients above the cut slope flatten slightly to approximately 2.5H:1V.

The landslide movement currently impacting the roadway is rotational/translational (slump-flow), with an estimated mass thickness of approximately 40 feet. The arcuate headscarp of the landslide extends up to 7.5 feet east (up slope) of the roadway centerline. The location of the headscarp was largely obscured during our field exploration by recent roadway resurfacing. Localized tension cracking and pavement distress/settlement along the scarp location indicated on the 2007 topographic survey provided by Caltrans was visible, however. Our subsurface investigation, analysis of aerial photographs (Caltrans, 1979-1993), and topographic maps of the area, as well as subdued hummocky topography identified upslope and downslope of the roadway suggest the active landslide feature currently impacting Highway 254 may represent localized activity within a much larger, currently dormant landslide. In addition, shallow, localized raveling of the cut slopes was noted directly above the active landslide feature.

Sheet flow from the cut slopes and the east lane roadway are collected within a v-ditch adjacent to the expansive gravel shoulder in the vicinity and captured within a corrugated metal culvert which extends below the roadway and outfall downslope to the west. The observed culvert is near the north side of the landslide area and proposed retaining wall. The condition of the culvert was not surveyed as part of this study. As necessary, the culvert may require repair, replacement, or relocation further outside the landslide and retaining wall limits. Drainage from the west lane within the landslide currently flows down over the slope face of the fill prism.

Due to recent grading, the fill prism slope face is denuded of any form of vegetation. The cut slopes are sparsely vegetated with a low to moderate growth of wild grasses. The areas west of the fill slope and east of the cut slope support a tall growth of wild grasses, poison oak, and mature oak and fir trees.

**6 SUBSURFACE EXPLORATION AND LAB TESTING****SUBSURFACE INVESTIGATION**

Four (4) exploration borings, designated R-07-001 through R-07-004, were drilled at this site by Caltrans Office of Drilling Services and Woodward Drilling using rotary wash drilling methods. Drilling was performed on August 21, 2007 through August 23, 2007. All drilling and sampling operations were supervised by Kleinfelder staff. Borings R-07-001 and R-07-003 were advanced with a truck-mounted Mobile B-47 drill rig and Borings R-07-002 and R-07-004 were advanced with a truck-mounted Mobile B-57 drill rig. The drilling utilized 114mm (HWT) and 96mm (HQ) casing, equipped with a tri-cone mill-tooth bit and a #8 diamond impregnated core bit, respectively. Boring R-07-001 was advanced from the Highway 254 pavement level in the south-bound traffic lane to a maximum depth of approximately 75 feet. Borings R-07-002 and R-07-003 were advanced from the gravel shoulder adjacent to the south bound lane of 254, to a maximum depth of approximately 75 feet. Boring R-07-004 was advanced from the gravel shoulder adjacent to the north-bound lane to a maximum depth of approximately 65 feet. The approximate locations of the borings are shown on Plate 2.

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 Penetrometer Test samplers each driven with a 140-pound hammer dropped 30 inches. The blows required to drive the Modified California and Standard Penetrometer Test samplers were recorded for each 6 inches of penetration or fraction thereof. Visual classifications were made in accordance with the attached Boring Record Legend. The results of the exploration are summarized on the attached Boring Records.

As part of this work, one slope inclinometer casing was installed to approximately 74.5 feet below the ground surface within the bore hole for Boring R-07-002. 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. The inclinometer was completed at the surface with a traffic-rated access box. No inclinometer readings or water level measurements were obtained at the time of installation. We understand Caltrans will perform the readings or monitoring, as required.

## 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:

Natural moisture content (ASTM D2216).

Unit weight (ASTM D2937).

Mechanical analyses (ASTM D422).

Atterberg Limits tests (ASTM D4318).

Consolidated undrained triaxial strength test (ASTM D4767).

The results of the geotechnical laboratory testing are provided in the attached Lab Test Summary.

Selected soil samples were forwarded to a Caltrans-approved laboratory (AP Engineering and Testing, Inc., in Pomona, California) for corrosivity tests with regard to the compatibility of the soils with steel reinforcement and concrete. The corrosivity tests included Caltrans Test Methods 532 – pH, 643 – resistivity, 417 – sulfates, and 422 – chlorides. The laboratory corrosivity test results are summarized below in Section 9 and the lab test reports are attached to the end of this report.

## **7 SITE GEOLOGY AND SUBSURFACE CONDITIONS**

### REGIONAL GEOLOGY

The site is located on the eastern edge of the Eel River Drainage within 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 18 miles southwest of the site. The site is located approximately 29 miles east of the Mendocino Triple Junction where the Gorda, North American, and the Pacific plates meet. Regional Geology is shown on Plate 4.

## SITE GEOLOGY

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 low hills west/southwest of the Eel River are underlain by Yager Terrane bedrock of the Coastal Belt Franciscan complex. This Eocene to Paleocene age bedrock is comprised of sheared and highly folded mudstone with minor sandstone and conglomerate interbeds.

The area south of the site is mapped as being underlain by the Jurassic-Cretaceous age Broken Formation of the Central Belt Franciscan Complex bedrock, which typically consists of conglomeratic meta-sandstone and meta-argillite. A bedrock thrust fault, located approximately 300 feet southeast of the proposed retaining wall at its closest point, separates the two Franciscan Complex units in the site vicinity. Bedrock faults are common features within the Franciscan Complex and likely occurred during the formation of the geologic units. The features are not considered to be active. The Eel River bed located southwest (down slope) of the site is shown to be underlain by Quaternary age alluvial deposits consisting of clay, silt, sand, and gravel. The flat area surrounding the town of Miranda slightly north of the site is mapped as being underlain by Quaternary age (Holocene to Pleistocene) non-marine terrace deposits, comprised of dissected and/or uplifted gravel, sand, silt and clay deposited in a fluvial setting.

The site has also been mapped by Spittler (1983, California Geological Survey [formerly the Division of Mines and Geology] Open File Report 83-25, Geology and Geomorphic Features Related to Landsliding, Miranda 7.5' Quadrangle, Humboldt County, California). Spittler (1983) indicates the site and surrounding vicinity is underlain by Tertiary to Cretaceous age Yager Formation. The Eel River bed is mapped as being underlain by Quaternary age stream channel deposits, while the flat area surrounding Miranda immediately north of the site is shown to be underlain by Quaternary age terrace deposits.

Neither publication identified 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: Boring Summary**

<b>I.D.</b>	<b>Approx. Station</b>	<b>Location <sup>(1)</sup></b>	<b>Depth of Boring (ft)</b>	<b>Surface Elev. (ft)</b>	<b>Date Completed</b>	<b>Depth to Bedrock (ft)</b>
R-07-001	202+34	14 feet left	75.0	376+/-	8-23-07	41.5
R-07-002	203+41	15 feet left	75.0	376+/-	8-22-07	38.0
R-07-003	204+42	22 feet left	75.0	375+/-	8-21-07	40.0
R-07-004	203+43	21 feet right	65.0	376+/-	8-23-07	28.5

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

Borings R-07-001 through R-07-003 drilled for this investigation encountered asphaltic concrete (1.1 feet of asphaltic concrete at R-07-001 only), aggregate base rock and/or fill consisting of layers of sandy clay, clayey sand and gravel to depths of approximately 4.5 to 6.0 feet, underlain by landslide debris layers to depths of 38 to 41.5 feet. Then, very soft to soft, decomposed to intensely weathered, very intensely fractured shale (with sandstone interbeds at R-07-001) was encountered to the termination depth of 75 feet.

Boring R-07-004, drilled in the shoulder on the east side of the pavement, encountered a 1.5-foot layer of aggregate base rock underlain by gravelly clay landslide debris to a depth of about 18.5 feet. Then, layers of terrace deposits consisting of clayey sand and clayey sand with gravel were encountered to a depth of about 28.5 feet. Below the terrace deposits, sedimentary rock consisting of soft, slightly weathered, very intensely fractured shale was encountered to the termination depth of 65 feet.

## 8 GROUNDWATER

Due to the use of drilling fluid, it was not possible to record groundwater depths at the time of drilling. Moisture/density tests results indicate that most samples below a depth of approximately 10 feet were saturated or nearly saturated. A spring was observed on the slope approximately 130 feet west of the centerline of the roadway at the location shown on Plates 2 and 3. Future groundwater monitoring may be feasible in the one inclinometer casing that was installed. Results of groundwater monitoring can be provided in a Final Foundation Report.

## **9 CORROSION POTENTIAL**

Chemical analyses were performed on two (2) 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 to this report. Based on the Caltrans Corrosion Guidelines (2003 Version 1.0) and laboratory test results, the site may be considered as 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 November 2004), the nearest fault is the Russ fault, which is located approximately 6.1 miles north of the site. The Russ fault is a fault of unknown mechanism (style) capable of generating earthquakes with a maximum credible earthquake (MCE) magnitude of 7.50. The Caltrans Seismic Hazard Map and Report (1996) locates the site between the 0.4g and 0.5g Peak Bedrock Acceleration (PBA) contours associated with the Russ fault. We recommend a PBA value of 0.5g and corresponding Peak Ground Acceleration (PGA) of 0.5g for the analysis and design of the proposed Highway 254 retaining wall. The PGA is estimated based on site soil class C. The fault and PBA map is shown on Plate 5.

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. The bedrock fault contact identified by McLaughlin et al. (2000) is a common feature within the Franciscan Complex and likely occurred during the formation of the geologic units. The features are not considered to be active. As such, the possibility of primary surface rupture or deformation at the site is considered low.

## **11 GEOTECHNICAL AND FOUNDATION RECOMMENDATIONS**

### **WALL LOCATION**

The anticipated location of the proposed wall is shown on Plate 2. Both ends of the proposed wall terminate approximately 10 feet outside the limits of the landslide (as presently mapped), for a total length of approximately 224 feet. The design of the wall, including final length and location, will be determined by Caltrans.

SOIL AND ROCK PARAMETERS

Based on the results of our subsurface investigation and initial laboratory testing, subsurface materials within the retained height of the proposed retaining wall consists of fill, terrace deposits, and landslide debris overlying very soft, very intensely fractured and decomposed to slightly weathered bedrock mainly comprised of shale with occasional sandstone interbeds. 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. Standard surcharge pressures should be applied to the top of the walls in accordance with Caltrans Standard Plans.

**Table 2: Soil/Rock Parameters for Retaining Wall Design**

Type	Approximate Thickness at Boring Locations (ft)	Total Unit Weight (pcf)	Angle of Internal Friction, $\phi$ (degrees)	Cohesion, c (psf)	$K_a$	$K_p$
Fill (Qaf) (AC/SM/GP/CL/SC)	1.5-6	135	19 <sup>1</sup>	0 <sup>1</sup>	0.46 <sup>4</sup>	NA
Terrace Deposits (Qt) (SC)	10	139	35 <sup>1</sup>	0 <sup>1</sup>	NA	NA
Shale Bedrock (TKfy1)	NA	143	35 <sup>2</sup>	0 <sup>2</sup>	0.25 <sup>4</sup>	7.5 <sup>4</sup>
Landslide Debris- (CL/SC/SM/GC)	17-37	135	19 <sup>3</sup>	50 <sup>3</sup>	0.46 <sup>4</sup>	NA

<sup>1</sup> Estimated based on correlations with blowcounts, laboratory tests and soil type and was included in the back-figured calculations (see Note 3).

<sup>2</sup> Estimated from laboratory tests.

<sup>3</sup> Back-figured value assuming existing landslide has a factor of safety of 1.0.

<sup>4</sup> Coulomb method of analysis with  $\delta = \phi/2$

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

### Tied-Back Anchors

Due to differences in strain compatibility between soil and bedrock, if tiebacks are used, we recommend that they derive their support from the bedrock formation. The tieback unbonded length will depend on the tieback inclination, elevation, and the overall wall height. Recommended unbonded lengths based on the preliminary wall design can be provided in a Final Foundation Report.

### Soldier Piles

Soldier piles should gain their vertical resistance from friction in the fractured bedrock. Because of the fractured nature of the rock, and the difficulty in removing slough from drilled holes, end bearing resistance should be neglected. As discussed in Section 12 of this memorandum, tied-back soldier piling should have a minimum embedment of 10 feet into bedrock to provide a factor of safety of 1.5 against global instability. Cantilever soldier piling will require deeper penetrations based on wall stability analyses. Recommended pile tip elevations based on axial loads (to be provided by Caltrans Structure Design) can be reported in a Final Foundation Report.

The depth to bedrock will be variable. The three borings closest to the wall encountered bedrock at depths of 38 to 41.5 feet. A sketch of estimated bedrock depth along the length of the wall is provided on Plate 6.

### 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.

### Lagging

The purpose of the proposed wall is to protect the road from active landslide-related movements, not to stabilize the landslide mass. It should be assumed that the landslide mass will continue to move and will eventually pull away from the downhill side of the wall. This can result in the loss of material between the pilings. To protect against loss of material, we recommend that lagging extend down to the bedrock surface. As

illustrated on Plate 6, this would require excavating to depths of up to about 38 to 41.5 feet below existing grades, 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 piling so that will limit the internal loss of soil without the use of lagging. However, over time or in the presence of groundwater, loss of soil could still be significant and future maintenance may be necessary.

## **12 SLOPE STABILITY REVIEW**

Kleinfelder performed an analysis of global stability of the existing slope in order to estimate the factor of safety against sliding below the bottom of a retaining wall. The slope was modeled using "Slide" version 5.03 by Rocscience. The wall was modeled as a rigid block so that the analysis was independent of the type of wall to be constructed. Based on this analysis, a minimum pile penetration into bedrock of 5 feet is necessary to provide a factor of safety of 1.5. However, we recommend a minimum pile penetration of 10 feet to compensate for potential variations in rock quality. Output from our slope stability analysis is presented on Plate 7.

Our analysis assumed the spring shown on the cross section, Plate 3, at the surface of the landslide mass is localized and not typical of the entire landslide. We recommend re-evaluating the analysis when water level readings have been provided by Caltrans. Hydroaugers may be required for drainage to draw down potential water levels to obtain an adequate factor of safety, given the parameters used in this study.

## **13 CONSTRUCTION CONSIDERATIONS**

- Materials to be excavated will consist of fill, slide debris, and 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 underwater. 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 structures and all excavations toward suitable, non-erosive drainage devices. Any pipes or lined ditches that cross areas of landsliding (see Plate 2) are likely to be damaged by future movement. We recommend that surface drainage be collected in pipelines that are routed outside of landslide areas and that exit below the toe of the landslide.

## **14 CLOSURE**

A Final Foundation Report can be provided once we receive the preliminary wall design. If you have any questions, please contact us at 707.571.1883.

**15 ATTACHMENTS**

Plate 1 Site Location

Plate 2 Site Plan

Plate 3 Section A-A'

Plate 4 Regional Geology

Plate 5 California Seismic Hazard Map

Plate 6 Bedrock Profile Along Proposed Retaining Wall

Plate 7 Results of Slope Stability Analyses

Boring Record Legend (3 pages)

Boring Records (12 pages)

Log of Test Borings (LOTBs, 6 pages)

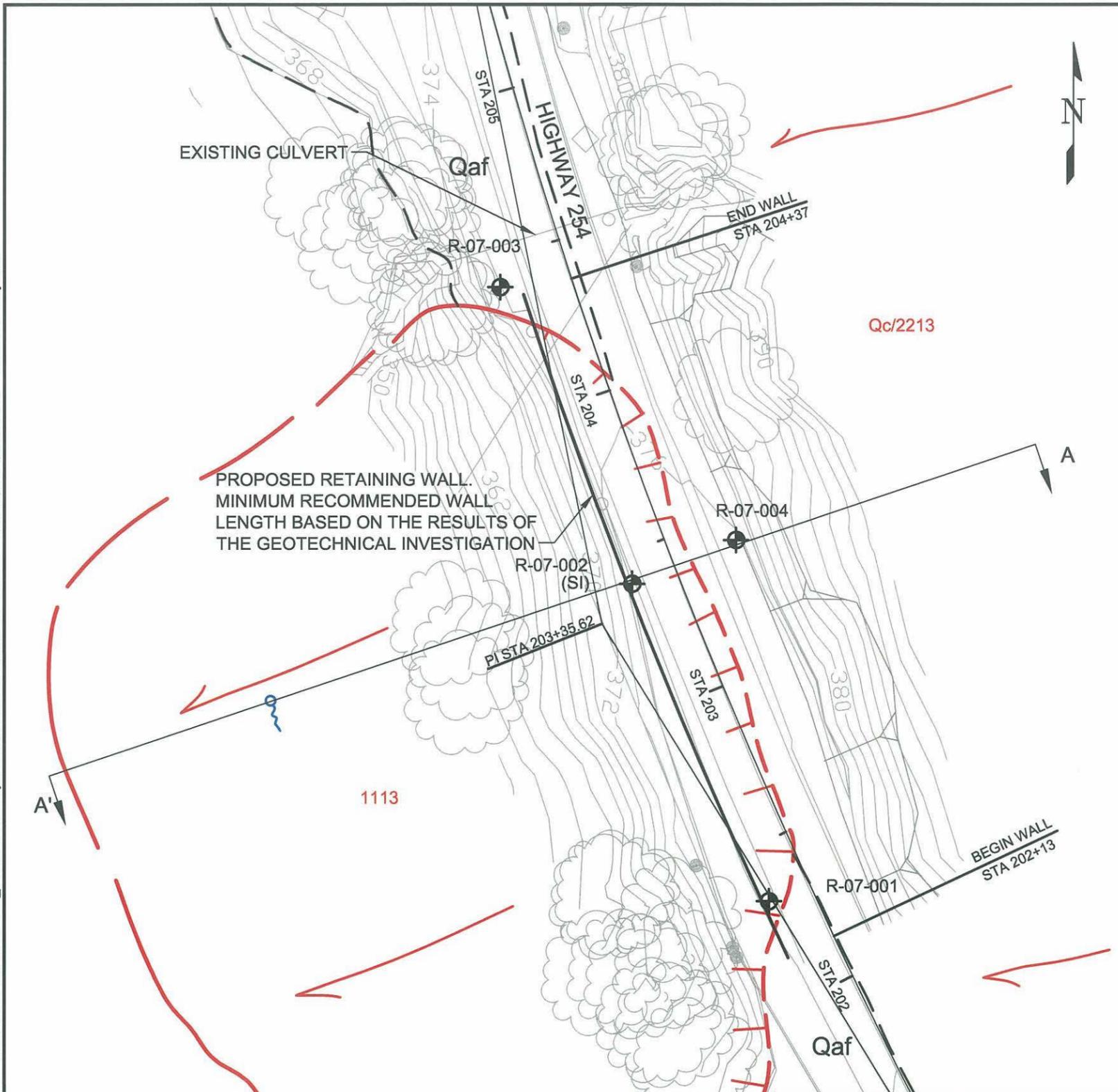
Laboratory Test Summary

Laboratory Test Reports (4 pages)

Corrosion Test Results (AP Engineering and Testing, Inc.)



ATTACHED IMAGES: Images: DC\_2502850.jpg  
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 XRef: Mem254pm5-80-Backgrnd  
 XRef: Mem254pm5-80-Backgrnd  
 CAD FILE: U:\GEO\TECH\_PROJECTS\Projects\Active\85401 Caltrans HWY 254 PM 5.10, 5.58, 5.8\CAD\ LAYOUT: Layout1  
 Pie-L: 200505PROJ



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**EXPLANATION**

- Qaf Artificial Fill
- Qc Colluvium
- Landslide: Hatchures Indicate Scarp Area; Arrows Indicate Direction of Movement
- 2213 Landslide Identification Number (see landslide chart)
- Geologic Contact: Dashed Where Approximate
- Boring Location
- (SI) Slope Inclinometer
- Spring
- Section Location

**LANDSLIDE IDENTIFICATION CHART**

- STATE OF ACTIVITY**
  - 1=Active or Recently Active (areas of unstable ground with relatively recent/"fresh" geomorphic features such as ground cracks, hummocky topography, exposed soils, abrupt gradient breaks and/or disrupted vegetation, typically recent to 50 years old)
  - 2=Dormant (areas of quasi-stable ground, with eroded and subdued geomorphic features, no exposed soils, somewhat re-vegetated but typically with different type or density, typically >50 to several hundreds of years old)
  - 3=Ancient (areas of relatively stable ground, typically characterized by large, broad and deep landslides with highly eroded and subdued geomorphic features, re-vegetated with similar type and density, typically several hundreds to several thousands of years old)
- CERTAINTY OF IDENTIFICATION**
  - 1=Definite
  - 2=Probable
  - 3=Questionable
- DOMINANT TYPE OF MOVEMENT**
  - 1=Slump Flow Complex
  - 2=Debris Slide
  - 3=Debris Flow
  - 4=Earth Flow
  - 5=Slump
  - 6=Translational
- THICKNESS OF DEPOSIT**
  - 1=Less Than 5 Feet
  - 2=5 to 15 Feet
  - 3=15 to 50 Feet
  - 4=Greater Than 50 Feet

DRAWN BY: P. Hubbard	
REVISED BY:	
CHECKED BY: J. Richmond	
DATE: 11/07	APPROVED BY:

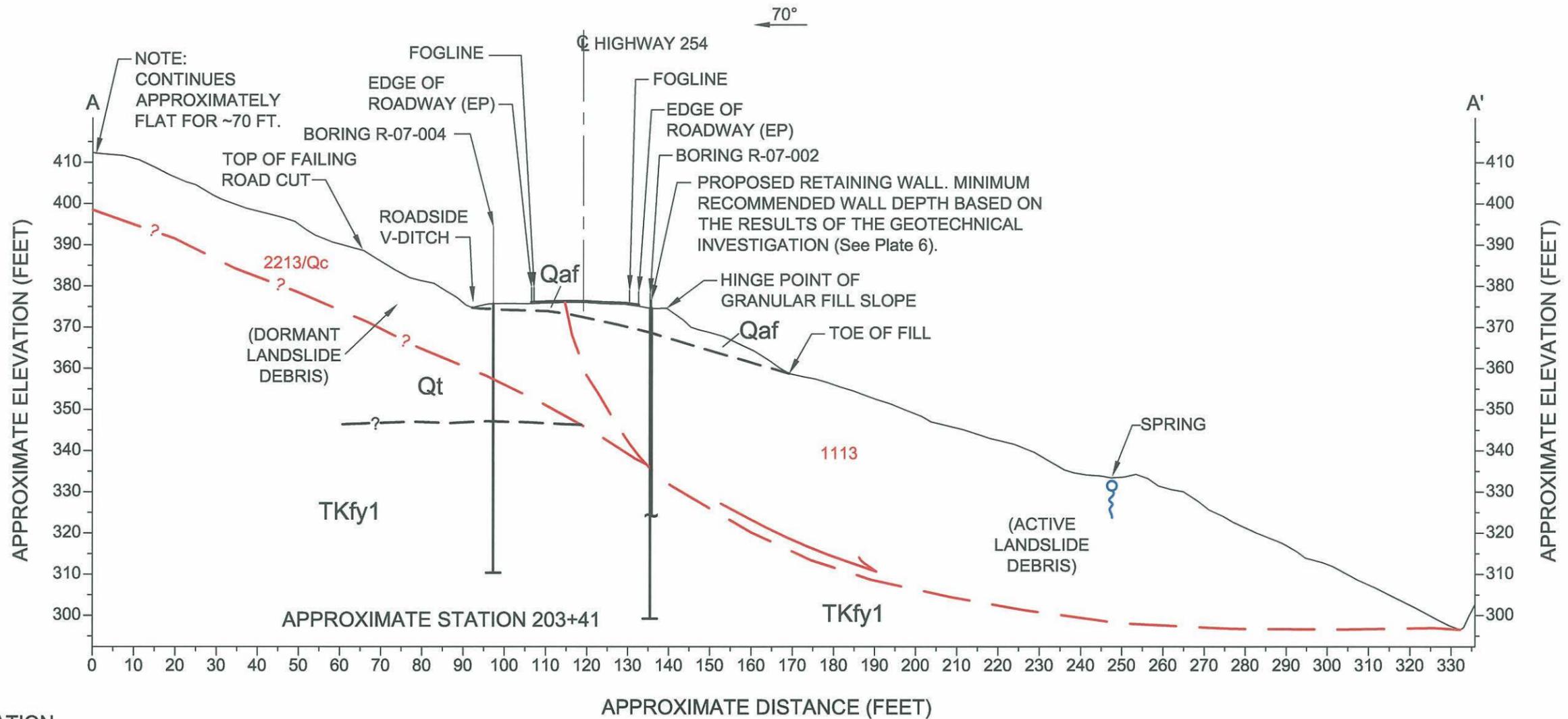
<b>SITE PLAN</b>	
STORM DAMAGE LOCATION EA: 01-475001 HIGHWAY 254 P.M. 5.80 HUMBOLDT COUNTY, CALIFORNIA	
PROJECT NO. 85401-2	FILE NAME: Hum254pm5-80-4.dwg

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PLATE  
**2**

ATTACHED IMAGES: Images: DC\_2503128.jpg  
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**EXPLANATION**

- Qaf** Artificial Fill
- Qc** Colluvium
- Qt** Terrace Deposits
- TKfy1** Franciscan Complex:  
Coastal Belt: Yager Terrace
- 1113** Landslide Identification  
Number (see landslide chart)

Geologic Contact: Dashed  
 Where Approximate



NOTE:  
 SECTION A-A' WAS HAND LEVEL FIELD SURVEYED IN  
 AUGUST 2007 AND MAY DIFFER FROM THE TOPOGRAPHY  
 AND MAPPING AS SHOWN ON THE SITE PLAN, PLATE 2.

<b>SECTION A-A'</b>	
DRAWN BY: P. Hubbard	
REVISED BY:	
CHECKED BY: J. Richmond	STORM DAMAGE LOCATION EA: 01-475001 HIGHWAY 254 P.M. 5.80 HUMBOLDT COUNTY, CALIFORNIA
DATE: 11/07	APPROVED BY:
PROJECT NO. 85401-2	FILE NAME: Hum254pm5-80-5.dwg

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PLATE

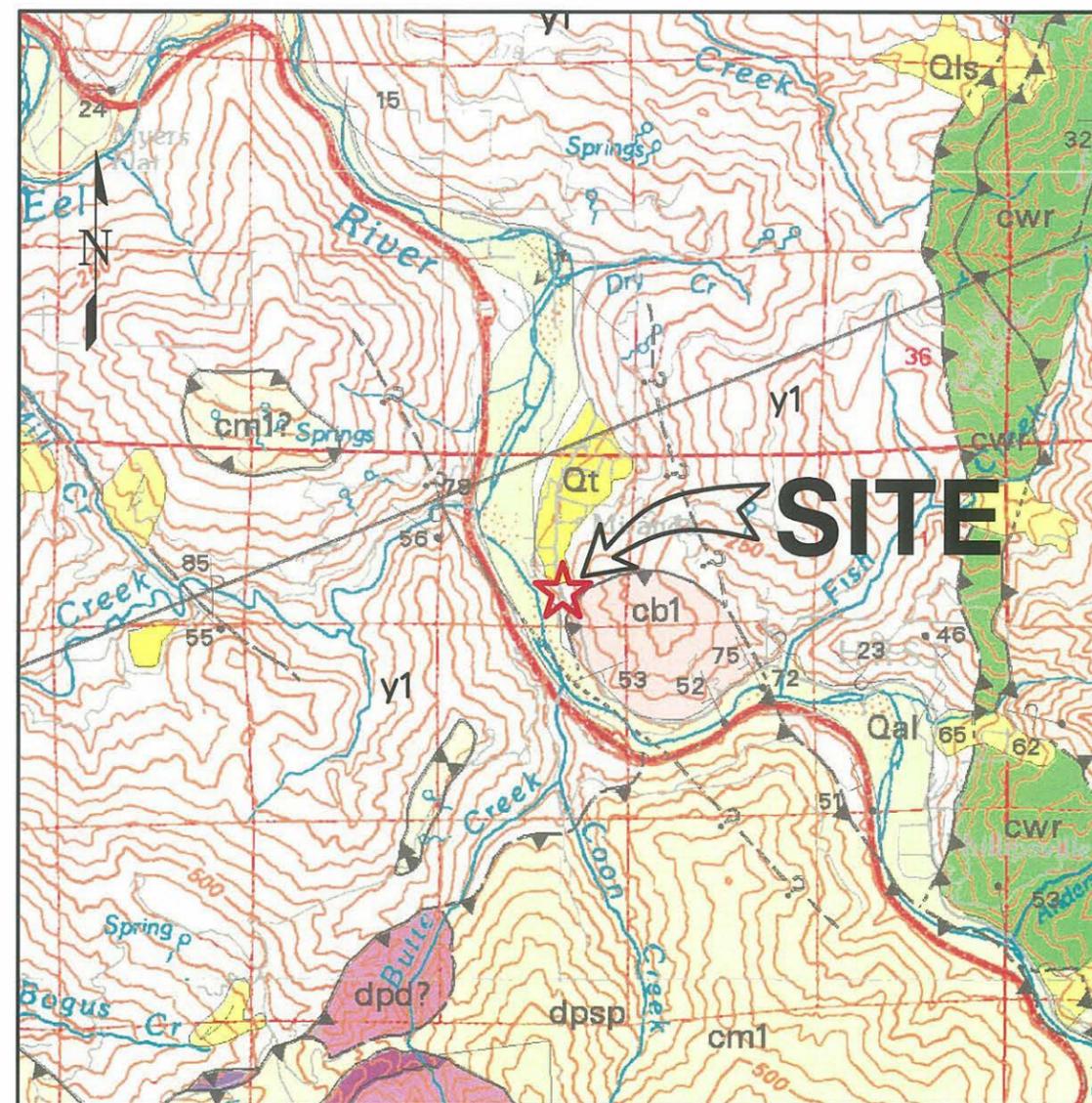
3

## EXPLANATION

### MAP SYMBOLS

- ? Contact-Dashed where approximate, dotted where concealed, queried where uncertain
- - - - -? Fault-Dashed where approximate, dotted where concealed, queried where uncertain
- ▲▲▲▲ Thrust fault-Barbs on 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:**
- 10/20 Inclined-Ball denotes top of beds is known from sedimentary features
- ×/× Vertical-Ball denotes top of beds is known from sedimentary features
- ⊕ Horizontal
- 10/20 Overturned-Ball denotes that top of beds is known from sedimentary features
- 10/20 Approximate-Based on photo interpretation or estimated dip in field
- 10/ Joint-Straight line denotes strike and dip of joint
- 10/ Strike and dip of cleavage-Ball denotes that top of flow is known from sedimentary or volcanic features
- Shear foliation:**
- 10/ Inclined
- Vertical
- Folds:**
- ← Synclinal or synformal axis-showing direction of plunge
- ← Anticlinal or antiformal axis-showing direction of plunge
- ↑ Overturned syncline
- Landslide-Arrows indicate direction of movement
- Melange Blocks:**
- △ Serpentinite
- Chert
- ◇ Blueschist
- Greenstone
- Fossil locality and number

- Qal Alluvial deposits (Holocene and late Pleistocene)-Clay, silt, sand, gravel, and boulders, deposited in stream beds, alluvial fans, terraces, flood plains and ponds; and soils formed on these deposits. Includes largely Holocene deposits in modern stream channels and on flood plains
- Qt Undifferentiated nonmarine terrace deposits (Holocene and Pleistocene)-Dissected and (or) uplifted gravel, sand, silt, and clay, deposited in fluvial settings. In western Eureka quadrangle (Sheet 1) unit includes minor shallow marine intertongues and warped and tilted beds of late Pleistocene Hookton and Rohnerville Formations of Ogle (1953), in addition to younger late Pleistocene and Holocene fluvial terrace units a few feet to a few tens of feet higher than normal modern high-water level
- y1 Sheared and highly folded mudstone-Includes minor rhythmically interbedded sandstone, locally with lenses of conglomerate. Exhibits irregular topography lacking a well-incised system of sidehill drainages
- cm1 Melange-Predominantly penetratively sheared, locally tuffaceous, scaly meta-argillite and less abundant blocks of metasediment. Exhibits rounded, poorly incised, lumpy and irregular topography
- cb1 Broken formation-Consists of bedded to massive, locally folded, rarely conglomeratic metasediment and meta-argillite, with only minor amounts of highly sheared rocks. Exhibits sharp-crested topography with regular, well-incised sidehill drainages
- cwr White Rock metasediment of Jayko and others (1989) (Paleogene and (or) Late Cretaceous)-Arkosic metasediment and minor meta-argillite, thick bedded to massive, shattered and sheared; commonly extensively veined with laumontite and calcite; metasediment has 1 to 25 percent detrital K-feldspar and prominent detrital biotite. Unit occurs as slabs and blocks up to several kilometers long, mostly along west side of the Central belt. Unit is named for similar metasediment described in the Covelo 1:100,000 quadrangle (Jayko and others, 1989) that contains dinoflagellates of late Cretaceous age. Some blocks of the White Rock metasediment possibly have been tectonically incorporated into the Central belt from the structurally underlying Coastal belt, and thus could be Paleocene or Eocene in age. A carbonate concretion from melange adjacent to the White Rock metasediment along the western side of the Central belt in the Covelo quadrangle was found to contain Paleocene dinoflagellates (A. Jayko, oral commun., 1993)
- dpb Basaltic flows and keratophytic tuff (Jurassic?)-Uralitic and intruded locally by mylonitic quartz keratophyre dike rocks, present locally along west boundary of Central belt of Franciscan Complex near Benbow (Sheet 3)
- dpd Diabase (Jurassic?)-Dikes and sills, fine to coarse grained, with ophiolitic texture, present below basalt flows near Benbow and forms Bear Buttes north of Garberville (Sheet 3). Lower part of diabase unit of Bear Buttes locally includes minor cumulate gabbro. Lower diabase contact considered to be an attenuation fault
- dpsp Serpentinite melange (Jurassic?)-Partially to completely serpentinized ultramafic rocks (harzburgite, dunite), locally highly sheared, and includes minor masses of cumulate gabbro, diabase or basalt. Present beneath diabase and (or) basalt of the Benbow and Bear Buttes areas (Sheet 3). Contact with overlying ophiolitic rocks probably is an attenuation fault. Unit is partially equivalent to some serpentinite interspersed with and assigned to Central belt of Franciscan Complex

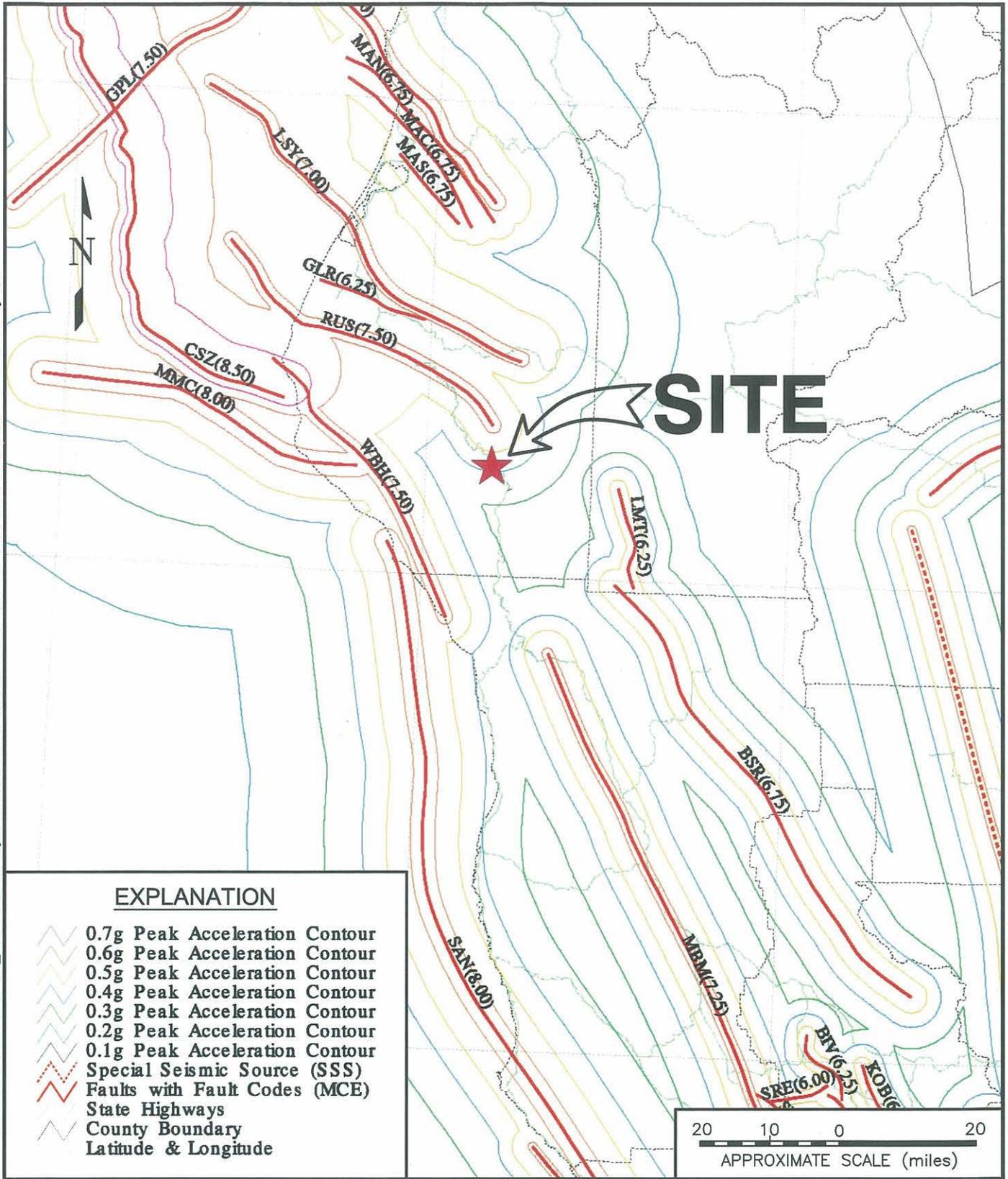


DRAWN BY:	P. Hubbard	<b>REGIONAL GEOLOGY</b>	<b>KLEINFELDER</b>	PLATE	<b>4</b>
REVISOR BY:				2240 Northpoint Parkway Santa Rosa, CA 95407-5009 PH. 707-571-1883 FAX. 707-571-7813 www.kleinfelder.com	
CHECKED BY:	J. Richmond	STORM DAMAGE LOCATION EA: 01-475001 HIGHWAY 254 P.M. 5.80 HUMBOLDT COUNTY, CALIFORNIA			
DATE:	11/07	APPROVED BY:		PROJECT NO.	85401-2
				FILE NAME:	Hum254pm5-80-2.dwg

ATTACHED IMAGES: Geology\_Expln.jpg Images: Hum254pm5-80-Geology.jpg  
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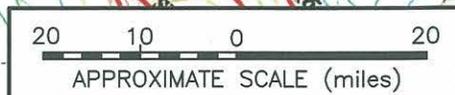
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CAD FILE: U:\GEOTECH\_PROJECTS\Projects\Active\85401 Caltrans HWY 254 PM 5.10, 5.58, 5.8\CAD\ LAYOUT: Layout1



**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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**CALIFORNIA SEISMIC HAZARD MAP (MUALCHIN 1996)**

STORM DAMAGE LOCATION  
 EA: 01-475001  
 HIGHWAY 254 P.M. 5.80  
 HUMBOLDT COUNTY, CALIFORNIA

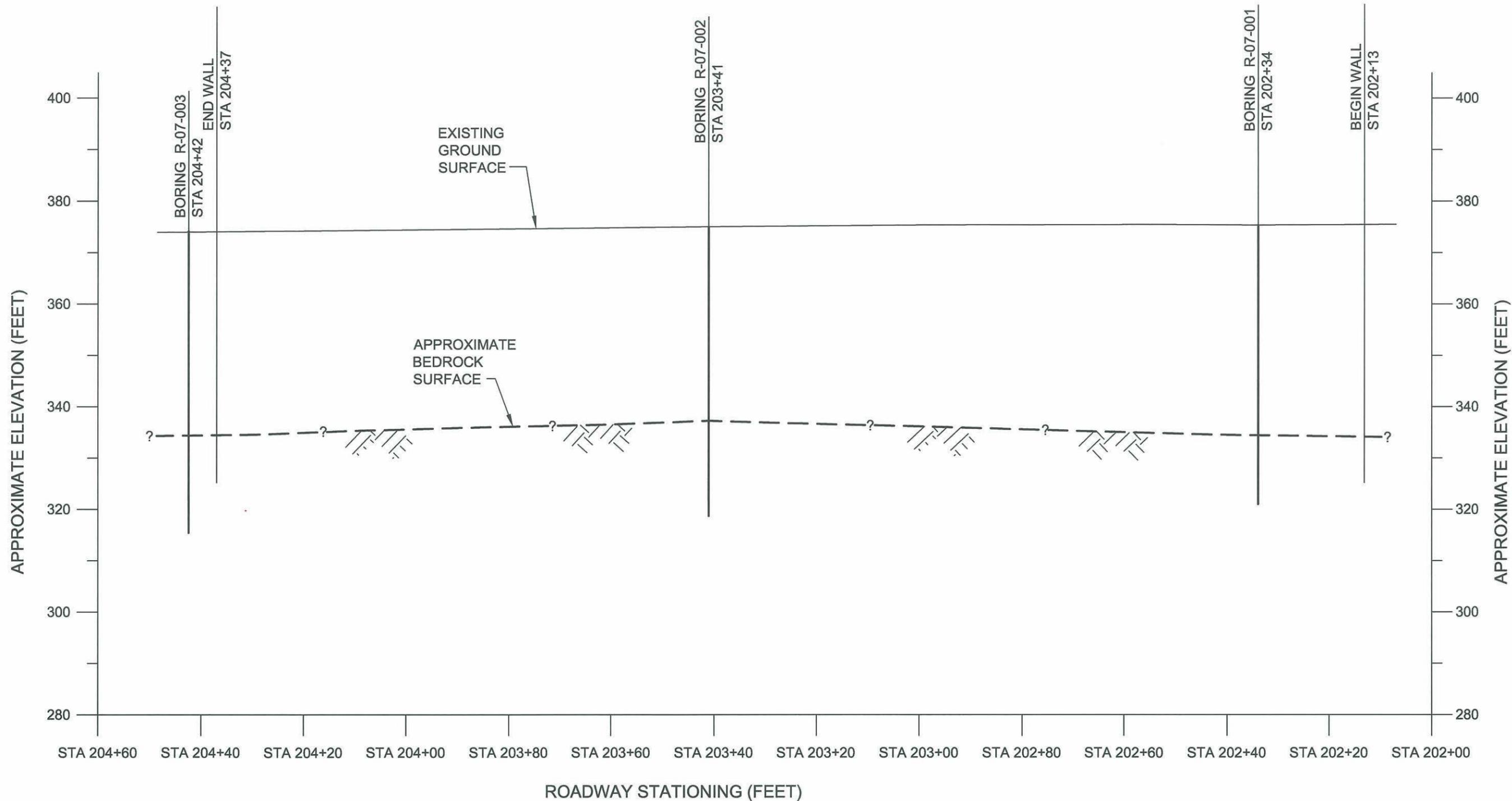
DRAWN BY: P. Hubbard  
 REVISED BY:  
 CHECKED BY: J. Richmond  
 PLATE

**5**

DRAWN: 11/07 APPROVED BY:

PROJECT NO. 85401-2 FILE NAME Hum254pm5-80-3.dwg

ATTACHED IMAGES: Images: DC\_2503301.jpg  
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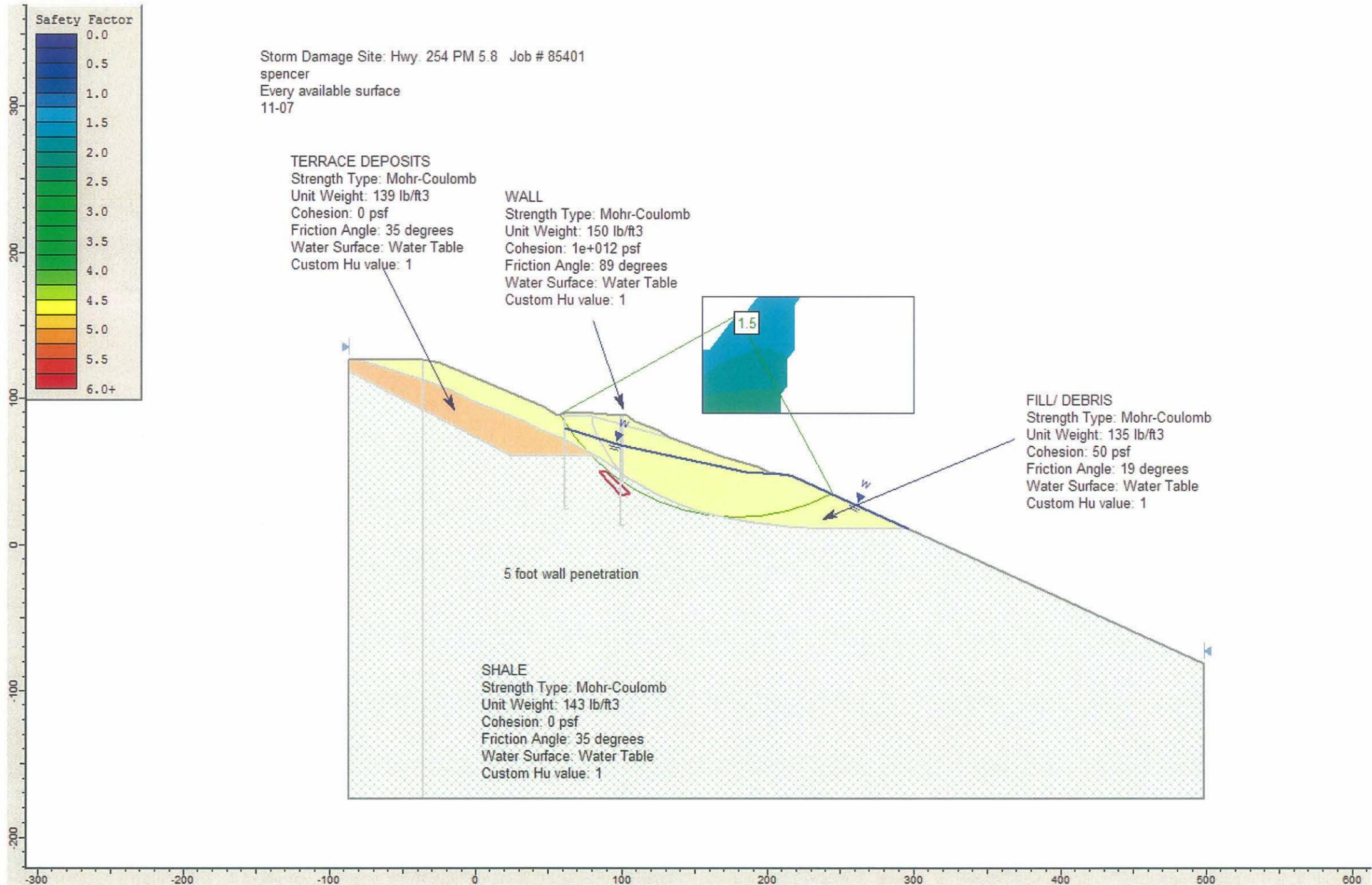
**NOTE:**  
 The depth of bedrock indicated on this plate was generalized by interpolation and extrapolation between widely spaced borings. Information on bedrock depth exists only at the specific boring locations, which are offset from the proposed wall location. Bedrock depths shown should be considered approximate and variations should be expected.



DRAWN BY: P. Hubbard		<b>APPROXIMATE BEDROCK PROFILE ALONG WALL</b>	<b>KLEINFELDER</b>	PLATE <b>6</b>
REVISED BY:				
CHECKED BY: J. Richmond		STORM DAMAGE SITE EA: 01-475001 HIGHWAY 254 PM 5.80 HUMBOLDT COUNTY, CALIFORNIA	2240 Northpoint Parkway Santa Rosa, CA 95407-5009 PH. 707-571-1883 FAX. 707-571-7813 www.kleinfelder.com	
DATE: 11/07	APPROVED BY: 			

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PLOTTED: 29 Nov 2007, 10:16am, phubbard



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 Santa Rosa, California 95407  
 Ph. (707) 571-1883 Fax. (707) 571-7813

**Slope Stability Analysis: Storm Damage Location**

**Highway 254 PM 5.8 EA # 475001**

**Humboldt, California**

**PLATE**

**7**

Compiled by: C. Goitein

Date: November 2007

Reviewed by: T. Craven

Revision date:

PROJECT NO.: 85401

GROUP SYMBOLS AND NAMES			
Graphic / Symbol	Group Names	Graphic / Symbol	Group Names
	Well-graded GRAVEL		Lean CLAY
	Well-graded GRAVEL with SAND		Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY
	Poorly graded GRAVEL		SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
	Poorly graded GRAVEL with SAND		SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY
	Well-graded GRAVEL with SILT		SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
	Well-graded GRAVEL with SILT and SAND		SILT SILT with SAND SILT with GRAVEL SANDY SILT
	Well-graded GRAVEL with CLAY (or SILTY CLAY)		SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
	Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
	Poorly graded GRAVEL with SILT		ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT
	Poorly graded GRAVEL with SILT and SAND		SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
	Poorly graded GRAVEL with CLAY (or SILTY CLAY)		Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY
	Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
	SILTY GRAVEL		Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT
	SILTY GRAVEL with SAND		SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
	CLAYEY GRAVEL		ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
	CLAYEY GRAVEL with SAND		ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT
	SILTY, CLAYEY GRAVEL		SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
	SILTY, CLAYEY GRAVEL with SAND		ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	Well-graded SAND		ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	Well-graded SAND with GRAVEL		COBBLES COBBLES and BOULDERS BOULDERS
	Poorly graded SAND		
	Poorly graded SAND with GRAVEL		
	Well-graded SAND with SILT		
	Well-graded SAND with SILT and GRAVEL		
	Well-graded SAND with CLAY (or SILTY CLAY)		
	Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)		
	Poorly graded SAND with SILT		
	Poorly graded SAND with SILT and GRAVEL		
	Poorly graded SAND with CLAY (or SILTY CLAY)		
	Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)		
	SILTY SAND		
	SILTY SAND with GRAVEL		
	CLAYEY SAND		
	CLAYEY SAND with GRAVEL		
	SILTY, CLAYEY SAND		
	SILTY, CLAYEY SAND with GRAVEL		
	PEAT		

FIELD AND LABORATORY TESTS	
<b>C</b>	Consolidation (ASTM D 2435-04)
<b>CL</b>	Collapse Potential (ASTM D 5333-03)
<b>CP</b>	Compaction Curve (CTM 216 - 06)
<b>CR</b>	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
<b>CU</b>	Consolidated Undrained Triaxial (ASTM D 4767-02)
<b>DS</b>	Direct Shear (ASTM D 3080-04)
<b>EI</b>	Expansion Index (ASTM D 4829-03)
<b>M</b>	Moisture Content (ASTM D 2216-05)
<b>OC</b>	Organic Content (ASTM D 2974-07)
<b>P</b>	Permeability (CTM 220 - 05)
<b>PA</b>	Particle Size Analysis (ASTM D 422-63 [2002])
<b>PI</b>	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
<b>PL</b>	Point Load Index (ASTM D 5731-05)
<b>PM</b>	Pressure Meter
<b>PP</b>	Pocket Penetrometer
<b>R</b>	R-Value (CTM 301 - 00)
<b>SE</b>	Sand Equivalent (CTM 217 - 99)
<b>SG</b>	Specific Gravity (AASHTO T 100-06)
<b>SL</b>	Shrinkage Limit (ASTM D 427-04)
<b>SW</b>	Swell Potential (ASTM D 4546-03)
<b>TV</b>	Pocket Torvane
<b>UC</b>	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
<b>UU</b>	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
<b>UW</b>	Unit Weight (ASTM D 4767-04)
<b>VS</b>	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS	
	Standard Penetration Test (SPT)
	Standard California Sampler
	Modified California Sampler
	Shelby Tube
	Piston Sampler
	NX Rock Core
	HQ Rock Core
	Bulk Sample
	Other (see remarks)

DRILLING METHOD SYMBOLS			
	Auger Drilling		Rotary Drilling
	Dynamic Cone or Hand Driven		Diamond Core

WATER LEVEL SYMBOLS	
	First Water Level Reading (during drilling)
	Static Water Level Reading (short-term)
	Static Water Level Reading (long-term)



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services  
 Office of Geotechnical Design - North

REPORT TITLE				
BORING RECORD LEGEND				
DIST. 01	COUNTY Humboldt	ROUTE 254	POSTMILE D5.8/D	EA 01-475001
PROJECT OR BRIDGE NAME				
Storm Damage Location: Highway 254 PM 5.8				
BRIDGE NUMBER	PREPARED BY	DATE	SHEET 1 of 3	

**CONSISTENCY OF COHESIVE SOILS**

Descriptor	Unconfined Compressive Strength (tsf)	Pocket Penetrometer (tsf)	Torvane (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

**APPARENT DENSITY OF COHESIONLESS SOILS**

Descriptor	SPT N <sub>60</sub> - Value (blows / foot)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

**MOISTURE**

Descriptor	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**

Descriptor	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%

**SOIL PARTICLE SIZE**

Descriptor	Size	
Boulder	> 12 inches	
Cobble	3 to 12 inches	
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay	Passing No. 200 Sieve	

**PLASTICITY OF FINE-GRAINED SOILS**

Descriptor	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; it cannot be rerolled 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 rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

**CEMENTATION**

Descriptor	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.

**NOTE:** This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (July 2007), Section 2, for tables of additional soil description components and discussion of soil description and identification.



Department of Transportation  
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 Office of Geotechnical Design - North

REPORT TITLE

**BORING RECORD LEGEND**

DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>
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PROJECT OR BRIDGE NAME  
**Storm Damage Location: Highway 254 PM 5.8**

BRIDGE NUMBER	PREPARED BY	DATE	SHEET <b>2 of 3</b>
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ROCK GRAPHIC SYMBOLS	
	IGNEOUS ROCK
	SEDIMENTARY ROCK
	METAMORPHIC ROCK

BEDDING SPACING	
Descriptor	Thickness or Spacing
Massive	> 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8 inches to 1 ft
Thinly bedded	1-1/4 to 3-5/8 inches
Very thinly bedded	3/8 inch to 1-1/4 inches
Laminated	< 3/8 inch

WEATHERING DESCRIPTORS FOR INTACT ROCK						
Descriptor	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering and Grain Boundary Conditions	Texture and Solutioning		
	Body of Rock	Fracture Surfaces		Texture	Solutioning	
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No solutioning	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 (refer to grain boundary conditions)	All fracture surfaces are discolored or oxidized; surfaces are friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Altered by chemical disintegration such as via hydration or 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 hairline 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".

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

RELATIVE STRENGTH OF INTACT ROCK	
Descriptor	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

ROCK HARDNESS	
Descriptor	Criteria
Extremely Hard	Specimen cannot be scratched with pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows
Very hard	Specimen cannot be scratched with pocket knife or sharp pick; breaks with repeated heavy hammer blows
Hard	Specimen can be scratched with pocket knife or sharp pick with 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; breaks with moderate hammer blows
Moderately Soft	Specimen can be grooved 1/6 in. with pocket knife or sharp pick with moderate or heavy pressure; breaks with light hammer blow or heavy hand pressure
Soft	Specimen can be grooved or gouged with pocket knife or sharp pick with light pressure, breaks with light to moderate hand pressure
Very Soft	Specimen can be readily indented, grooved, or gouged with fingernail, or carved with pocket knife; breaks with light hand pressure

**CORE RECOVERY CALCULATION (%)**

$$\frac{\sum \text{Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

**RQD CALCULATION (%)**

$$\frac{\sum \text{Length of intact core pieces > 4 in.}}{\text{Total length of core run (in.)}} \times 100$$

FRACTURE DENSITY	
Descriptor	Criteria
Unfractured	No fractures
Very Slightly Fractured	Lengths greater 3 ft
Slightly Fractured	Lengths from 1 to 3 ft, few lengths outside that range
Moderately Fractured	Lengths mostly in range of 4 in. to 1 ft, with most lengths about 8 in.
Intensely Fractured	Lengths average from 1 in. to 4 in. with scattered fragmented intervals with lengths less than 4 in.
Very Intensely Fractured	Mostly chips and fragments with few scattered short core lengths



Department of Transportation  
 Division of Engineering Services  
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 Office of Geotechnical Design - North

REPORT TITLE				
BORING RECORD LEGEND				
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>				
BRIDGE NUMBER	PREPARED BY	DATE	SHEET <b>3 of 3</b>	

LOGGED BY <b>C. Goitein</b>	BEGIN DATE <b>8-22-07</b>	COMPLETION DATE <b>8-23-07</b>	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID <b>R-07-001</b>
DRILLING CONTRACTOR <b>Caltrans</b>	BOREHOLE LOCATION (Station, Offset, Line) <b>Offset 14L 202+34</b>		SURFACE ELEVATION <b>376+- ft</b>	
DRILLING METHOD <b>Rotary Wash</b>	DRILL RIG <b>Mobile B47</b>		BOREHOLE DIAMETER <b>4.5 in.</b>	
SAMPLER TYPE(S) AND SIZE(S) (ID) <b>Modified California, SPT, Coring</b>	SPT HAMMER TYPE <b>Safety semi-automatic, 140 lb, 30-inch drop</b>		HAMMER EFFICIENCY, ERI	
BOREHOLE BACKFILL AND COMPLETION <b>Cement Grout</b>	GROUNDWATER DURING DRILLING READINGS		AFTER DRILLING (DATE) <b>75.0 ft</b>	

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
0	0		ASPHALT: 1.1 ft. thick.												Begin Punch Core
1	1		SILTY SAND with GRAVEL (SM); loose to medium dense; light brown; dry; little subangular to subrounded GRAVEL [FILL]. SANDY lean CLAY (CL); hard; light brown; dry; few angular GRAVEL; little fine to medium SAND [FILL]. Becomes moist @ 3 ft.		1			100							
2	2				C1	15	28	61		18	106				
3	3				2	14									
4	4		GRAVELLY fat CLAY (CH); hard; yellowish brown; moist; little fine, angular GRAVEL; little fine to coarse SAND; [LANDSLIDE DEBRIS].		3	14									
5	5														
6	6				4	13	23	43							
7	7		SANDY fat CLAY (CH); very stiff to hard; olive brown; moist; little fine to coarse SAND; with sandstone fragments; [LANDSLIDE DEBRIS]. Charcoal fragments @ 12.5 ft.		5	13									
8	8									18	102				
9	9				6	10									
10	10		Some crushed sandstone fragments @ 16 ft.		C2										
11	11														
12	12				7	8	18	67			15	114			PI
13	13		2 in. sandstone cobble fragment.		8	10									
14	14														
15	15				9	9	19	37							
16	16		CLAYEY SAND with GRAVEL (SC); medium dense; bluish gray; moist; sandstone fragments; [LANDSLIDE		C4	8									
17	17														
18	18				9	14	29	43			21	111			No Recovery re-sampled with SPT
19	19				10	10									
20	20														
21	21														
22	22														
23	23														
24	24														
25	25														Drilling Refusal with 800 psi down pressure, use drill head from 23.5 to 26 ft.

(continued)

CALTRANS BORING RECORD 052007 HUM 254 PM 5.8.GPJ CT SACTO 053107.GDT 11/19/07



Department of Transportation  
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Geotechnical Services  
Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-001</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>R. Padgett/ C. Goitein</b>		DATE <b>8-27-07</b>	SHEET <b>1 of 3</b>

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
25			DEBRIS.												
26			CLAYEY SAND with GRAVEL (SC) (continued).												
27					12	8	19	58	0	15					
28						8									
29						11									
30					C6										
31															
32					13	5	24	20	0						
33						9									
34						15									
35					C7										
36															
37					C8	6	22	53	0						
38						9									
39						13									
40															
41															
42			SEDIMENTARY ROCK (Shale with Sandstone Interbeds), dark gray, decomposed, very soft, very intensely fractured.		C9	19	77	60	0						
43						27									
44						50									
45					C10			72	0						Tight drilling, Switch to Coring: HWD3 Stratapax bit @ 43.5 ft.
46			Sandstone Interbed, thinly bedded, 3.5 in., with calcite healed fractures @ 46.5 ft.		C11			90	0	128	UU =2.3				
47															
48															
49															
50															
51			Sandstone Interbed, moderately bedded, 10 in., with calcite healed fractures @ 51 ft.		C12			87	0						
52															
53															
54															
55															

(continued)



Department of Transportation  
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 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-001</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>R. Padgett/ C. Goitein</b>		DATE <b>8-27-07</b>	SHEET <b>2 of 3</b>

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
55			SEDIMENTARY ROCK (Shale with Sandstone Interbeds) <i>(continued)</i> .	C13			72	0							
56															
57															
58															
59															
60			Becomes soft.	C14		31		63	0						
61						50/3.5									
62			Sandstone Interbed, moderately bedded, 7 in., with calcite healed fractures @ 62 ft.												
63															
64															
65				C15				100	0						
66															
67															
68				C16				93	0						
69															
70				C17				100	0						
71															
72															
73				C18				100	0						
74															
75			Bottom of Borehole at 75.0 ft.												
76															
77															
78															
79															
80															
81															
82															
83															
84															
85															



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services  
 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-001</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>R. Padgett/ C. Goitein</b>		DATE <b>8-27-07</b>	SHEET <b>3 of 3</b>

LOGGED BY <b>J. Walker</b>	BEGIN DATE <b>8-21-07</b>	COMPLETION DATE <b>8-22-07</b>	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID <b>R-07-002</b>
DRILLING CONTRACTOR <b>Woodward</b>	BOREHOLE LOCATION (Station, Offset, Line) <b>Offset 15L 203+41</b>		SURFACE ELEVATION <b>376 ft</b>	
DRILLING METHOD <b>Rotary Wash</b>	DRILL RIG <b>Mible B57</b>		BOREHOLE DIAMETER <b>4.5 in.</b>	
SAMPLER TYPE(S) AND SIZE(S) (ID) <b>Modified California, SPT, Coring</b>	SPT HAMMER TYPE <b>Safety semi-automatic, 140 lb, 30-inch drop</b>		HAMMER EFFICIENCY, ERI	
BOREHOLE BACKFILL AND COMPLETION	GROUNDWATER READINGS	DURING DRILLING	AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING <b>75.0 ft</b>

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
0	0		SILTY GRAVEL (GM); loose; gray brown; dry [FILL].												
374.00	2		Poorly graded GRAVEL (GP); dense; dark brown; moist; fine to coarse GRAVEL [FILL].												
372.00	4														
370.00	6		GRAVELLY fat CLAY (CH); medium stiff to stiff; olive brown; moist; little GRAVEL; [LANDSLIDE DEBRIS].												
368.00	8														
366.00	10														
364.00	12														
362.00	14														
360.00	16														
358.00	18														
356.00	20														
354.00	22														
352.00	24		Becomes grayish blue.												

(continued)



Department of Transportation  
Division of Engineering Services  
Geotechnical Services  
Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-002</b>
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>				
BRIDGE NUMBER	PREPARED BY <b>C. Goitein</b>	DATE <b>8-27-07</b>	SHEET <b>1 of 3</b>	

CALTRANS BORING RECORD 052007 HUM 254 PM 5.8.GPJ CT SACTO 053107.GDT 11/19/07

CALTRANS BORING RECORD 052007 HUM 254 PM 5.8.GPJ CT SACTO 053107.GDT 11/19/07

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks	
350.00	25	[Material Graphics: Diagonal Hatching]	GRAVELLY fat CLAY (CH) <i>(continued)</i> .		5	10	23									
	26					6	13				13	128	UU =0.7			
	27															
348.00	28															
	29															
346.00	30															
	31						4	6	20							
	32					7	14					12	125			
344.00	33					C1				0						Switch to Coring with HQ # 8 impreg bit
	34															
342.00	35															
	36				8	6	26	10								
340.00	37				11	15										
	38			C2												
338.00	39		SEDIMENTARY ROCK (Shale), grayish blue, decomposed, very soft, very intensely fractured.													
	40				9	10		0								
336.00	41				50/3											
	42			C3												
334.00	43			C4				0								
	44															
332.00	45															
	46															
330.00	47															
	48															
328.00	49			C5				0								
	50															
326.00	51													Switched to HQ stepped carbide bit, 15 ft. caved, drilled advanced casing to 57 ft.		
	52															
324.00	53															
	54															
322.00	55															

(continued)



Department of Transportation  
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 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-002</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>C. Goitein</b>		DATE <b>8-27-07</b>	SHEET <b>2 of 3</b>

CALTRANS BORING RECORD 052007 HUM 254 PM 5.8.GPJ CT SACTO 053107.GDT 11/19/07

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
55			SEDIMENTARY ROCK (Shale) <i>(continued)</i> .												
320.00	56														
	57														
318.00	58		SEDIMENTARY ROCK (Shale), grayish blue, intensely weathered, soft, intensely fractured, calcite healed fractures.		C6			28							
	59														
316.00	60		SEDIMENTARY ROCK (Shale), grayish blue, intensely weathered, soft, intensely fractured, calcite healed fractures.		C7			97	0						
	61														
314.00	62		Joint, dipping 70°.												
	63														
312.00	64		Joint, dipping 50°.												
	65														
310.00	66				C8			10	0						
	67														
308.00	68														
	69														
306.00	70				C9			0							
	71														
304.00	72														
	73														
302.00	74														
	75														
300.00	76		Bottom of Borehole at 75.0 ft. Slope Inclinometer was installed												
	77														
298.00	78														
	79														
296.00	80														
	81														
294.00	82														
	83														
292.00	84														
	85														



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services  
 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-002</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>C. Goitein</b>		DATE <b>8-27-07</b>	SHEET <b>3 of 3</b>

LOGGED BY <b>C. Goitein</b>	BEGIN DATE <b>8-21-07</b>	COMPLETION DATE <b>8-21-07</b>	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID <b>R-07-003</b>
DRILLING CONTRACTOR <b>Caltrans</b>	BOREHOLE LOCATION (Station, Offset, Line) <b>Offset 22L 204+42</b>		SURFACE ELEVATION <b>375 ft</b>	
DRILLING METHOD <b>Rotary Wash</b>	DRILL RIG <b>Mobile B47</b>		BOREHOLE DIAMETER <b>4.5 in.</b>	
SAMPLER TYPE(S) AND SIZE(S) (ID) <b>Modified California, SPT, Coring</b>	SPT HAMMER TYPE <b>Safety semi-automatic, 140 lb, 30-inch drop</b>		HAMMER EFFICIENCY, ERI	
BOREHOLE BACKFILL AND COMPLETION <b>Cement Grout</b>	GROUNDWATER READINGS	DURING DRILLING	AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING <b>75.0 ft</b>

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
0	0		CLAYEY SAND with GRAVEL (SC); medium dense; light brown; dry; little fine, angular GRAVEL; some fine to coarse SAND [FILL].												Begin Punch Core
373.00	1														
	2														
	3														
371.00	4			C1	11	37	67								
	5			1	14										
	6			2	23										
369.00	7		SANDY lean to fat CLAY with GRAVEL (CL/CH); hard; light brown; dry to moist; few fine, subrounded GRAVEL; few fine to medium SAND; minor rootlets, [LANDSLIDE DEBRIS].							16	100				
	8														
367.00	9		Cobble @ 9 ft.	C2											Punch core refusal, use drill head from 9 to 11 ft.
365.00	10														
	11														
363.00	12		SANDY lean to fat CLAY (CL/CH); stiff to very stiff; mottled olive brown; moist; little fine to coarse SAND; some charcoal, [LANDSLIDE DEBRIS].	C3	6	17	28								PI
	13			6	7										
	14			7	10					23	101				
361.00	15		CLAYEY SAND with GRAVEL (SC/GC); medium dense; olive brown; moist; [LANDSLIDE DEBRIS].												
	16														
359.00	17		SANDY fat CLAY with GRAVEL (CH); very stiff; olive brown; moist; trace fine GRAVEL; little medium to coarse SAND; [LANDSLIDE DEBRIS].	C4	5	18	40								
	18		CLAYEY SAND with GRAVEL (SC/GC); medium dense; olive brown; moist; [LANDSLIDE DEBRIS].	8	8										
357.00	19		Alternating layers of Sandy Clay with Gravel and Clayey Sand/ Clayey Gravel; [LANDSLIDE DEBRIS].												
	20														
355.00	21														
	22			C5	9	21	40								
353.00	23		CLAYEY GRAVEL with SAND (GC); medium dense; olive brown; moist; little fine to coarse SAND; some fines; fine to coarse, angular to rounded GRAVEL, [LANDSLIDE DEBRIS].												
	24														
351.00	25														

(continued)

CALTRANS BORING RECORD 052007 HUM 254 PM 5.8.GPJ CT SACTO 053107.GDT 11/19/07



Department of Transportation  
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 Geotechnical Services  
 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-003</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>C. Goitein</b>		DATE <b>8-27-07</b>	SHEET <b>1 of 3</b>

CALTRANS BORING RECORD 052007 HUM 254 PM 5.8.GPJ CT SACTO 053107.GDT 11/19/07

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
349.00	25		CLAYEY GRAVEL with SAND (GC) (continued).		C5			40							
347.00	26		SANDY lean to fat CLAY with GRAVEL (CH/CL); very stiff; olive gray; moist; little medium to coarse SAND; [LANDSLIDE DEBRIS].		C6	10	33	20							No Recovery in sample, run SPT down @ 26 ft.
	27	15													
	28	18													
345.00	29		Sandstone layer @ 31 ft.												
343.00	30														
341.00	31		Fat CLAY with SAND (CH); medium stiff to stiff; grayish blue; moist; few medium SAND; shale fragments; [LANDSLIDE DEBRIS].		C7	5	23	60							
	32	9													
	33	14													
339.00	34		Becomes mottled grayish blue to olive gray, stiff.		9	5	15	15			120				
	35	7													
	36	8													
337.00	37		CLAYEY SAND (SC); medium dense to dense; mottled grayish blue to olive gray; moist; coarse, angular to subangular SAND; some fines [DECOMPOSED BEDROCK].		C8										
335.00	38														
333.00	39														
331.00	40		SEDIMENTARY ROCK (Shale), medium bluish gray, decomposed, very soft, very intensely fractured, some calcite infill, argillitic.		10	12	31	63	0						
	41	13													
	42	18													
329.00	43		SEDIMENTARY ROCK (Shale), dark gray, decomposed, very soft, very intensely fractured, some calcite infill, argillitic.		C9										
	44														
	45														
327.00	46		SEDIMENTARY ROCK (Shale), dark gray, decomposed, very soft, very intensely fractured, some calcite infill, argillitic.		11	13	26	35	0						Switch to coring with HQ # 8 diamond impreg bit @ 46 ft.
	47	50/5													
	48														
325.00	49		SEDIMENTARY ROCK (Shale), dark gray, decomposed, very soft, very intensely fractured, some calcite infill, argillitic.		C10										
	50														
	51														
323.00	52		SEDIMENTARY ROCK (Shale), dark gray, decomposed, very soft, very intensely fractured, some calcite infill, argillitic.		12	12	36	40	0						
	53	16													
	54	20													
321.00	55				C11										

(continued)



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services  
 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-003</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>C. Goitein</b>		DATE <b>8-27-07</b>	SHEET <b>2 of 3</b>

CALTRANS BORING RECORD 052007 HUM 254 PM 5.8.GPJ CT SACTO 053107.GDT 11/19/07

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks	
319.00	56		SEDIMENTARY ROCK (Shale) (continued).	C12				33	0							
317.00	58			C13				0								
315.00	60			C14				67	0						Switch to HWD3 Stratapax bit @ 60 ft.	
313.00	62			C15				100	0							
311.00	64			C16				71	0							
309.00	66			C17				100	0							
307.00	68			C18				80	0							
305.00	70			C19				80	0							
303.00	72															
301.00	74															
299.00	76			Bottom of Borehole at 75.0 ft.												Hole caved to 45 ft. when rods were pulled
297.00	78															
295.00	80															
293.00	82															
291.00	84															
	85															



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services  
 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-003</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>C. Goitein</b>		DATE <b>8-27-07</b>	SHEET <b>3 of 3</b>

LOGGED BY <b>J. Richmond</b>	BEGIN DATE <b>8-23-07</b>	COMPLETION DATE <b>8-23-07</b>	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID <b>R-07-004</b>
DRILLING CONTRACTOR <b>Woodward</b>			BOREHOLE LOCATION (Station, Offset, Line) <b>Offset 21R 203+43</b>	SURFACE ELEVATION <b>376 ft</b>
DRILLING METHOD <b>Rotary Wash</b>			DRILL RIG <b>Mible B57</b>	BOREHOLE DIAMETER <b>4.5 in.</b>
SAMPLER TYPE(S) AND SIZE(S) (ID) <b>Modified California, SPT, Coring</b>			SPT HAMMER TYPE <b>Safety semi-automatic, 140 lb, 30-inch drop</b>	HAMMER EFFICIENCY, ERI
BOREHOLE BACKFILL AND COMPLETION <b>Cement Grout</b>			GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) READINGS	TOTAL DEPTH OF BORING <b>65.0 ft</b>

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
0	1		SILTY GRAVEL with SAND (GM); loose; brown and light gray; dry; mostly fine, subangular GRAVEL, max. 0.75 in. dia.; little fine SAND; [AGGREGATE BASE FILL].												
374.00	2		GRAVELLY lean CLAY with SAND (CL); stiff; olive yellow brown; moist; little fine SAND; subangular shale fragments to 1 in. dia.; [LANDSLIDE DEBRIS].												
372.00	3														
370.00	4														
	5														
	6				1	7	30	78							
	7				2	12									
	8														
368.00	9				3	14	42	78							
	10					19				17	114				-200 = 53 %
	11					23									
366.00	12		Increased sand and gravel content @ 12 ft.												
	13														
	14														
	15														
	16		Horizontal direction, possible failure plane @ 16 ft.												
	17														
	18														
358.00	19		CLAYEY SAND (SC); medium dense; red yellow brown; moist; mostly fine to medium SAND; [TERRACE DEPOSITS].												
	20														
	21														
	22		CLAYEY SAND (SC); medium dense; gray blue; moist; mostly fine SAND; [TERRACE DEPOSITS].												
	23														
	24		CLAYEY SAND with GRAVEL (SC); dense; gray blue; wet; some coarse, subangular to subrounded GRAVEL.												
352.00	25														Hard drilling @ 24 ft.

(continued)



Department of Transportation  
Division of Engineering Services  
Geotechnical Services  
Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-004</b>
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>				
BRIDGE NUMBER	PREPARED BY <b>C. Goitein</b>	DATE <b>8-28-07</b>	SHEET <b>1 of 3</b>	

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
350.00	25		max. 1.5 in. dia.; mostly fine to coarse SAND; occasional rounded gravel to 0.5 in. dia., [TERRACE DEPOSITS]. CLAYEY SAND with GRAVEL (SC) (continued).	X	11	14	60	61							
					24										
					36										
348.00	28		SEDIMENTARY ROCK (Shale), very thinly bedded, dark gray to black, slightly weathered, soft, very intensely fractured, pervasively sheared, minor clay infill, polished surfaces, calcite veinlets present.	X	13	17									Rod drop @ 28 to 28.5 ft.
					50/6	67									
346.00	30		Occasional fine Sandstone interbeds @ 35.5 to 41 ft.	X	14	28									
					45	69									
					50/4										
340.00	36		Very intensely fractured, bedding joint, dipping 43°, pervasively sheared, minor clay infill, polished surfaces, slakey.	X	15	6									
					22	63									
					50/4										
336.00	40		Very intensely fractured, bedding joint, dipping 43°, pervasively sheared, minor clay infill, polished surfaces, slakey.	X	16	50/5									
					100										
330.00	46		Very intensely fractured, bedding joint, dipping 43°, pervasively sheared, minor clay infill, polished surfaces, slakey.	X		26									
					50/6										
324.00	52		Very intensely fractured, bedding joint, dipping 43°, pervasively sheared, minor clay infill, polished surfaces, slakey.	C1											Switch to coring @ 52 ft.
					50	0									

(continued)



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services  
 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-004</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER			PREPARED BY <b>C. Goitein</b>	DATE <b>8-28-07</b>	SHEET <b>2 of 3</b>

CAL TRANS BORING RECORD 052007 HUM 254 PM 5.8.GPJ CT SACTO 063107.GDT 11/27/07

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
320.00	55		SEDIMENTARY ROCK (Shale) <i>(continued)</i> .	C2				42	0						
	56														
	57		Bedding joint, dipping 40°, laminated.												
318.00	58														
	59														
316.00	60			C3				62	0						
	61														
314.00	62		Bedding joint, dipping 40°, laminated.												
	63														
312.00	64														
	65		Bottom of Borehole at 65.0 ft.												
310.00	66														
	67														
308.00	68														
	69														
306.00	70														
	71														
304.00	72														
	73														
302.00	74														
	75														
300.00	76														
	77														
298.00	78														
	79														
296.00	80														
	81														
294.00	82														
	83														
292.00	84														
	85														



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services  
 Office of Geotechnical Design - North

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>R-07-004</b>	
DIST. <b>01</b>	COUNTY <b>Humboldt</b>	ROUTE <b>254</b>	POSTMILE <b>D5.8/D</b>	EA <b>01-475001</b>	
PROJECT OR BRIDGE NAME <b>Storm Damage Location: Highway 254 PM 5.8</b>					
BRIDGE NUMBER		PREPARED BY <b>C. Goitein</b>		DATE <b>8-28-07</b>	SHEET <b>3 of 3</b>



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	254	5.80		

11-1-07  
 GEOTECHNICAL PROFESSIONAL DATE  
 WILLIAM V. McCORMICK III  
 No. 1673  
 Exp. 11-30-08  
 REGISTERED GEOLOGIST  
 CERTIFIED ENGINEERING GEOLOGIST  
 STATE OF CALIFORNIA

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

**LEGEND OF BORING OPERATIONS**

**1 1/2" CONE PENETROMETER BORING**  
 B-No. [ ] Location [ ]  
 Top Hole El. [ ]  
 Pressure measured on element (150 psi cone) measured on 1 1/2" element.  
 Friction ratio (s) 0 100 200  
 Tip bearing (125)

**2 1/4" CONE PENETROMETER BORING**  
 B-No. [ ] Location [ ]  
 Top Hole El. [ ]  
 No count recorded - Pumped  
 Driving rate in second last 15 ft of core (15 ft or as noted)  
 Back blow - 100 or as noted

**ROTARY SAMPLE BORING (WET)**  
 B-No. [ ] Location [ ]  
 Top Hole El. [ ]  
 Description of material  
 Unit weight (lb/cu ft)  
 Moisture content (%)  
 Cone penetration test  
 Confined material change  
 Estimated material change  
 Unconfined material change  
 Vane shear  
 Boring Date [ ]

**SAMPLE BORING (DRY)**  
 B-No. [ ] Location [ ]  
 Top Hole El. [ ]  
 Blows per foot (12" Free fall)  
 Pulver Pipe  
 Refusal  
 Boring Date [ ]

**ELECTRONIC CONE PENETROMETER**  
 B-No. [ ] Location [ ]  
 Top Hole El. [ ]  
 Boring Date [ ]

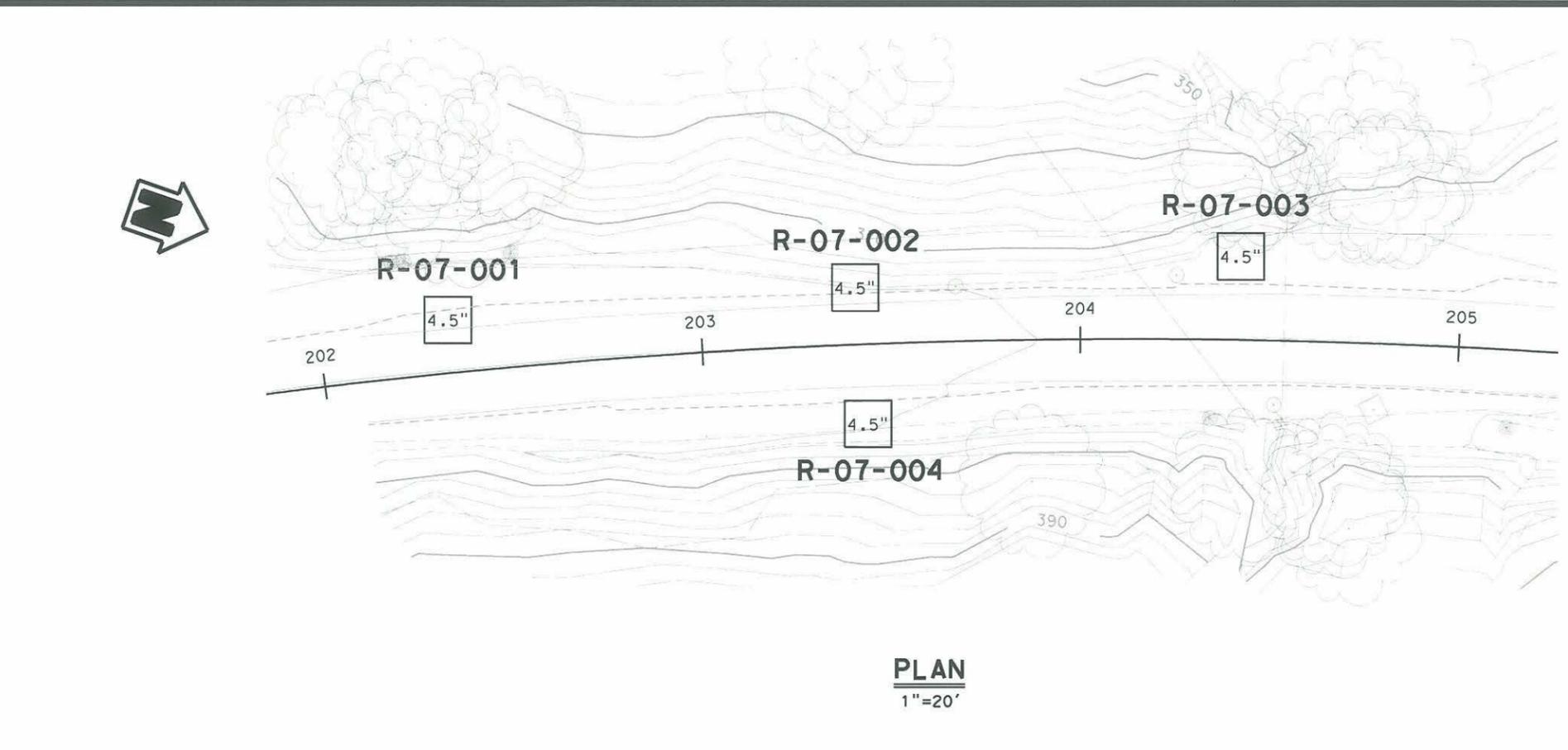
**LEGEND OF EARTH MATERIALS**

GRAVEL  
 SAND  
 SILT  
 CLAY  
 SANDY CLAY or CLAYEY SAND  
 SANDY SILT or SILTY SAND  
 SILTY CLAY  
 CLAYEY SILT  
 PEAT or/or ORGANIC MATERIAL  
 FILL MATERIAL  
 IGNEOUS ROCK  
 SEDIMENTARY ROCK  
 METAMORPHIC ROCK

**CONSISTENCY CLASSIFICATION FOR SOILS**  
 According to the Standard Penetration Test

SPT N-Value (Blows/foot)	Consistency
0-4	Very Loose
5-10	Loose
11-20	Medium Dense
21-30	Dense
31-50	Very Dense
>50	Hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.



**ROCK QUALITY DESIGNATION (ROD) & PERCENT RECOVERY (REC) LOGGING**

ROD =  $\frac{\sum \text{Length of sound core } \geq 4 \text{ inches pieces}}{\text{Total core run length}}$

ROD =  $\frac{10 + 7.5 + 8}{48} \times 100\%$

ROD = 53% (fair)

REC =  $\frac{\text{Length of sound core } \geq 4 \text{ inches pieces}}{\text{Total core run length}} \times 100\%$

REC =  $\frac{10 + 7.5 + 8}{48} \times 100\%$

REC = 53% (fair)

ROD (ROCK QUALITY DESIGNATION)	DESCRIPTION OF ROCK QUALITY
0 - 25%	VERY POOR
25 - 50%	POOR
50 - 75%	FAIR
75 - 90%	GOOD
90 - 100%	EXCELLENT

After Deere & Deere, 1989

**Notes:**

- Samples were taken using a California and modified California split-barrel sampler with an inside diameter (I.D.) of 2.5 in. and 2 in. and an outside diameter (O.D.) of 3 in. and 2.5 in. respectively.
- A safety semi-automatic hammer (140 lb) with a 30 inch drop was used to advance the sampler.
- Blowcounts noted for boring are field blowcounts and have not been corrected.
- Samples were taken using a SPT split-barrel sampler with an inside diameter (I.D.) of 1.4 in. and an outside diameter (O.D.) of 2 in.
- Core samples were taken using an HQ core sampler with a 2.5 in. inside diameter (I.D.) and 3.7 in. outside diameter (O.D.) core barrel.
- Blowcounts 50/4 means 50 blows per 4 in. penetration.
- Horizontal Borings were started approximately 5.5 to 6.0 ft. above existing pavement grade and inclined downward at approximately a 10 degree angle.

**IN-SITU, LAB & FIELD TEST DESIGNATIONS**

- AL ATTERBERG LIMITS
- CA CHEMICAL ANALYSIS
- CN CONSOLIDATION
- CU CONSOLIDATED UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- MD MAX. DRY DENSITY
- PL POINT LOAD
- PP POCKET PENETROMETER
- SA SIEVE ANALYSIS
- TV TORVANE
- UC UNCONFINED COMPRESSION
- UU UNCONSOLIDATED UNDRAINED TRIAXIAL
- VS VANE SHEAR
- WC MOISTURE CONTENT

DESIGN OVERSIGHT

DRAWN BY: A. Sanchez

CHECKED BY: J. Richmond, C.E.G.

KLEINFELDER  
FIELD INVESTIGATION BY:  
DATE: August 2007

BRIDGE NO. X

POST MILE 5.80

**STORM DAMAGE LOCATION**  
**LOG OF TEST BORINGS 2 OF 6**

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

11-1-07

SHEET X OF X

CONSISTENCY CLASSIFICATION FOR SOILS			
According to the Standard Penetration Test			
SPT N-Value (Blows/foot)	Granular	SPT N-Value (Blows/foot)	Cohesive
0-4	Very Loose	0-2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		>31	Hard

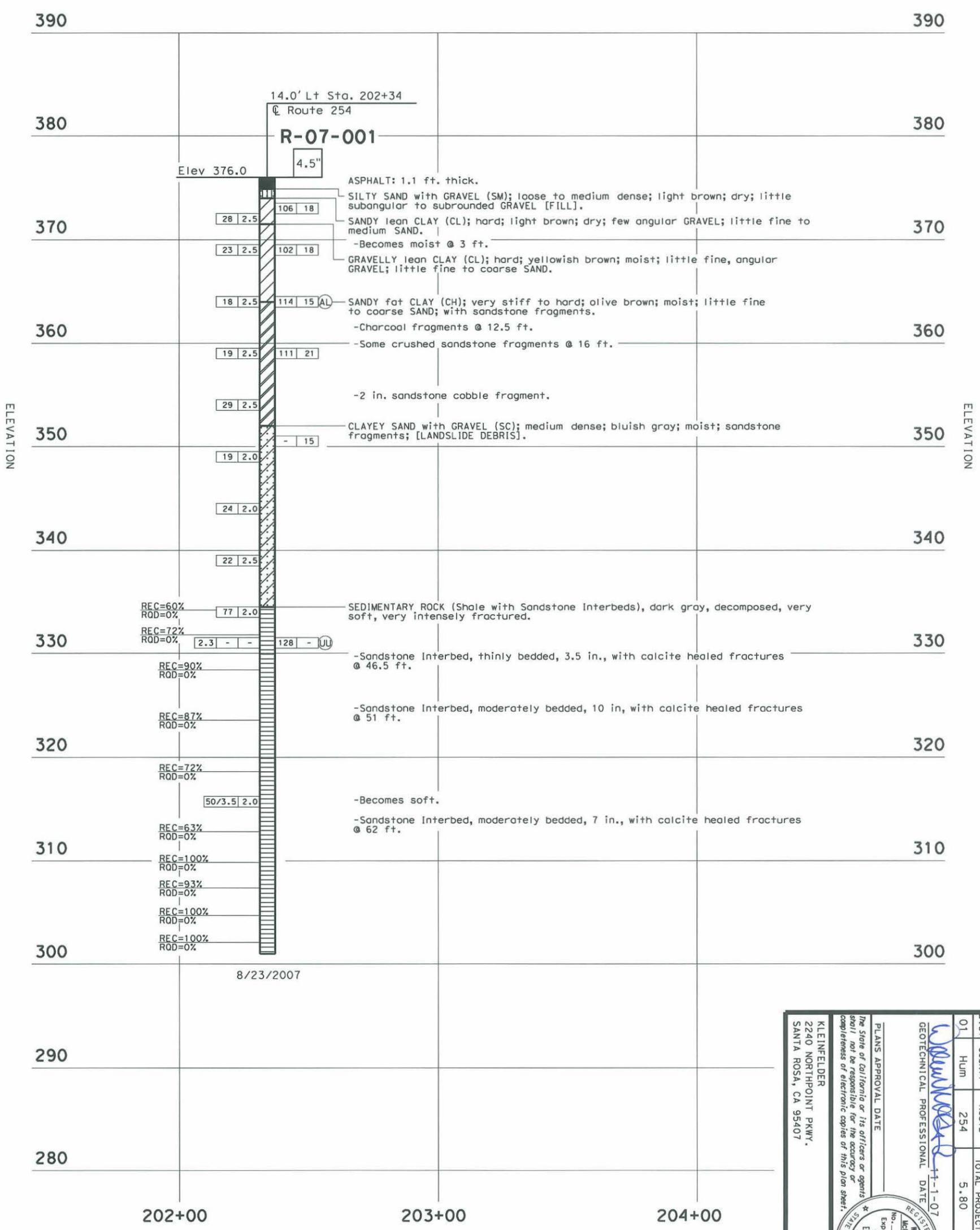
  

LEGEND OF EARTH MATERIALS	
GRAVEL	CLAYEY SILT
SAND	PEAT and/or ORGANIC MATTER
SILT	FILL MATERIAL
CLAY	IGNEOUS ROCK
SANDY CLAY or CLAYEY SAND	SEDIMENTARY ROCK
SANDY SILT or SILTY SAND	METAMORPHIC
SILTY CLAY	

LEGEND OF BORING OPERATIONS	
2 1/4" CONE PENETROMETER	2 1/4" CONE PENETROMETER TEST
SAMPLE BORING (DRY)	ROTARY SAMPLE BORING (WET)
ROTARY SAMPLE BORING (WET)	2 1/4" CONE PENETRATION BORING
AUGER BORING (DRY)	ELECTRONIC CONE PENETROMETER
TEST PIT	
DIAMOND CORE BORING	
JET BORING	
ELECTRONIC CONE PENETROMETER	

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 2 OF 6



**PROFILE**  
 HOR. 1"=20'  
 VER. 1"=5'

DESIGN OVERSIGHT  
 DRAWN BY: A. Sanchez  
 CHECKED BY: J. Richmond, C.E.G.  
 FIELD INVESTIGATION BY: KLEINFELDER  
 DATE: August 2007

PREPARED FOR THE  
**STATE OF CALIFORNIA**  
 DEPARTMENT OF TRANSPORTATION

PROJECT ENGINEER  
 BRIDGE NO. X  
 POST MILE 5.80

LOG OF TEST BORINGS 3 OF 6

STORM DAMAGE LOCATION

CU 01  
 EA 475001  
 FILE => SREDCRST

DIST COUNTY ROUTE POST MILES SHEET TOTAL  
 01 Hum 254 5.80 3 OF 6

REGISTERED GEOLOGIST  
 WILLIAM V. MCGONIGAL III  
 No. 1673  
 Exp. 11-30-08  
 CERTIFIED ENGINEERING GEOLOGIST  
 STATE OF CALIFORNIA

PLANS APPROVAL DATE  
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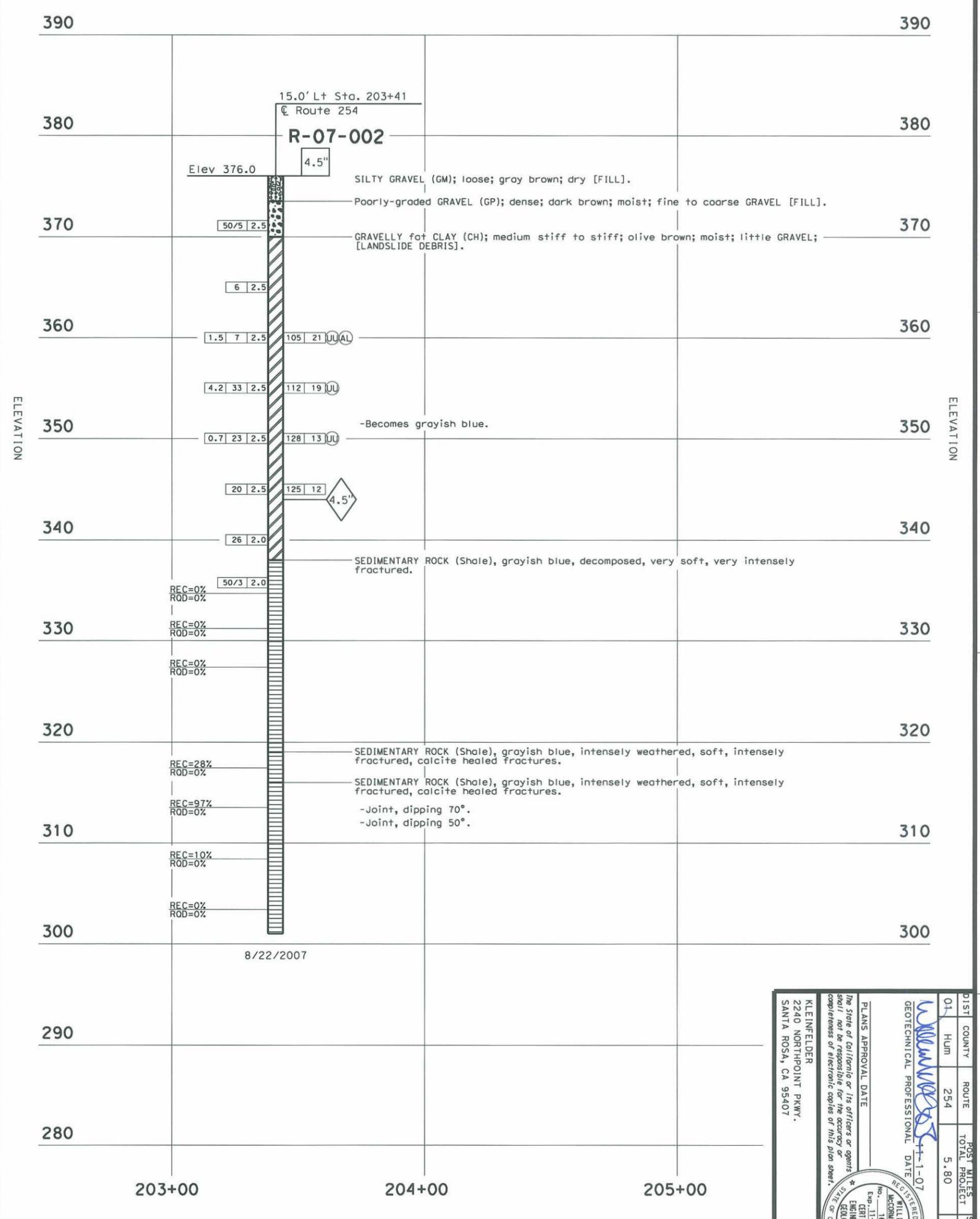
KLEINFELDER  
 2240 NORTHPOINT PKWY.  
 SANTA ROSA, CA 95407

CONSISTENCY CLASSIFICATION FOR SOILS				LEGEND OF EARTH MATERIALS	
According to the Standard Penetration Test				GRAVEL	CLAYEY SILT
SPT N-Value (Blows/foot)	Granular	SPT N-Value (Blows/foot)	Cohesive	SAND	PEAT and/or ORGANIC MATTER
0-4	Very Loose	<2	Very Soft	SILT	FILL MATERIAL
5-10	Loose	2-4	Soft	CLAY	IGNEOUS ROCK
11-30	Medium Dense	5-8	Firm		SEDIMENTARY ROCK
31-50	Dense	9-15	Stiff		METAMORPHIC
>50	Very Dense	16-30	Very Stiff		
		>31	Hard		

LEGEND OF BORING OPERATIONS	
2 1/4" CONE PENETROMETER	ROTARY SAMPLE BORING (WET)
SAMPLE BORING (DRY)	AUGER BORING (DRY)
TEST PIT	DIAMOND CORE BORING
JET BORING	ELECTRONIC CONE PENETROMETER

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 2 OF 6



DESIGN OVERSIGHT

DRAWN BY: A. Sanchez

CHECKED BY: J. Richmond, C.E.G.

FIELD INVESTIGATION BY: KLEINFELDER

DATE: AUGUST 2007

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

PROJECT ENGINEER: CU 01 EA 475001

BRIDGE NO. X

POST MILE 5.80

LOG OF TEST BORINGS 4 OF 6

STORM DAMAGE LOCATION

REVISION DATES (PRELIMINARY STATE ONLY)

11-1-07

FILE => REQUEST

ORIGINAL SCALE IN INCHES 0 1 2 3

FOR REDUCED PLANS

DIST COUNTY ROUTE POST MILES SHEET TOTAL

01 HUM 254 5.80 4 OF 6

REGISTERED GEOLOGIST

WILLIAM V. MACDONALD III

No. 11-30-08

Exp. 11-30-08

1673

ENGINEERING

EX00005151

STATE OF CALIFORNIA

PLANS APPROVAL DATE

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KLEINFELDER

2240 NORTHPOINT PKWY.

SANTA ROSA, CA 95407

**CONSISTENCY CLASSIFICATION FOR SOILS**  
According to the Standard Penetration Test

SPT N-Value (Blows/foot)	Granular	SPT N-Value (Blows/foot)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		>31	Hard

**LEGEND OF EARTH MATERIALS**

GRAVEL	CLAYEY SILT
SAND	PEAT and/or ORGANIC MATTER
SILT	FILL MATERIAL
CLAY	IGNEOUS ROCK
SANDY CLAY or CLAYEY SAND	SEDIMENTARY ROCK
SANDY SILT or SILTY SAND	METAMORPHIC
SILTY CLAY	

**LEGEND OF BORING OPERATIONS**

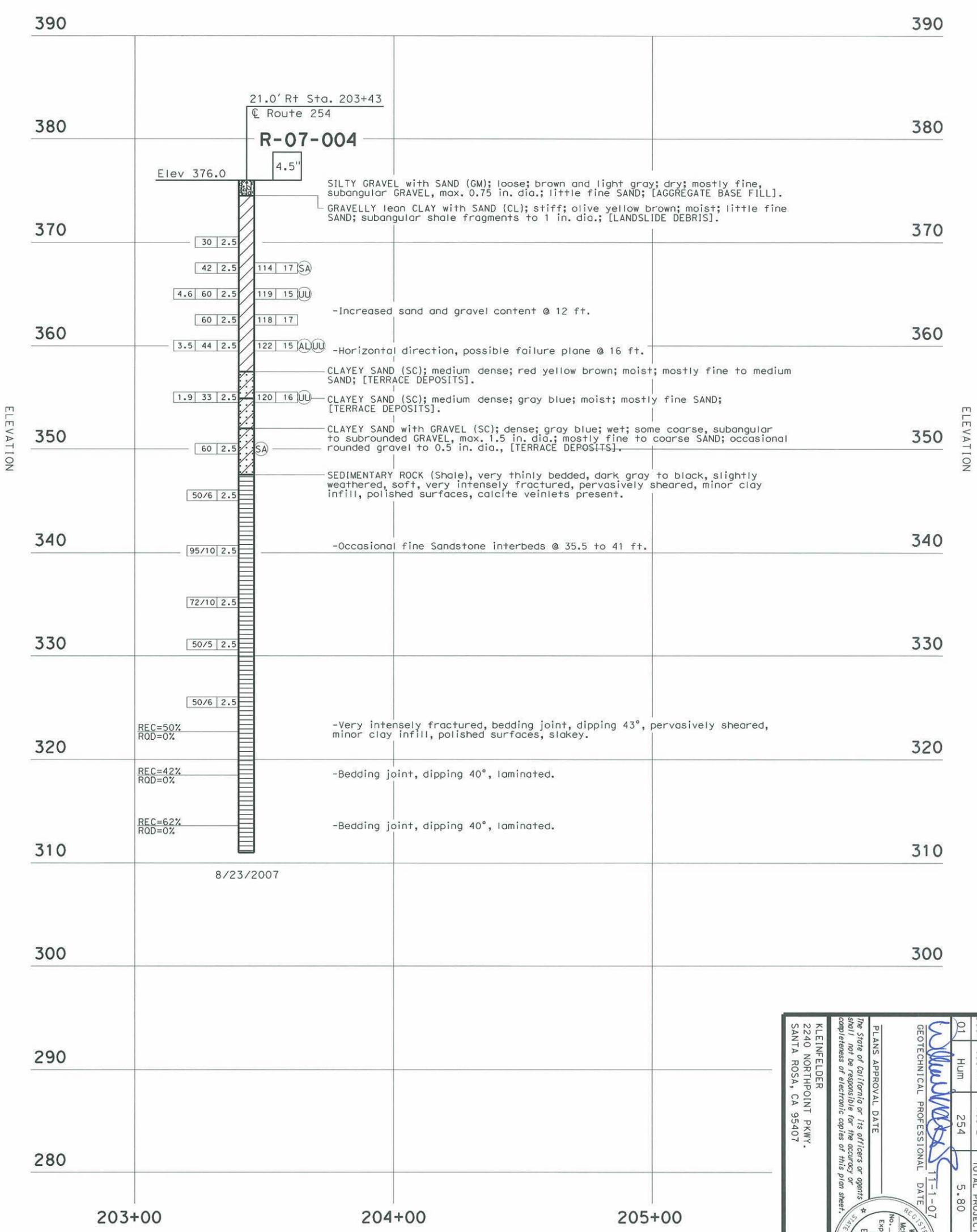
- 2 1/2" CONE PENETROMETER
- SAMPLE BORING (DRY)
- ROTARY SAMPLE BORING (WET)
- AUGER BORING (DRY)
- TEST PIT
- DIAMOND CORE BORING
- JET BORING
- ELECTRONIC CONE PENETROMETER

**2 1/2" CONE PENETRATION BORING**  
Pressure measured along sleeve friction element (150 cal area) divided by pressure measured on tip element (10 cal area)

**ROTARY SAMPLE BORING (WET)**  
Description of material unit weight (lb/cu ft) Moisture % Consolidation test Date measured

**SAMPLE BORING (DRY)**  
Blows per foot (Using 28 lb hand hammer with a 12" free fall) Date measured

FOR PLAN VIEW AND ADDITIONAL NOTES, SEE "LOG OF TEST BORINGS" SHEET 2 OF 6



DESIGN OVERSIGHT: A. Sanchez  
 CHECKED BY: J. Richmond, C.E.G.  
 FIELD INVESTIGATION BY: KLEINFELDER  
 DATE: August 2007  
 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS: 1"=20'  
 PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION  
 PROJECT ENGINEER: X  
 BRIDGE NO.: X  
 POST MILE: 5.80  
 LOG OF TEST BORINGS 5 OF 6  
 SHEET 5 OF 6

**REGISTERED GEOLOGIST**  
 WILLIAM V. MCCORMICK III  
 No. 1673  
 Exp. 11-30-08  
 STATE OF CALIFORNIA

**PLANS APPROVAL DATE**  
 11-1-07

**PROJECT INFORMATION**  
 DIST: COUNTY ROUTE POST MILES SHEET TOTAL SHEETS  
 01 Hum 254 5.80 5.80

**LOCATION**  
 KLEINFELDER  
 2240 NORTHPOINT PKWY.  
 SANTA ROSA, CA 95407



Lab Test Summary

Storm Damage Location: Highway 254 P.M. 5.8 Job # 85401

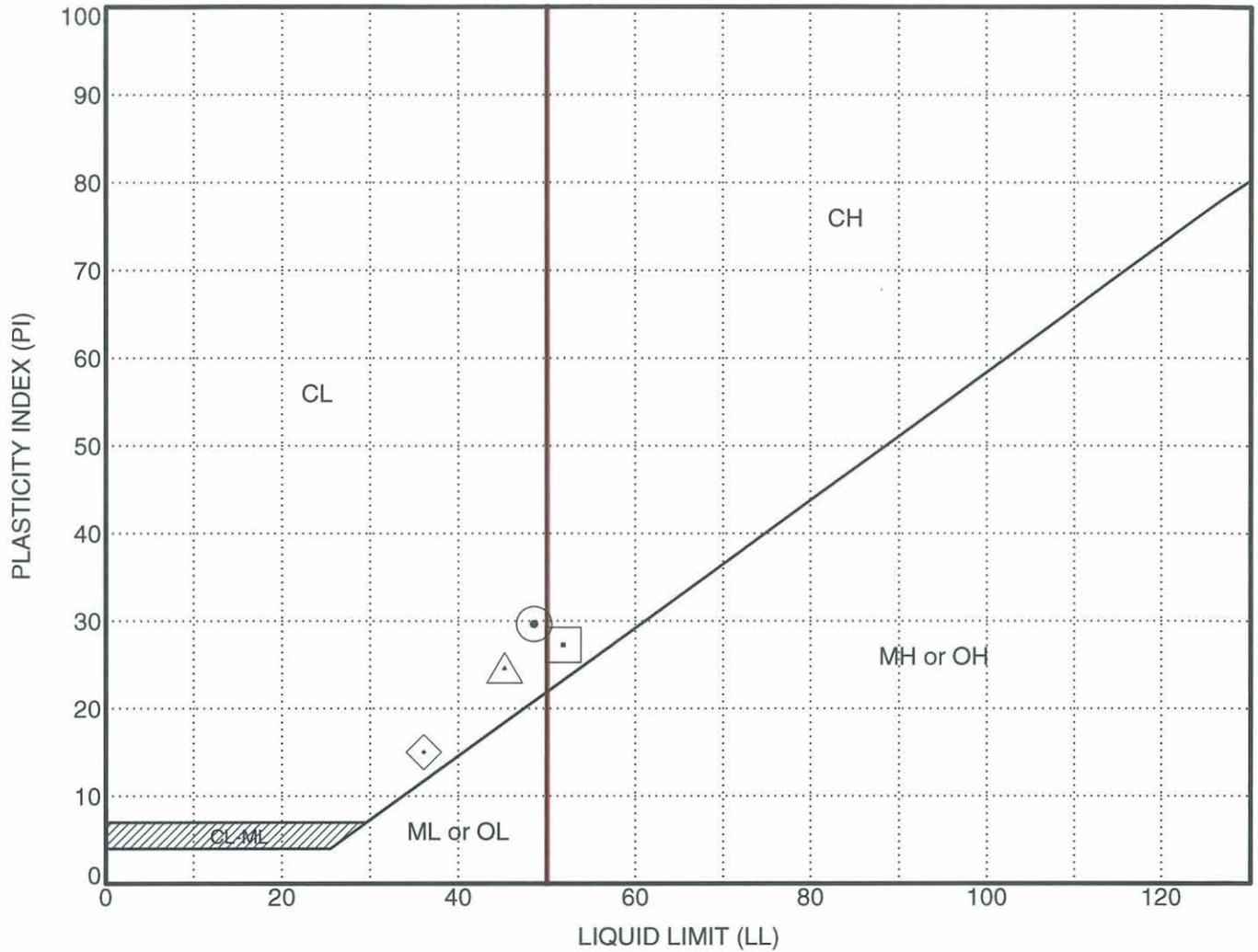
Soil/Rock Type	Boring	Depth (ft)	UU (tsf)	UU (psf)	Confining Pressure (psf)	Dry density (pcf)	Moisture content (%)	Total density (pcf)	PL	LL	PI	-200
FILL : CL	R-07-001	3.5				106	18	125				
DEBRIS : CH	R-07-001	7				102	18	120				
DEBRIS : CH	R-07-001	11.5				114	15	132	19	49	30	
DEBRIS: CH	R-07-001	17				111	21	134				
DEBRIS : SC	R-07-001	26					15					
SHALE	R-07-001	45	2.3	4559	5760	128	-					
DEBRIS: CH	R-07-002	16	1.5	3053	2016	105	21	127	25	52	27	
DEBRIS: CH	R-07-002	21	4.2	8301	2736	112	19	133				
DEBRIS: CH	R-07-002	26	0.7	1436	3456	128	13	144				
DEBRIS: CH	R-07-002	31				125	12	140				
DEBRIS : CL/CH	R-07-003	6.5				100	16	116				
DEBRIS : CL/CH	R-07-003	12				101	23	124	21	45	24	
DEBRIS: CH	R-07-003	36				120	-					
DEBRIS : CL	R-07-004	8.5				114	17	133				53
DEBRIS : CL	R-07-004	11	4.6	9286	1440	119	15	137				
DEBRIS : CL	R-07-004	13.5				118	17	138				
DEBRIS : CL	R-07-004	16	3.5	7070	2016	122	15	141	21	36	15	
TERRACE DEPOSITS: SC	R-07-004	21	1.9	3734	2736	120	16	139				
TERRACE DEPOSITS: SC	R-07-004	26										13

UU – TRIAXIAL UNCONSOLIDATED UNDRAINED TEST

PL - PLASTIC LIMIT

LL - LIQUID LIMIT

PI - PLASTICITY INDEX



SAMPLE SOURCE	CLASSIFICATION	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	% PASSING #200 SIEVE
⊙ R-07-001 @ 11.5	Gravelly Clay (CL)	49	19	30	
□ R-07-002 @ 16.0	Gravelly Clay (CH)	52	25	27	
△ R-07-003 @ 12.0	Sandy Clay (CL)	45	21	24	
◇ R-07-004 @ 16.0	Gravelly Clay with Sand (CL)	36	21	15	



**PLASTICITY CHART**

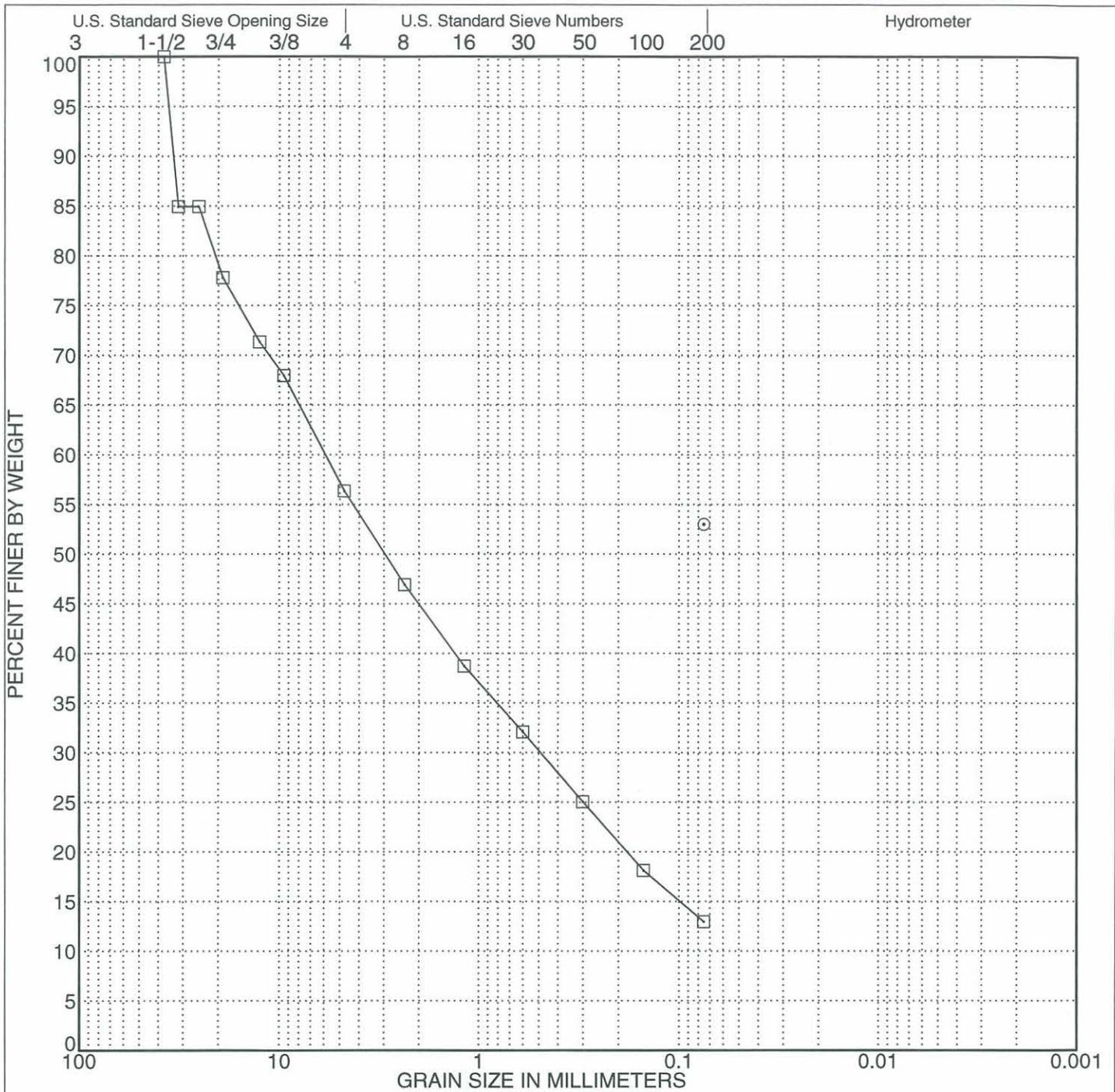
**Storm Damage Location Highway 254  
PM 5.8  
EA 01- 475001**

PLATE

**B-1**

PROJECT NUMBER **85401**

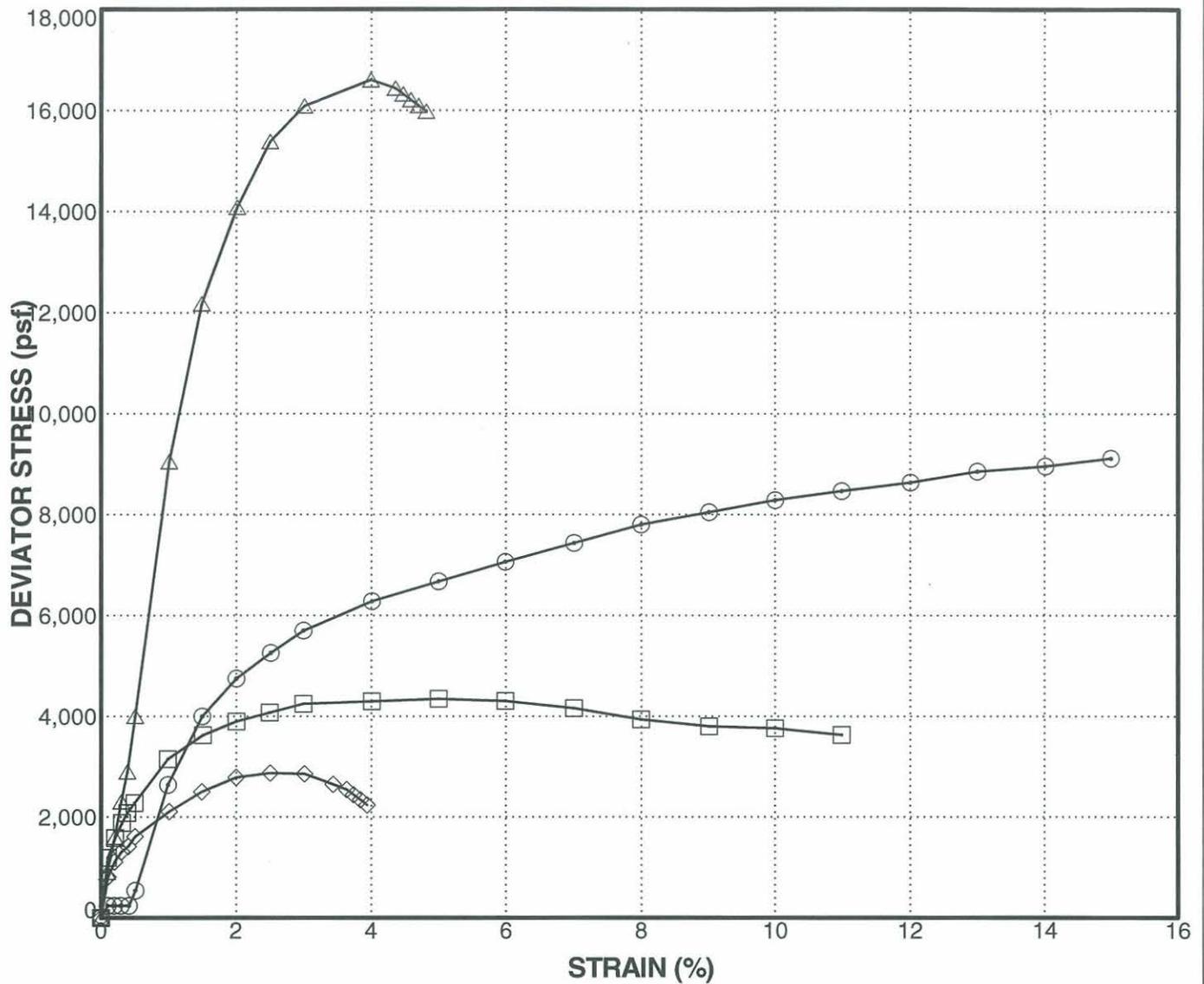
DATE **Nov 2007**



Cobbles	GRAVEL		SAND			SILT	CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

SYMBOL	SAMPLE SOURCE	CLASSIFICATION
⊙	R-07-004 @ 8.5'	Gravelly Clay with Sand (CL)
□	R-07-004 @ 26.0'	Clayey Sand with Gravel (SC)

	<b>PARTICLE SIZE ANALYSIS</b>		PLATE
	Storm Damage Location Highway 254 PM 5.8 EA 01- 475001		<b>B-2</b>
PROJECT NUMBER 85401	DATE	Nov 2007	



Sample Source	Classification	Type of Test	Confinement Pressure (psf)	Shear Strength (psf)	Strain (%)	Dry Density (pcf)	Moisture Content (%)
○ R-07-001 @ 45.0'	Shale	TXUU	5760	4559	15	128	11.2
□ R-07-002 @ 16.0'	Gravelly Clay (CH)	TXUU	2016	2174	5	105	21.0
△ R-07-002 @ 21.0'	Gravelly Clay (CH)	TXUU	2736	8301	4	112	18.5
◇ R-07-002 @ 26.0'	Gravelly Clay (CH)	TXUU	3456	1436	3	128	12.8

UC = Unconfined Compression

TX/UU = Unconsolidated Undrained Triaxial

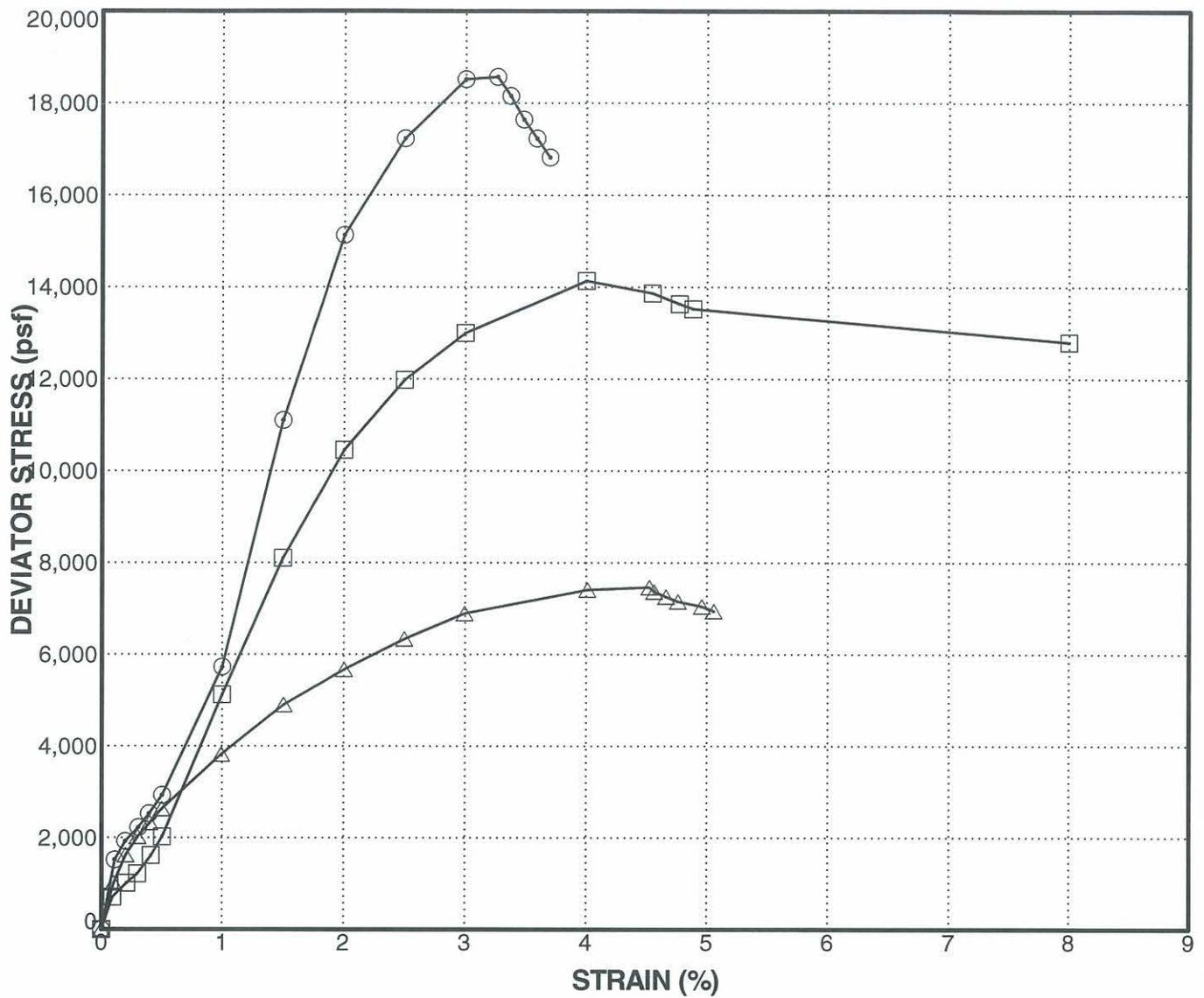


**STRENGTH TEST DATA**

**Storm Damage Location Highway 254  
PM 5.8  
EA 01- 475001**

PLATE

**B-3**



Sample Source	Classification	Type of Test	Confinement Pressure (psf)	Shear Strength (psf)	Strain (%)	Dry Density (pcf)	Moisture Content (%)
⊙ R-07-004 @ 11.0'	Gravelly Clay with Sand (CL)	TXUU	1440	9286	3	119	14.9
⊠ R-07-004 @ 16.0'	Gravelly Clay with Sand (CL)	TXUU	2016	7070	4	122	15.3
△ R-07-004 @ 21.0'	Clayey Sand (SC)	TXUU	2736	3734	5	120	15.7

UC = Unconfined Compression

TX/UU = Unconsolidated Undrained Triaxial



**STRENGTH TEST DATA**

Storm Damage Location Highway 254  
PM 5.8  
EA 01- 475001

PLATE

**B-4**

PROJECT NUMBER 85401

DATE Nov 2007



AP Engineering & Testing, Inc.

## CORROSION TEST RESULTS

Client Name: Kleinfelder  
Project Name: Caltrans  
Project No.: 85401

AP Job No.: 27-0928  
Date: 09/19/07

EA # Highway & PM	Boring No.	Remarks	Soil Type	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (%)	Chloride Content (%)
EA01-475001 HUM 254 PM 5.8	R-07- 004	13+15 ft	CL	2200	7.3	0.0005	0.0146
EA01-475001 HUM 254 PM 5.8	R-07- 001	20 ft	CL	1800	7.4	0.0087	0.0070
EA01-475101 HUM 254 PM 5.58	R-07- 004	10.5-15.5 ft	CL	1900	7.3	0.0004	0.0074
EA01-475101 HUM 254 PM 5.58	R-07- 002	30 ft	CL	1700	7.4	0.0003	0.0135
EA01-475101 HUM 254 PM 5.1	R-07- 004	13 ft	CL	1700	7.4	0.0043	0.0129
EA01-475101 HUM 254 PM 5.1	R-07- 002	32 ft	CL	2200	7.6	0.0016	0.0127

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

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

November 3, 2009

Department of Transportation  
1656 Union Street  
Eureka, California 95501

Attention: Horacio Paras, JR.

Subject: Underground Classification No. C052-023-10T  
Route 254 Improvements – Humboldt County

Mr. Paras:

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

When the contractor who will be performing the work is selected, please advise them to notify this office to schedule the mandated Prejob Conference with the Division prior to commencing any activity associated with construction or rehabilitation of the tunnel.

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 blue 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

C052-023-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 1656 Union Street, Eureka, California 95501

(MAILING ADDRESS)

at ROUTE 254 IMPROVEMENTS – HUMBOLDT 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\*\*\*

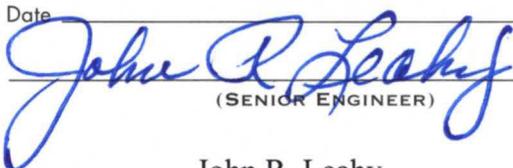
1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust 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-five 36-inch diameter by 50 feet deep drilled shafts (retaining wall) project located along Route 254 approximately 50 feet north of the intersection of Route 254 and Woodside Road, Miranda, Humboldt County.

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

November 3, 2009

Date

  
(SENIOR ENGINEER)

John R. Leahy

