

INFORMATION HANDOUT

For Contract No. 02-2C0904

At 02-Plu-70-50.6/51.7

Identified by

Project ID 0200000161

PLAC Condition Responsibility (PCR) Summary

PERMITS

United States Army Corps of Engineers

Non-Reporting Nationwide 404

WATER QUALITY

California Regional Water Quality Control Board

Central Valley Region
Board Order No. 2003-0017 DWQ

AGREEMENTS

California Department of Fish and Wildlife

Notification No. 1600-2015-0200-R2
Bat Survey Report

Plumas National Forest Service Agreement

RAILROAD RELATIONS

Railroad Relations and Insurance Requirements

MATERIALS INFORMATION

Foundation Report for Retaining Wall No.50 dated September 10, 2015

Foundation Report for Spring Garden BOH (Bridge No. 09-0062) dated September 30, 2015

Final Hydraulic Report for Spring Garden Bridge and Overhead (Bridge No. 09-0062)

Asbestos and Lead-Containing Paint Survey Report

Aerially Deposited Lead and Naturally Occurring Asbestos Site Investigation Report

Cut and Fill Slope Recommendations and Material Information

Water Source Information

For Contract No. 02-2C0904

PLAC Condition Responsibility (PCR) Summary

PLAC CONDITION RESPONSIBILITY (PCR) SUMMARY

General:

This PCR Summary clarifies various PLAC requirements. Perform all work described in the PLACs on behalf of the Department unless otherwise stated below in Table 2. If a discrepancy exists between the PCR Summary and the PLAC, the PCR Summary governs.

Definitions:

Agency: A board, agency, or other entity that issues a PLAC

Activity: A task, event or other project element

PLAC Condition: a work activity and/or submittal required by a PLAC

Table 1 - Clarification of PLAC Requirements		
PLAC Name	Section of the PLAC	PLAC Requirement
All PLACs	Applicable PLAC sections	<p>Submittals: Submit to the Engineer when PLAC conditions require:</p> <ol style="list-style-type: none"> 1. Communications. The Engineer will contact the agencies. 2. Records to be maintained, within 5 working days after the activity. 3. Submittals 5 days before the agencies require them. The Engineer will review and submit to the agencies.
California Department of Fish and Wildlife Streambed Alteration Agreement Notification No: 1600-2015-0200-R2	Under Project Description	Para 4 Tree removal has been minimized to cut/fill areas
	Measures to Protect Fish and Wildlife Resources	Measure 1.4. Both the Contractor and Caltrans will agree to allow DFG personnel to enter the project site at any time, after notifying the Resident Engineer, to verify compliance with the Agreement
		Measure 2.4 A bat colony was detected and a copy of the report is provided.
US Army Corps of Engineers Nationwide Permit 14	Sacramento District Regional Conditions	14. Both the Contractor and Caltrans will agree to allow Corps representatives to inspect the authorized activity at any time deemed necessary, after notifying the Resident Engineer, to determine compliance with the terms and conditions of the NWP verification

PLAC CONDITION RESPONSIBILITY (PCR) SUMMARY

Table 2 - Work to be Performed by the Department		
PLAC Name	Section of the PLAC	PLAC Requirement
Central Valley Regional Water Quality Control Board 401 Water Quality Certification Order: WDID#5A32CR00147	Additional Storm Water Quality Conditions	#3 Maintenance provisions after Contract Acceptance become the Department's responsibility.
California Department of Fish and Wildlife Streambed Alteration Agreement Notification No: 1600-2015-0200-R2	Measures to Protect Fish and Wildlife Resources	Measure 1.4. Both the Contractor and Caltrans will agree to allow DFG personnel to enter the project site at any time, after notifying the Resident Engineer, to verify compliance with the Agreement
		Measure 2.3 Bat survey was completed and the report is provided.
		Measure 2.5 The Department will provide the biologist.
US Army Corps of Engineers Nationwide Permit 14	Sacramento District Regional Conditions	14. Both the Contractor and Caltrans will agree to allow Corps representatives to inspect the authorized activity at any time deemed necessary, after notifying the Resident Engineer, to determine compliance with the terms and conditions of the NWP verification

For Contract No. 02-2C0904

PERMITS

United States Army Corps of Engineers

Non-Reporting Nationwide 404



U S Army Corps of
Engineers
Sacramento District

Nationwide Permit Summary

33 CFR Part 330; Issuance of Nationwide
Permits – March 19, 2012

Non-Reporting

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 31.) (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. Regional Conditions

1. Regional Conditions for California, excluding the Tahoe Basin

http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-CA.pdf

~~2. Regional Conditions for Nevada, including the Tahoe Basin~~

~~http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-NV.pdf~~

~~3. Regional Conditions for Utah~~

~~http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-UT.pdf~~

~~4. Regional Conditions for Colorado.~~

~~http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-CO.pdf~~

B. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, 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. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR § 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

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,

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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. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.
- 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 NWP 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.~~
- 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 and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.
- 15. **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.
- 16. ~~**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 responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).~~
- 17. **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.
- 18. ~~**Endangered Species.**~~
 - (a) ~~No activity is authorized under any NWP which is likely to directly or indirectly 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 directly or indirectly 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. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary.~~

~~(c) Non-federal permittees must submit a pre-construction notification to 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 might be affected by the proposed work or that utilize the designated critical habitat that might 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. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.~~

~~(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 NWP.~~

(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, The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) 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/> or <http://www.fws.gov/ipac> and <http://www.noaa.gov/fisheries.html> respectively.

19. **Migratory Birds and Bald and Golden Eagles.** The permittee is responsible for obtaining any “take” permits required under the U.S. Fish and Wildlife Service’s regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such “take” permits are required for a particular activity.

20. **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. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary.

~~(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 on, 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)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. 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 on 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. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.~~

~~□ (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, 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.~~

□ **21. Discovery of Previously Unknown Remains and Artifacts.** If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

~~□ **22. Designated Critical Resource Waters.** Critical resource waters include, NOAA managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or~~

~~ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.~~

~~□ (a) Discharges of dredged or fill material into waters of the United States are not authorized by NHPAs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.~~

~~□ (b) For NHPAs 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 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NHPAs only after it is determined that the impacts to the critical resource waters will be no more than minimal.~~

□ **23. 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 for resource losses) 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 either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, 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. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.~~

~~□ (1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment.~~

~~□ (2) 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.~~

- ~~□ (3) If permittee responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(e)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).~~
- ~~□ (4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.~~
- ~~□ (5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.~~
- ~~□ (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, 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 NWPs. 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 restoration or 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. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. 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 programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.~~
- ~~(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.~~
- ~~□ **24. Safety of Impoundment Structures.** To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.~~
- ~~□ **25. 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.~~
- ~~□ **26. 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.~~
- ~~□ **27. 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.~~

~~☐ 28. 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.~~

~~☐ 29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:~~

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

~~-----
(Transferee)~~

~~-----
(Date)~~

~~☐ 30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required compensatory mitigation. The success of any required permittee responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:~~

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

~~☐ (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and~~

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

~~☐ 31. 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, if the PCN is determined to be incomplete, notify the prospective permittee within that 30-day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers 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) 45 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 18 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 20 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 there 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)) has been 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 may not 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, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; 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 results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);~~
- ~~□ (4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, 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 on the project site, 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, as 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, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. 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 NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.~~
- ~~□ (2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2 acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete 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 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. The comments must explain why the agency believes the adverse effects will be more than minimal. 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 concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer 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 with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.~~

~~C. District Engineer's Decision~~

~~☐ 1. 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. For a linear project, this determination will include an evaluation of the individual crossings to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to intermittent or ephemeral streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51 or 52, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in minimal adverse effects. When making minimal effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.~~

~~☐ 2. 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 activity 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 activity specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. 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 proposed compensatory mitigation 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, including any activity specific conditions added to the NWP authorization by the district engineer.~~

~~☐ 3. 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: (a) 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; (b) 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 (c) 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, with activity specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed 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 or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.~~

~~D. Further Information~~

~~1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.~~

For Contract No. 02-2C0904

WATER QUALITY

California Regional Water Quality Control Board

Central Valley Region
Board Order No. 2003-0017 DWQ

Central Valley Regional Water Quality Control Board

30 November 2015

Ms. Deena Matagulay
Caltrans
1031 Butte Street
Redding, CA 96001

CLEAN WATER ACT §401 TECHNICALLY CONDITIONED WATER QUALITY CERTIFICATION FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS FOR THE SPRING GARDEN BRIDGE REHABILITATION PROJECT (WDID#5A32CR00147), QUINCY, PLUMAS COUNTY

ACTION:

1. Order for Standard Certification
2. Order for Technically-conditioned Certification
3. Order for Denial of Certification

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to §13330 of the California Water Code and §3867 of Title 23 of the California Code of Regulations (23 CCR).
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 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The validity of any non-denial certification action shall be conditioned upon total payment of the full fee required under 23 CCR §3833, unless otherwise stated in writing by the certifying agency.
4. Certification is valid for the duration of the described project. Caltrans shall notify the Central Valley Water Board in writing within 7 days of project completion.

ADDITIONAL TECHNICALLY CONDITIONED CERTIFICATION CONDITIONS:

In addition to the four standard conditions, Caltrans shall satisfy the following:

1. Caltrans shall notify the Central Valley Water Board in writing 7 days in advance of the start of any in-water activities.
2. Except for activities permitted by the U.S. Army Corps under §404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.
3. All areas disturbed by project activities shall be protected from washout or erosion.
4. Caltrans shall maintain a copy of this Certification and supporting documentation (Project Information Sheet) at the Project site during construction for review by site personnel and agencies. All personnel (employees, contractors, and subcontractors) performing work on the proposed project shall be adequately informed and trained regarding the conditions of this Certification.
5. An effective combination of erosion and sediment control Best Management Practices (BMPs) must be implemented and adequately working during all phases of construction.
6. All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.
7. Caltrans shall perform surface water sampling: 1) When performing any in-water work; 2) In the event that project activities result in any materials reaching surface waters or; 3) When any activities result in the creation of a visible plume in surface waters. The following monitoring shall be conducted immediately upstream out of the influence of the project and 300 feet downstream of the active work area. Sampling results shall be submitted to this office within two weeks of initiation of sampling and every two weeks thereafter. The sampling frequency may be modified for certain projects with written permission from the Central Valley Water Board.

Parameter	Unit	Type of Sample	Frequency of Sample
Turbidity	NTU	Grab	Every 4 hours during in water work
Settleable Material	ml/l	Grab	Same as above.
Visible construction related pollutants	Observations	Visible Inspections	Continuous throughout the construction period

8. Activities shall not cause turbidity increases in surface water to exceed:
- (a) where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTU;
 - (b) where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
 - (c) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
 - (d) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs;
 - (e) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

Except that these limits will be eased during in-water working periods to allow a turbidity increase of 15 NTU over background turbidity as measured in surface waters 300 feet downstream from the working area. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. Averaging periods may only be assessed by prior permission of the Central Valley Water Board.

9. Activities shall not cause settleable matter to exceed 0.1 ml/l in surface waters as measured in surface waters 300 feet downstream from the project.
10. The discharge of petroleum products or other excavated materials to surface water is prohibited. Activities shall not cause visible oil, grease, or foam in the work area or downstream. Caltrans shall notify the Central Valley Water Board immediately of any spill of petroleum products or other organic or earthen materials.
11. Caltrans shall notify the Central Valley Water Board immediately if the above criteria for turbidity, settleable matter, oil/grease, or foam are exceeded.
12. Caltrans shall comply with all Department of Fish and Wildlife 1600 requirements for the project.
13. Caltrans must obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board for any project disturbing an area of 1 acre or greater.
14. The Conditions in this water quality certification are based on the information in the attached "Project Information." If the information in the attached Project Information is modified or the project changes, this water quality certification is no longer valid until amended by the Central Valley Water Board.
15. 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 State law and section 401 (d) of the federal 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 ensure compliance into this Order.

- a. If Caltrans or a duly authorized representative of the project fails or refuses to furnish technical or monitoring reports, as required under this Order, or falsifies any information provided in the monitoring reports, the applicant is subject to civil monetary liabilities, for each day of violation, or criminal liability.
 - b. In response to a suspected violation of any condition of this Order, the Central Valley Water Board may require Caltrans to furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
 - c. Caltrans shall allow the staff(s) of the Central Valley Water Board, or an authorized representative(s), upon the presentation of credentials and other documents, as may be required by law, to enter the project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this certification and determining the ecological success of the project.
16. Staff of the Central Valley Water Board has prepared total maximum daily load (TMDL) allocations that, once approved, would limit methylmercury in storm water discharges to the Sacramento-San Joaquin Delta. The Central Valley Water Board has scheduled these proposed allocations to be considered for adoption. When the Central Valley Water Board adopts the TMDL and once approved by the Environmental Protection Agency, the discharge of methylmercury may be limited from the proposed project. The purpose of this condition is to provide notice to Caltrans that methylmercury discharge limitations and monitoring requirements may apply to this project in the future and also to provide notice of the Central Valley Water Board's TMDL process and that elements of the planned construction may be subject to a TMDL allocation.

ADDITIONAL STORM WATER QUALITY CONDITIONS:

Caltrans shall also satisfy the following additional storm water quality conditions:

1. During the construction phase, Caltrans must employ strategies to minimize erosion and the introduction of pollutants into storm water runoff. These strategies must include the following:
 - (a) the Storm Water Pollution Prevention Plan (SWPPP) must be prepared during the project planning and design phases and before construction;
 - (b) an effective combination of erosion and sediment control Best Management Practices (BMPs) must be implemented and adequately working prior to the rainy season and during all phases of construction.
2. Caltrans must minimize the short and long-term impacts on receiving water quality from the Spring Garden Bridge Rehabilitation Project by implementing the following post-construction storm water management practices:

- (a) minimize the amount of impervious surface;
- (b) reduce peak runoff flows;
- (c) provide treatment BMPs to reduce pollutants in runoff;
- (d) ensure existing waters of the State (e.g., wetlands, vernal pools, or creeks) are not used as pollutant source controls and/or treatment controls;
- (e) preserve and, where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones;
- (f) limit disturbances of natural water bodies and natural drainage systems caused by development (including development of roads, highways, and bridges);
- (g) use existing drainage master plans or studies to estimate increases in pollutant loads and flows resulting from projected future development and require incorporation of structural and non-structural BMPs to mitigate the projected pollutant load increases in surface water runoff;
- (h) identify and avoid development in areas that are particularly susceptible to erosion and sediment loss, or establish development guidance that protects areas from erosion/ sediment loss;
- (i) control post-development peak storm water run-off discharge rates and velocities to prevent or reduce downstream erosion, and to protect stream habitat.

3. Caltrans must ensure that all development within the project provides verification of maintenance provisions for post-construction structural and treatment control BMPs. Verification shall include one or more of the following, as applicable:

- (a) the developer's signed statement accepting responsibility for maintenance until the maintenance responsibility is legally transferred to another party; or
- (b) written conditions in the sales or lease agreement that require the recipient to assume responsibility for maintenance; or
- (c) written text in project conditions, covenants and restrictions for residential properties assigning maintenance responsibilities to a home owner's association, or other appropriate group, for maintenance of structural and treatment control BMPs; or
- (d) any other legally enforceable agreement that assigns responsibility for storm water BMP maintenance.

REGIONAL WATER QUALITY CONTROL BOARD CONTACT PERSON:

Scott A. Zaitz, R.E.H.S., Redding Branch Office, 364 Knollcrest Drive, Suite 205, Redding, California 96002, Scott.Zaitz@waterboards.ca.gov, (530) 224-4784

WATER QUALITY CERTIFICATION:

I hereby issue an order certifying that any discharge from Caltrans, Spring Garden Bridge Rehabilitation Project (WDID# 5A32CR00147) will comply with the applicable provisions of §301 ("Effluent Limitations"), §302 ("Water Quality Related Effluent Limitations"), §303 ("Water Quality Standards and Implementation Plans"), §306 ("National Standards of Performance"), and §307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under 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)."

Except insofar as may be modified by any preceding conditions, all certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with Caltrans's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the Water Quality Control Plan *for the Sacramento River and San Joaquin River*, Fourth Edition, revised October 2011 (Basin Plan).

Any person aggrieved by this action may petition the State Water Quality Control Board to review the action in accordance with California Water Code § 13320 and California Code of Regulations, title 23, § 2050 and following. The State Water Quality Control Board must receive the petition by 5:00 p.m., 30 days after the date of this action, except that if the thirtieth day following the date of this action falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Quality Control Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.



(for) Pamela C. Creedon
Executive Officer

Enclosure: Water Quality Order No. 2003-0017 DWQ

cc w/o
enclosures: Mr. Matt Kelley, U.S. Army Corp of Engineers, Sacramento
Department of Fish and Wildlife, Region 2, Rancho Cordova
U.S. Fish and Wildlife Service, Sacramento
Mr. Bill Jennings, CALSPA, Stockton

cc w/o
enclosures
by email: U.S. EPA, Region 9, San Francisco
Mr. Bill Orme, SWRCB, Certification Unit, Sacramento

PROJECT INFORMATION

Application Date: 8 September 2015

Application Complete Date: 6 October 2015

Applicant: Caltrans, Attn: Ms. Deena Matagulay

Project Name: Spring Garden Bridge Rehabilitation Project

Application Number: WDID No. 5A32CR00147

U.S. Army Corps File Number: Non-Reporting

Type of Project: Rehabilitation of the existing Spring Garden Bridge and Overhead Bridge on State Route 70 in Plumas County.

Project Location: Section 25, Township 24 North, Range 10 East, MDB&M.
Latitude: 39°54'42" and Longitude: -120°48'45"

County: Plumas County

Receiving Water(s) (hydrologic unit): Greenhorn Creek, which is tributary to North Fork Feather River. Feather River Hydrologic Unit-Quincy Hydrologic Subarea No. 518.52

Water Body Type: Riparian, Streambed

Designated Beneficial Uses: The Water Quality Control Plan *for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009 has designated beneficial uses for surface and ground waters within the region. Beneficial uses that could be impacted by the project include: Municipal and Domestic Water Supply (MUN); Agricultural Supply (AGR); Industrial Supply (IND), Hydropower Generation (POW); Groundwater Recharge, Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, and /or Early Development (SPWN); and Wildlife Habitat (WILD).

Project Description (purpose/goal): The Spring Garden Bridge Rehabilitation Project consists of rehabilitating the existing Spring Garden Bridge and Overhead on State Route 70 in Plumas County. The new bridge would be approximately the same height and length as the existing bridge and approximately 12 feet wider than the existing bridge. The rehabilitated bridge would maintain the existing alignment of the existing bridge. Construction would occur over two years and utilize the One Way Reversing Traffic Control methodology.

Preliminary Water Quality Concerns: Construction activities may impact surface waters with increased turbidity and settleable matter.

Proposed Mitigation to Address Concerns: Caltrans will implement Best Management Practices (BMPs) to control sedimentation and erosion. All temporary affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.

Caltrans will conduct turbidity and settleable matter testing during in-water work, stopping work if Basin Plan criteria are exceeded or are observed.

Fill/Excavation Area Project implementation will permanently impact 0.020 acre/75 linear feet of riparian and 0.006 acre/45 linear feet of un-vegetated streambed.

Dredge Volume: Not Applicable

U.S. Army Corps of Engineers Permit Number: Nationwide Permit #14 (Linear Transportation Projects)

Department of Fish and Wildlife Streambed Alteration Agreement: Caltrans applied for a Streambed Alteration Agreement on 25 August 2015. Lake & Streambed Alteration Agreement Number: 1600-2015-0200-R2

Possible Listed Species: None

Status of CEQA Compliance: Caltrans signed a final Determination approving a Negative Declaration on 26 June 2015 pursuant to Division 13 of the California Public, stating the project will have a less-than-significant effect on the environment.

Compensatory Mitigation: The Central Valley Water Board is not requesting compensatory mitigation.

Application Fee Provided: On 8 September 2015 a certification application fee of \$200.00 was submitted as required by 23 CCR §3833b(3)(A) and by 23 CCR §2200(e).

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,¹ 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.

¹ "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

For Contract No. 02-2C0904

AGREEMENTS

California Department of Fish and Wildlife

Notification No. 1600-2015-0200-R2
Bat Survey Report



DEPARTMENT OF FISH AND WILDLIFE

Charlton H. Bonham, Director

North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670-4599
916-358-2900
www.wildlife.ca.gov



FEB 17 2016

Date

Deena Matagulay
California Department of Transportation
1031 Butte Street
Redding, CA 96001

Subject: Final Lake or Streambed Alteration Agreement
Notification No. 1600-2015-0200-R2

Dear Mr. Johnson:

Enclosed is the final Streambed Alteration Agreement (Agreement) for the Spring Garden Bridge Rehabilitation Project (Project). Before the California Department of Fish and Wildlife (Department) may issue an Agreement, it must comply with the California Environmental Quality Act (CEQA). In this case, the Department, acting as a responsible agency, filed a notice of determination (NOD) on the same date it signed the Agreement. The NOD was based on information contained in the Mitigated Negative Declaration the lead agency prepared for the Project.

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

If you have any questions regarding this matter, please contact Juan Lopez Torres, Senior Environmental Scientist (Specialist) at (916) 358-2951 or Juan.Torres@wildlife.ca.gov.

Sincerely,

Tina Bartlett
Regional Manager

ec: Juan Lopez Torres, Senior Environmental Scientist (Specialist),
Juan.Torres@wildlife.ca.gov.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
NORTH CENTRAL REGION
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CA 95670



STREAMBED ALTERATION AGREEMENT (REVISION 3)
NOTIFICATION No. 1600-2015-0200-R2

CALIFORNIA DEPARTMENT OF TRANSPORTATION
SPRING GARDEN BRIDGE REHABILITATION PROJECT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (Department) and California Department of Transportation (Permittee) as represented by Deena Matagulay.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified the Department on September 08, 2015, that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, the Department 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 State Route (SR) 70 at Greenhorn Creek between post mile (PM) 50.9 and PM 51.6 tributary to East Branch north Fork Feather River, in the County of Plumas, State of California. The project is located on the Spring Garden California U.S. Geological Survey (USGS) 7.5-minute quadrangle, R10E, T24N, Section 25; Latitude 39°54'42.13"N, Longitude 120°48'45.96"W.

PROJECT DESCRIPTION

Permittee proposes to rehabilitate the existing Spring Garden Bridge and Overhead (Bridge) on SR 70. The rehabilitated Bridge will maintain the existing Bridge alignment. The rehabilitated bridge structure will provide a 12-foot-wide lane in each direction, with eight-foot-wide shoulders. The existing Metal Beam Guard Rail and approach rail will be removed and upgraded to meet standard. Existing paint will be removed and existing girders will be repainted. Ice warning conduit and conductors will be relocated within the widened roadway.

The existing concrete bridge deck will be replaced. Abutments 1 and 8 will be widened. All of the bents will be widened to support the wider bridge. The widening of Bents 2, 3, and 7 will include the installation of concrete infill walls with footings between the existing columns. Construction of the infill walls will require excavation between the existing columns down to the existing footings. Work on Bents 4, 5, and 6 will consist of the widening of the bent caps. Shoring may be needed for work at Bent 4 to avoid impacts to the railroad tracks and Greenhorn Creek. Clean gravel pads will be placed in Greenhorn Creek in order to place falsework for work on Bent 5; the pad will be up to 3 feet wider than the bent footing. Bent 5 footing is 3 feet wide by 40 feet long.

Access to the construction area will be via an existing road to the southeast of the existing bridge, and a new access road that will be constructed to the northwest of the existing bridge, north of the proposed retaining wall. The existing road will be widened to accommodate construction equipment. A trestle will be placed across Greenhorn Creek to access Bents 2, 3, and 4. The trestle will be used for both vehicle crossing and other construction uses. The trestle will be approximately 90 feet long by 28 feet wide. Staging will be limited to within the project right-of-way, as well as an existing U.S. Forest Service/Union Pacific Railroad access road that leaves State Route 70 from the east side of the Bridge.

Construction will extend approximately 1,150 feet to the west and approximately 700 feet to the east of the Bridge in order to tie back into the existing roadway. The project will require grading, and cut/fill from the west side of the bridge in order to accommodate the wider roadway and provide material for the new retaining wall behind Abutment 1. Retaining walls to the southwest of the Bridge and northeast of the Bridge may also be necessary in order to support the new cut slope and to avoid sensitive resources, respectively. The project will include the removal of trees on the slope to the southwest of the Bridge in order to maximize sunlight exposure for the Bridge, as well as the removal of trees along the road in either direction of the bridge in order to establish a Clear Recovery Zone.

Riparian vegetation under the Bridge within the right-of-way will be topped up to 15 feet from their tops for construction activities. No riparian trees will be removed. A chain link fence and splashboard may be constructed to limit project impacts to the railroad tracks that run underneath the Bridge.

The project will temporarily impact 0.03 acres of Department jurisdictional areas consisting of 0.01 acre of perennial streambed and 0.02 acres of riparian vegetation.

Exhibit A includes Figure 2 depicting the project impacts.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: nesting birds and aquatic and terrestrial plant and wildlife species.

The adverse effects the project could have on the fish or wildlife resources identified above include: disruption to nesting birds, disruption to aquatic or terrestrial plant and wildlife species, change in contour of channel or bank, soil compaction or other disturbance.

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 the Department 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 the Department 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, the Department shall contact Permittee to resolve any conflict.
- 1.4 **Project Site Entry.** Permittee agrees that Department personnel may, with notification of the Resident Engineer, enter the project site at any time to verify compliance with the Agreement.
- 1.5 **Does Not Authorize "Take."** This Agreement does not authorize "take" of any listed species. Take is defined as hunt, pursue, catch, capture or kill or attempt to hunt, pursue, catch, capture, or kill. If there is potential for take of any listed species to occur, the Operator shall consult with the Department as outlined in FGC Section 2081 and shall obtain the required state and federal threatened and endangered species permits.

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 **Work Period in Dry Weather Only.** Work within waters of the state shall be restricted to periods of low stream flow and dry weather. All necessary erosion

control measures shall be implemented prior to the onset of precipitation. Construction activities halted due to precipitation may resume when precipitation ceases and the National Weather Service 72-hour weather forecast indicates a 20% or less chance of precipitation of greater than or equal to ¼-inch of accumulation for the subsequent 24-hour period. No work activity shall commence unless all equipment and materials that could be mobilized by stream water flow are removed from the channel at least 12 hours prior to the onset of precipitation; if the temporary trestles, falsework and gravel pad are anticipated to stay in place over the winter, these will be designed to withstand high flows and not allow construction materials to flow downstream (parts of the trestle will be removed if necessary).

- 2.2 **Nesting Birds.** It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by the FGC. No trees that contain active nests of birds shall be disturbed until all eggs have hatched and young birds have fledged without prior consultation and approval of a Department representative. If construction is scheduled during the breeding season (approximately March 1 to August 31) then Permittee shall conduct a breeding bird survey no more than 15 days prior to the start of construction by a Department approved biologist. The survey shall be conducted within the extension of the ESL as shown in Figure 2. All active bird nests will be marked following the survey to avoid destruction by equipment. If nesting raptors or migratory birds are identified within the area, a non-disturbance buffer will be established around the nest site. The size of the non-disturbance buffer and any other restrictions will be determined, before project activities commence, through consultation with the Department following completion of the survey.

If a lapse in project-related work of fifteen (15) calendar days or longer occurs, another focused survey and consultation with the Department shall be required before project work can be reinitiated.

- 2.3 **Bat Surveys.** Prior to the start of construction and at the appropriate time of the year, a qualified biologist shall survey each structure and the surrounding area that may be impacted by the project for bats. The results of the survey shall be submitted to the Department before the start of work.

- 2.4 **Bridge-dwelling Wildlife Protection.** Permittee shall comply with the following bridge-dwelling wildlife protection measures if a maternal colony (day roosting) is detected. All contractors, subcontractors, and employees shall also comply with these measures and it shall be the responsibility of Permittee to ensure compliance.

- 2.4.1 A qualified biologist shall design and direct implementation of exclusionary devices designed to prevent birds and bats from utilizing bridges/culverts before construction activities begin. Exclusionary devices shall be installed on all bridges prior to the initiation of nesting season (February 1).

Exclusionary devices shall cover both the sides and bottom of each bridge. Passage underneath each bridge (through the channel) shall not be impeded. Exclusionary materials shall be installed within seven (7) days of surveying the bridge for bridge-dwelling wildlife, shall not pose an entanglement risk to wildlife, and shall be regularly maintained. Exclusionary materials shall not be installed if nesting bird activity is detected. If bats are found using any bridge, roost entrances shall be fitted with one-way doors that allow bats to exit but prevent entrance for a period of several days to encourage bats to relocate.

- 2.4.2 No gasoline or diesel engines shall be stored or operated under any bridge unless the bridge has been cleared of all bats.
- 2.4.3 If a maternal colony (day roosting) is detected, construction activities on, under, or around, or within close proximity to bridges/culverts will be limited to October 1 to March 1, unless all bats have been excluded from the structure and concurrence has been received from the Department.
- 2.5 **Water Diversion Plan.** If flowing water is present or reasonably anticipated, the Permittee shall submit for approval a detailed water diversion and/or dewatering plan to the Department no later than 10 days prior commencing construction activities. Dewatering structures may include the use of gravel-filled bags, Port-a-dams, water bladder dams, K-rails or driven sheet metal coffer dams. The Department will review the proposed water diversion method, to approve the plan or provide the requirements for that approval. The Permittee may not commence the dewatering of the stream and/or the diversion of water without the explicit approval from the Department. This condition does not allow for the take or disturbance of any State or federally listed species, or State-listed species of special concern. A qualified biologist supplied by the Permittee, shall be onsite during installation, maintenance and removal of all dewatering or water diversion structures.
- 2.6 **Maintain Aquatic Life.** When any dam or other artificial obstruction is being constructed, maintained, or placed in operation, Permittee shall allow sufficient water at all times to pass downstream to maintain aquatic life below the dam pursuant to FGC §5937.
- 2.7 **Best Management Practices.** Permittee shall actively implement best management practices (BMPs) to prevent erosion and the discharge of sediment in to streams and lakes during project activities. BMPs shall be monitored daily and repaired if necessary to ensure maximum erosion and sediment control. Only certified weed-free materials shall be used in BMP applications. Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Non-welded weaves reduce entanglement risks to wildlife by allowing animals to push through the weave, which expands when spread. Products with

plastic monofilament or cross joints in the netting that are bound/stitched (such as found in straw wattles/fiber rolls and some erosion control blankets) which may cause entrapment of wildlife, shall not be allowed.

2.8 Pollution and Litter. Permittee shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws and it shall be the responsibility of Permittee to ensure compliance.

2.8.1 Permittee shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter a lake, streambed, or flowing stream or be placed in locations that may be subjected to high storm flows.

2.8.2 Spoil sites shall not be located within a lake, streambed, or flowing stream or locations that may be subjected to high storm flows, where spoil shall be washed back into a lake, streambed, or flowing stream where it will impact streambed habitat and aquatic or riparian vegetation.

2.8.3 Raw cement/concrete or washings thereof, asphalt, paint, or other coating material, oil or other petroleum products, or any other substances which could be hazardous to fish and wildlife resources resulting from project related activities shall be prevented from contaminating the soil and/or entering the waters of the State. These materials, placed within or where they may enter a lake, streambed, or flowing stream by Permittee or any party working under contract or with the permission of Permittee, shall be removed immediately.

2.8.4 No broken concrete, cement, debris, soil, silt, sand, bark, slash, sawdust, rubbish, or washings thereof, oil or petroleum products, or other organic or earthen material from any 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. No rubbish shall be deposited within 100 feet of the high water mark of any lake, streambed, or flowing stream.

2.8.5 No equipment maintenance or fueling shall be done within or near any lake, streambed, or flowing stream where petroleum products or other pollutants from the equipment may enter these areas under any flow. If it is not feasible to move equipment for fueling or maintenance, permittee shall implement a plan and executed by the Resident Engineer. The plan shall include controls to be used to perform fueling and maintenance and shall be approved by the RE prior to implementation.

2.9 Operating Equipment and Vehicle Leaks. Any equipment or vehicles driven and/or operated within or adjacent to the stream shall be checked and maintained daily to

prevent leaks of materials that could be deleterious to aquatic and terrestrial life or riparian habitat.

- 2.10 **Stationary Equipment Leaks.** Stationary equipment such as motors, pumps, generators, and welders, located within or adjacent to the stream shall be positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill/leak.
- 2.11 **Staging and Storage Areas.** Staging and storage areas for equipment, materials, fuels, lubricants, and solvents shall be located more than one hundred (100) feet from the stream channel and banks. All equipment and fuel stored on site shall be bermed to contain any spilled material and shall be protected from rain. Berms shall consist of plastic covered dirt or gravel-filled bags.
- 2.12 **Leave Wildlife Unharmd.** If any wildlife is encountered during the course of construction, said wildlife shall be allowed to leave the construction area unharmed. If any listed wildlife is encountered, the Permittee shall contact the Department immediately or proceed as described in the Incidental Take Permit for the project.
- 2.13 **Stabilized Areas with Soil.** Soils exposed by project operations shall be treated to prevent sediment run-off and transport. Erosion control measures shall include the proper installation of BMPs and may include applications of seed, certified weed free straw, compost, fiber, commercial fertilizer, stabilizing emulsion mulch, or combinations thereof. Following construction all disturbed upland areas shall be stabilized and re-seeded with an erosion control mix consisting of regionally appropriate, native grass and forb species. Revegetation of such sites shall be completed as soon as possible after project activities in those areas cease.

3 Reporting Measures

Permittee shall meet each reporting requirement described below.

- 3.1 **Notification of Project Initiation.** The Permittee shall notify the Department two (2) working days prior to beginning work within any of the ephemeral streams. Notification shall be submitted as instructed in Contact Information section below. Email notification is preferred.
- 3.2 **Notification of Project Completion.** Upon completion of the project activities described in this agreement, the project activities within the watercourse work area shall be digitally photographed. Photographs shall be submitted to the Department within fifteen (15) days of completion. Photographs and project commencement notification shall be submitted as instructed in Contact Information section below. Email submittal is preferred.

CONTACT INFORMATION

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

To Permittee:

California Department of Transportation
Deena Matagulay
1031 Butte Street
Redding, CA 96001
Phone: 530-225-3439
Email: deena.matagulay@dot.ca.gov

Contact person:

Rosalie Wilson
1031 Butte Street
Redding, CA 96001
Phone: 530-225-3296
Email: rosalie.wilson@dot.ca.gov

To The Department:

Department of Fish and Wildlife
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
Attn: Lake and Streambed Alteration Program
Notification #: 1600-2015-0200-R2
Phone: 916-358-2885
Email: R2LSA@wildlife.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 the Department'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

The Department 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 the Department 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 the Department 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 the Department to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes the Department 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 the Department'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

The Department may amend the Agreement at any time during its term if the Department 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 the Department and Permittee. To request an amendment, Permittee shall submit to the Department a completed Department "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in the Department'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 the Department 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 the Department a completed Department "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in the Department'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 the Department a completed Department "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in the Department's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). The Department 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 (FGC § 1605, subd. (f)).

EFFECTIVE DATE

The Agreement becomes effective on the date of the Department's signature, which shall be: 1) after Permittee's signature; 2) after the Department complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3)

after payment of the applicable FGC section 711.4 filing fee listed at http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire **December 31, 2018**, 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.

EXHIBITS

The documents listed below are included as exhibits to the Agreement and incorporated herein by reference.

- A. Figure 1 – Project Location
- Figure 2 – Project Footprint

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 the Department in accordance with FGC section 1602.

CONCURRENCE

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

FOR PERMITTEE



Deena Matagulay
Project Manager

2-11-16

Date

FOR DEPARTMENT OF FISH AND WILDLIFE



Tina Bartlett
Regional Manager

2/17/16

Date

Prepared by: Juan Lopez Torres
Senior Environmental Scientist (Specialist)

Exhibit A Figure 1 – Project Location

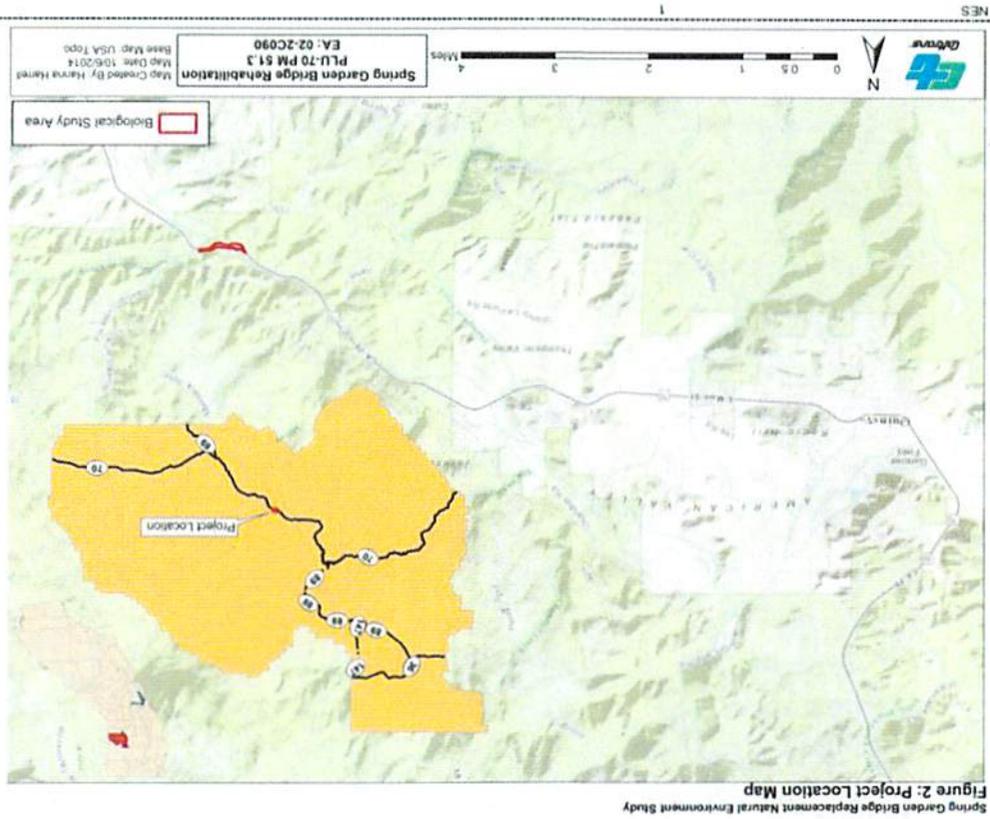
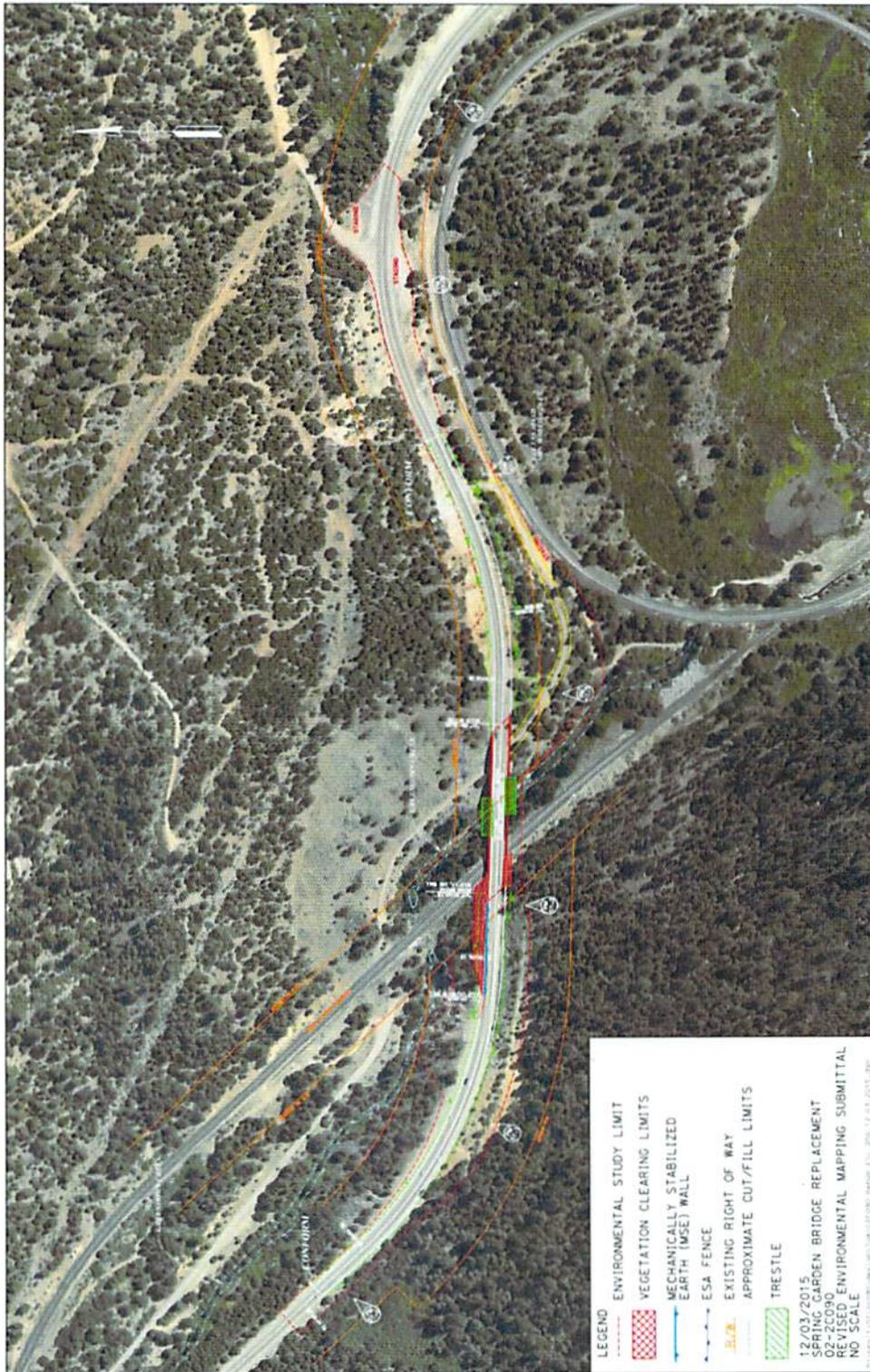


Figure 2 – Project Footprint



Memorandum

*Serious drought.
Help save water!*

To: JULIE MCFALL
ASSOCIATE ENVIRONMENTAL PLANNER

Date: July 12, 2016

File: EA 02-2C090
EFIS 200000161
Spring Garden Bridge
Rehabilitation

From: ROSALIE WILSON
Associate Environmental Planner (Natural Sciences)

Subject: **2016 PRE-CONSTRUCTION BAT SURVEY RESULTS**

Caltrans biologists Rosie Wilson, Marla Despas, and Julie Owen performed an evening fly-out survey for bats at the Spring Garden bridge on June 29, 2016 to satisfy Condition 2.3 required by the California Department of Fish and Wildlife under Caltrans' Streambed Alteration Agreement #1600-2015-0200-R2 for the Spring Garden Bridge Rehabilitation project.

Methods

Bridge inspection methods generally followed the Seismic survey protocol, level 1 and 2 from Erikson *et al* 2002. As-built plans of the bridge were consulted prior to conducting a site visit to determine the layout of the bridge features such as bents, piers, and joints (Attachment 1). The biologists arrived at the bridge at 7:15 pm to allow time for daytime inspection before the 8:40pm sunset. The biologists visually inspected all sides of bridge, using floodlights and binoculars as needed, for signs of entry/exit points that may be used by bats for day and night roosting. The bridge and the surrounding lands were searched for other signs of bats such as guano, staining, dead bats, live bats, or vocalizations. This information was recorded on a Microchiroptera Bridge Survey Form (Erikson *et al* 2002) (Attachment 2). The biologists established three observation stations in the northeast, southeast and southwest quadrants of the bridge to observe any bat activity near the bridge (see photos in Attachment 3). Ultrasound detectors (Pettersson D240x) with sound recorders (Samson Zoom H2) were set up in the northeast and southwest quadrants to record any ultrasonic sounds emitted during the evening surveys. At 8:15 PM, sound recording began and the biologists started their fly-out survey from their respective stations. Each biologist recorded the location and nature of any observed bat activity near the bridge. The biologists stopped the surveys and ultrasonic recordings after dusk at approximately 10:00 PM.

Results

Caltrans biologists Marla Despas and Julie Owen observed a small amount of bat guano and staining that may be from bat urine at the base of the eastern bridge abutment (Abutment 8, see Attachment 1). No dead bats were observed nor were any live bats seen roosting on this end of the bridge. The biologists observed bats flying near the bridge beginning at approximately 9:00 PM; the bats were no longer visible after 9:45 PM. The bats observed in this area were not identified to species. Ultrasound data was collected at this end of the bridge but has not been processed or analyzed.

The western bridge abutment (Abutment 1) also showed guano and potential staining, but in larger amounts than the eastern Abutment 8. A sample of guano was collected from Abutment 1. No dead bats were observed nor were any live bats seen roosting on the Abutment 1. However, upon approaching the western bents of the bridge (Bents 2 and 3) over the railroad tracks at approximately 8:30 PM, Caltrans biologist Rosie Wilson noted bat vocalization or “chattering” on the southern end of the end diaphragms of Bent 3. At approximately 9:00 PM, Ms. Wilson observed bats flying into, out of and between the south end of Bents 2 and 3. A video of this activity is included in Attachment 4. The biologists observed this activity until they ended the survey at approximately 10:00 PM. The bats observed in this area were not identified to species. Ultrasound data collection was not successful at this location due to equipment failure.

Between 9:30 and 9:45 PM, the biologists watched for bat activity next to the Greenhorn Creek stream channel. No bats were observed over Greenhorn Creek during this survey.

Discussion

Based on the presence of staining and guano on the bridge structure, bats are likely using the eastern bents and both abutments of the Spring Garden bridge for night roosting. Based on the vocalization heard during daylight hours and the activity seen at Bents 2 and 3, bats are likely using these western bents for both day and night roosting. The species of bats observed using the bridge are unknown. If the ultrasound data collected on the eastern end of the bridge is analyzed it may shed light on which species are foraging in the vicinity. However, no data was collected during this survey that could verify which species of bats were observed using the end diaphragms of Bents 2 and 3 of the bridge.

Attachment(s)

- (1) 1989 Spring Garden Bridge As Built Plan
- (2) Microchiroptera Bridge Survey Form
- (3) Representative Photographs
- (4) Available upon request: Video of bat activity at Bent 3

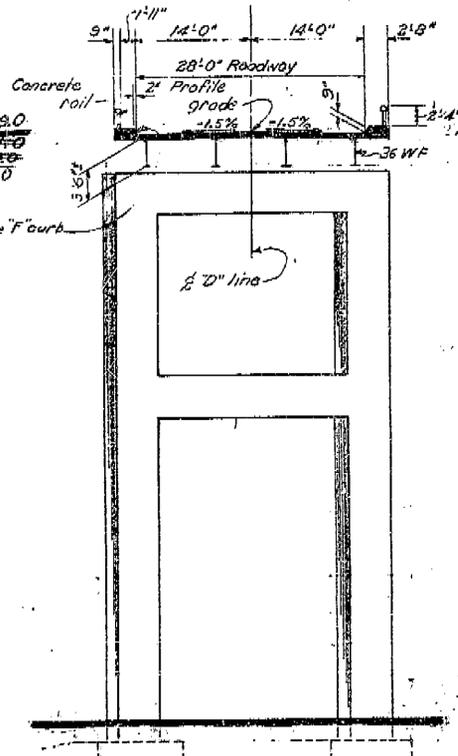
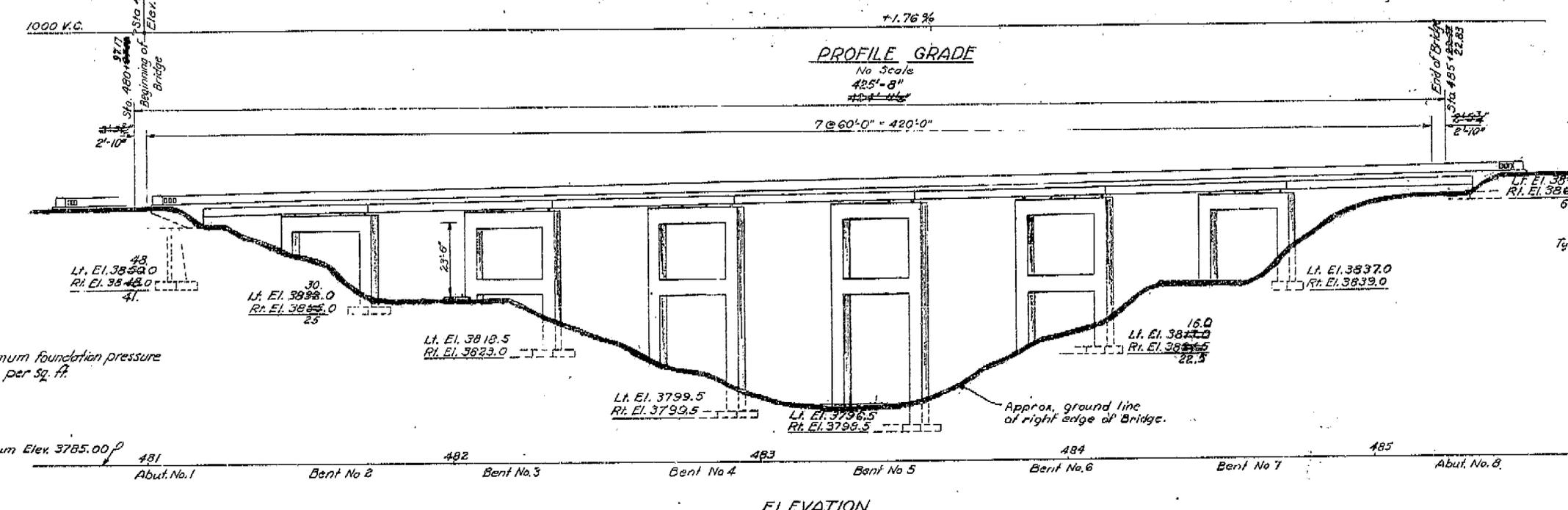
c: Juan Torres, Senior Environmental Scientist, California Department of Fish and Wildlife
Stacey Barnes, Project Manager, Caltrans
Linda Jones, Office Engineer, Caltrans

Literature Cited

Erickson, Gregg A., et al. Bat and Bridges Technical Bulletin (Hitchhiker Guide to Bat Roosts), California Department of Transportation, Sacramento CA. 2002.

DATE	DESIGN	DATE	REVISION	BY	INITIALS
	PL	5/2	0		

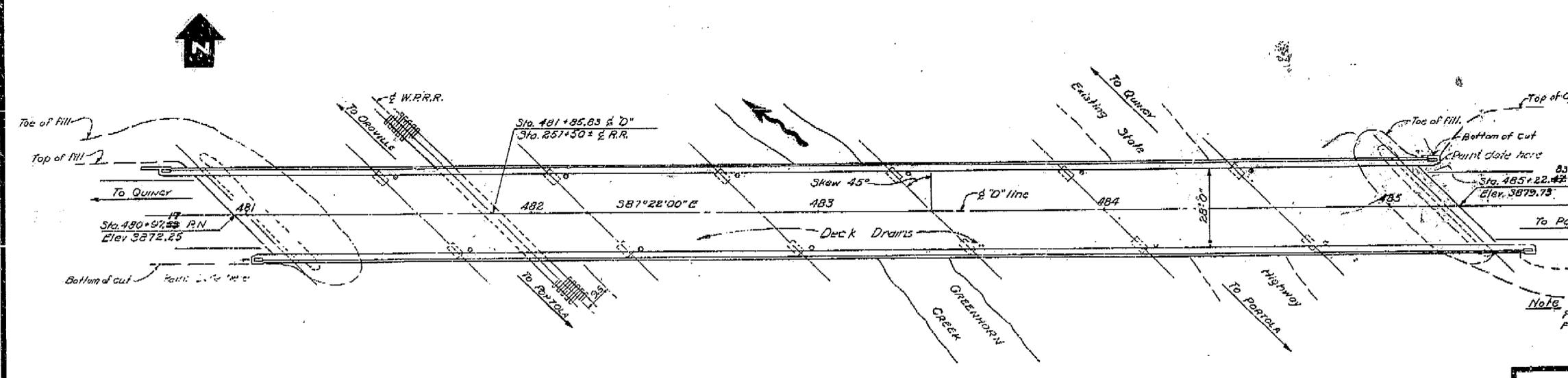
STATE HIGHWAY ENGINEER
CIVIL ENGINEER - LICENSE NO. 5312



ESTIMATE

Structure Excavation	1255.4	1255.4	Cu. Yds.
Class A Concrete	1214.42	1214.42	Cu. Yds.
Structural Steel - Low Alloy	306,300	306,300	Lbs.
Carbon	68,400	68,400	Lbs.
Drains & Guard Ls	1,650	1,650	Lbs.
Reinforcing Steel	778,238	778,238	Lbs.
Concrete Railing	887	887	Lbs.

Includes furnishing & placing reinforcement in railing.



CONTRACT PLANS
Contract No. _____
Document No. 20000 917

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

SPRING GARDEN BRIDGE & OVERHEAD
LOCATED 7.9 MILES SOUTHEAST OF QUINCY
IN PLUMAS COUNTY

GENERAL PLAN

1" = 20' On G.S.
SCALE noted

BRIDGE 9-62 FILE DRAWING 3318-1

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE 11/5/71 SIGNATURE [Signature] TITLE HAO II

BRIDGE DEPARTMENT



DATE	BY	REVISION
11/5/71	[Signature]	1

Construction Revisions:
Drawn by: L.S.P.
Checked by: W.P.

"AS BUILT" FROM BUREAU OF PUBLIC ROAD

6/29/16

- Sunset 8:30
- Recorder on ~~East~~ side
turned on at 8:15 pm
- Recorder set up on NE side of bridge
Approx 70' from bridge and 20'
below deck

Megachiroptera Bridge Survey Form

Surveyors: J. Owen R. Wilson
M. Despres
 Bridge Name: Spring Green
 Bridge Number: 09-62
 County/Route/PM: W-70-50.9
 Location (T/R/S): 24N/10E/25

Date/Time: 6/29/16 7:30pm-10pm
 Function/Feature Crossed: Railroad, creek
 Year Built: 1989 Last Mod: unknown
 Elevation (meters): 1180
 Lat: 39°54'42.13"N Long: 120°48'45.96"W
 UTM: Z N E

Span (meters): 128
 Width (meters): Approx 33
 Type (meters):

Centerline Orientation(deg): See 1989
 Feature Orientation(deg): As-Built
 Vertical Clearance(meters): min: 5.4
Max: 15.8

Bents/Rows: 0 + 2 Abutments
 # Girders: 4

Air Pockets: none
 # Exp. Joints: unknown

Air Temp. (°C):
 Roost Temp. (°C): ?
 Sub. Temp. (°C): ?
 Air Windspeed (Km/H): 0
no wind

Area Hab. Type: Dayhr forest
 Site Hab. Type: greenhry Crk + Riparian
 Disturbance Factors: railroad
 Roost Windspeed (Km/H): ?

Stain Length: 1.5ft
 Stain Type: urine
 Stain Location: Abt. 1
 # Air Pockets Used: ?

Guano Amount: 12-15 granules
 Guano Location: Abutment 8
 Guano Description: in a 1x15 space
 Guano Sample #: 1

Species Known: None

Species Likely: Myotis, Pipistrel, L. borealis
A. pallidus

Day Roost?: potentially Night Roost?: yes Other Roost?: Unknown
 Features Used: A crack at a butment on East side
 Site Significance: Had evidence of
 Recommendations and Notes: See Memo Pray processing - scattered
guano

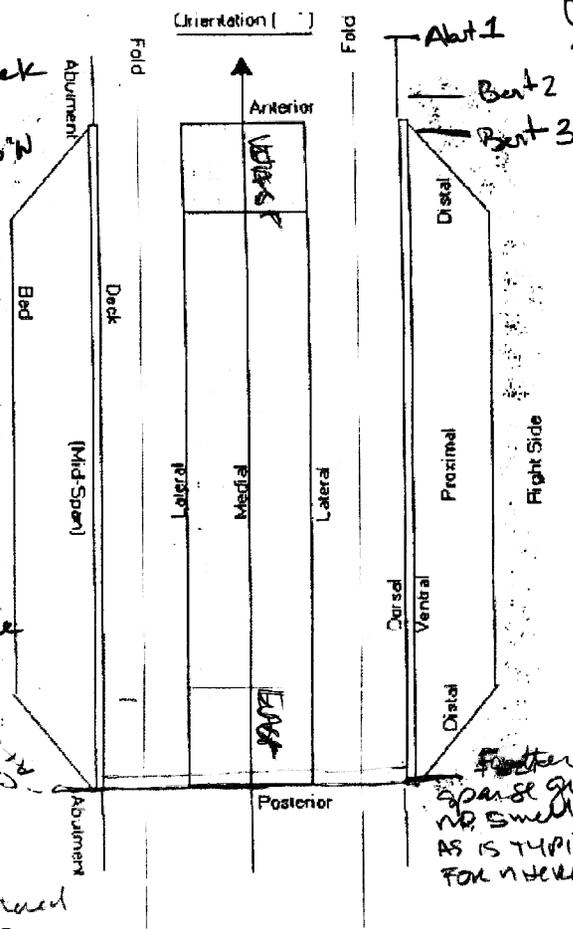
Bridge is on metal beams thus under
 side except for abutments has no
 cracks or cavities suitable for roosting

no smell of
 urine
 no noise of
 crevice roost

Bridge Typical, note locations, features, and sketch of bridge,
 including exp. joints, bents, piles and arches.

No cavities suitable for roosting
 on East side of bridge

Associated with material color



Chattering at these
 2 bents when R.W.
 arrived @ 7:45 am
 8:30

Feathered
 sparse guano
 no smell
 as is typical
 for this species
 Abt 8



Photo 1. Guano and probable bat urine staining on Abutment 1.



Photo 2. Sparse guano and possible urine staining at Abutment 8.



Photo 3. Bent 3 where bat vocalization was heard.



Photo 4. Ultrasonic detector setup on eastern end of bridge.

For Contract No. 02-2C0904

AGREEMENTS

Plumas National Forest Service Agreement

DEPARTMENT OF TRANSPORTATION

DISTRICT 2 – Right of Way Field Office

1031 Butte Street MS 35

Redding, CA 96001

PHONE (530) 225-2751

FAX (530) 225-3021

TTY (530) 225-2019

*Serious drought.
Help save water!*

February 29, 2016

02-Plu-70 PM 51.2

EA 2C090

Spring Garden

Tree Removal

Mr. Mike Donald
District Ranger
Mt. Hough Ranger District
39696 Highway 70
Quincy, CA 95971

Attn: Ms. Erika Brenzovich

Dear Mr. Donald:

Subject: Tree Removal Agreement

The California Department of Transportation (Caltrans) proposes to rehabilitate, seismically retrofit and widen the Spring Garden Bridge on Highway 70 in Plumas County. The bridges cross over the Union Pacific Railroad and Greenhorn Creek in Township 24 Range 10E Section 25, at Post Mile 51.2. In order to access underneath the bridge deck, the State's contractors will need to remove trees that are owned by Plumas National Forest.

The State's contractor will be required to contact Thomas Honeycutt with the Mt. Hough Ranger District, by telephone (530) 283-7649 or email- thomashoneycutt@fs.fed.us. The contractor will be required to buy a commercial fuel wood permit from the Mt. Hough Ranger District for \$10/cord, no more than 30 cords total. The trees will become the property of the contractor once they are paid for, and will be able to dispose of them how they see fit.

If you concur, please sign below indicating that you are in agreement with the terms of this letter. Please return a copy of this letter to me. If you need further information, please call me at (530) 225-2751.

Sincerely,

Handwritten signature of Kelly Babcock in black ink.

KELLY BABCOCK
USA Lands Liaison

I concur with the above-described timber removal

Acting
Pool Handwritten signature of Mike Donald in black ink.

Mike Donald
District Ranger, Mt. Hough Ranger District

3/1/16
Date

For Contract No. 02-2C0904

RAILROAD RELATIONS

Railroad Relations and Insurance Requirements

EXHIBIT D

Information Handout Document to Project Construction Contract Documents:

“RAILROAD RELATIONS AND INSURANCE REQUIREMENTS”

1.01 GENERAL

The term "Railroad" shall mean Union Pacific Railroad Company.

It is expected that the Railroad will cooperate with the Contractor to the end that the work may be handled in an efficient manner. However, except for the additional compensation provided for hereinafter for delays in completion of specific unit of work to be performed by the Railroad, and except as provided in Public Contracts Code Section 7102, the Contractor shall have no claim for damages, extension of time, or extra compensation in the event his work is held up by railroad train operations or other work performed by the Railroad.

The Contractor must understand the Contractor's right to enter the Railroad's property is subject to the absolute right of the Railroad to cause the Contractor's work on the Railroad's property to cease if, in the opinion of the Railroad, the Contractor's activities create a hazard to the Railroad's property, employees, and operations.

The Contractor acknowledges its receipt from the State of a copy of the Contractor's Right of Entry Agreement that has been executed by the Railroad and the State. The Contractor agrees to execute and deliver to the Railroad the Contractor's Endorsement that is attached hereto as Appendix 1 and to provide to the State and/or the Railroad all insurance policies, binders, certificates or endorsements that are set forth in Exhibits B and C of the Caltrans Right of Entry Agreement.

1.02 RAILROAD REQUIREMENTS

The Contractor shall provide to Mr. Kevin Yoder, Railroads Manager, Industry and Public Projects, 9451 Atkinson Boulevard, Roseville, California 95747, (916) 789-5054, and State's Resident Engineer (Engineer) in writing, the advance notice requirements set forth in Section 1 of **Exhibit B** of the Caltrans Right of Entry Agreement before performing any work on, or adjacent to the property or tracks of the Railroad.

Contractor shall cooperate with the Railroad where work is over or under the tracks, or within the limits of the Railroad property to expedite the work and avoid interference with the operation of railroad equipment.

Contractor shall comply with the rules and regulations of the Railroad or the instructions of its representatives in relation to protecting the tracks and property of the Railroad and the traffic moving on such tracks, as well as the wires, signals and other property of the Railroad, its tenants or licensees, at and in the vicinity of the work during

the period of construction. The responsibility of the Contractor for safe conduct and adequate policing and supervision of its work at the job site shall not be lessened or otherwise affected by the presence at the work site of the Railroad representatives, or by the Contractor's compliance with any requests or recommendations made by the Railroad representatives.

Contractor shall perform work so as not to endanger or interfere with the safe operation of the tracks and property of the Railroad and traffic moving on such tracks, as well as wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the work.

Contractor shall take protective measures to keep the Railroad facilities, including track ballast, free of sand or debris resulting from his operations. Damage to the Railroad facilities resulting from the Contractor's operations will be repaired or replaced by the Railroad and the cost of such repairs or replacement shall be deducted from the Contractor's progress and final pay estimates.

Contractor shall contact the Railroad's "Call Before You Dig" at least forty-eight (48) hours prior to commencing work, at 1-800-336-9193 during normal business hours (7:00 a.m. to 9:00 p.m. Central Time, Monday through Friday, except holidays – also a 24-hour, 7-day number for emergency calls) to determine location of fiber optics. If a telecommunications system is buried anywhere on or near the Railroad property, the Contractor will coordinate with the Railroad and the Telecommunication Company (ies) to arrange for relocation or other protection of the system prior to beginning any work on or near Railroad property.

Contractor shall not pile or store any materials nor park any equipment closer than 25'-0" to the centerline of the nearest track, unless directed by the Railroad's representative.

Contractor shall also abide by the following temporary clearances during the course of construction:

- 12'-0" horizontally from centerline of track
- 21'-6" vertically above top of rail

The temporary vertical construction clearance above provided will not be permitted until authorized by the California Public Utilities Commission. It is anticipated that authorization will be received not later than fifteen (15) days after the approval of the highway contract by the Attorney General. In the event authorization is not received by the time specified, and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of authorization not being received by the said time, the Licensee will compensate the Contractor for such delay to the extent provided in Section 8-1.07, "Delays," of the 2010 Standard Specifications and not otherwise.

Walkways with railing shall be constructed by the Contractor over open excavation areas when in close proximity of tracks, and railings shall not be closer than 8'-6" horizontally from centerline of the nearest track, if tangent, or 9'-6" if curved.

Infringement on the above temporary construction clearances by the Contractor's operations shall be submitted to the Railroad by the Engineer, and shall not be undertaken until approved by the Railroad, and until the Engineer has obtained any necessary authorization from any governmental body or bodies having jurisdiction there-over. No extension of time or extra compensation will be allowed in the event the Contractor's work is delayed pending Railroad approval and governmental authorization.

When the temporary vertical clearance is less than 22'-6" above top of rail, the Railroad shall have the option of installing tell-tales or other protective devices the Railroad deems necessary for protection of the Railroad trainmen or rail traffic.

Four (4) sets of plans, in 11" x 17" format, and two (2) sets of calculations showing details of construction affecting the Railroad's tracks and property not included in the contract plans, including but not limited to shoring and falsework, shall be submitted to the Engineer for review prior to submittal to the Railroad for final approval. At Railroad's option, these plans and calculations may be submitted electronically via email or be mailed with appropriate CD or DVD disk. Falsework shall comply with the Railroad guidelines. Demolition of existing structures shall comply with the Railroad guidelines. Shoring shall be designed in accordance with the Railroad's shoring requirement of UPRR Drawing No. 106613 and guidelines for shoring and falsework, latest edition, issued by the Railroad's Office of Chief Engineer. Shoring and falsework plans and calculations shall be prepared and signed by a professional engineer registered in California. This work shall not be undertaken until such time as the Railroad has given such approval, review by the Railroad may take up to six (6) weeks after receipt of necessary information.

Contractor shall notify the Engineer in writing, at least twenty-five (25) calendar days but not more than forty (40) days in advance of the starting date of installing temporary work with less than permanent clearance at each structure site. The Contractor shall not be permitted to proceed with work across railroad tracks until this requirement has been met. No extension of time or extra compensation will be allowed if the Contractor's work is delayed due to failure to comply with the requirements in this paragraph.

Blasting will be permitted only when approved by the Railroad.

Contractor shall, upon completion of the work covered by this Contract to be performed by the Contractor upon the premises or over or beneath the tracks of the Railroad, promptly remove from the premises of the Railroad, the Contractor's tools, implements and other materials, whether brought upon said premises and cause said premises to be left in a clean and presentable condition.

Under track pipeline installations (if required) shall be constructed in accordance with the Railroad's current standards that may be obtained from the Railroad. The general guidelines are as follows:

Edges of jacking or boring pit excavations shall be a minimum of 25 feet from the centerline of the nearest track.

If the pipe to be installed under the track is 4 inches in diameter or less, the top of the pipe shall be at least 42 inches below base of rail.

If the pipe diameter is greater than 4 inches in diameter, it shall be encased and the top of the steel pipe casing shall be at least 66 inches below base of rail.

Installation of pipe or conduit under the Railroad's tracks shall be done by dry bore and jack method.

Hydraulic jacking or boring will not be permitted.

Safety of personnel, property, rail operations and the public is of paramount importance. As reinforcement and in furtherance of overall safety measures to be observed by the Contractor (and not by way of limitation), the following special safety rules shall be followed:

- (a) Contractor shall keep the job site free from safety and health hazards and ensure that its employees are competent and adequately trained in all safety and health aspects of the job. Contractor shall have proper first aid supplies available on the job site so that prompt first aid services can be provided to any person that may be injured on the job site. Contractor shall promptly notify the Railroad of any U.S. Occupational Safety and Health Administration reportable injuries occurring to any person that may arise during the work performed on the job site. Contractor shall have a non-delegable duty to control its employees while they are on the job site or any other property of the Railroad to be certain they do not use, be under the influence of, or have in their possession any alcoholic beverage, drug, narcotic or other substance that may inhibit the safe performance of work by the employee.
- (b) Employees of the Contractor shall be suitably dressed to perform their duties safely and in a manner that will not interfere with their vision, hearing or free use of their hands or feet. Only waist length shirts with sleeves and trousers that cover the entire leg are to be worn. If flare-legged trousers are worn, the trouser bottoms must be tied to prevent catching. Employees should wear sturdy and protective work boots and at least the following protective equipment:
 - (1) Protective headgear that meets American National Standard-Z89.1-latest revision. It is suggested that all hardhats be affixed with the Contractor's or the subcontractor's company logo or name.
 - (2) Eye protection that meets American National Standard for occupational and educational eye and face protection, Z87.1-latest revision. Additional eye protection must be provided to meet specific job situations such as welding, grinding, burning, etc.; and
 - (3) Hearing protection that affords enough attenuation to give protection from noise levels that will be occurring on the job site.
- (c) All heavy equipment provided or leased by the Contractor shall be equipped with audible back-up warning devices. If in the opinion of the Railroad Representative

any of the Contractor's or the subcontractor's equipment is unsafe for use on the Railroad's right-of-way, the Contractor, at the request of the Railroad representative, shall remove such equipment from the Railroad's right-of-way.

1.03 PROTECTION OF RAILROAD FACILITIES

Upon the advance notification provided to the Railroad as set forth in Section 1 of Exhibit B of the Contractor's Right of Entry Agreement, the Railroad representatives, conductors, flagmen or watchmen will be provided by the Railroad to protect its facilities, property and movements of its trains or engines. Notice shall be made to the Railroad's Manager of Track Maintenance at **(530) 235-0300, ext. 5080**. At the time of notification, the Contractor shall provide the Railroad with a schedule of dates that flagging services will be needed, as well as times, if outside normal working hours. Subsequent deviation from the schedule shall require ten (10) working days' advance notice from the first affected date. The Railroad will furnish such personnel or other protective devices:

- (a) When equipment is standing or being operated within 25 feet, measured horizontally, from centerline of any track on which trains may operate, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
- (b) For any excavation below elevation of track subgrade if, in the opinion of the Railroad's representative, track or other Railroad facilities may be subject to settlement or movement.
- (c) During any clearing, grubbing, grading or blasting in proximity to the Railroad which, in the opinion of the Railroad's representative, may endanger the Railroad facilities or operations.
- (d) During any of the Contractor's operations when, in the opinion of the Railroad's representatives, the Railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines or pipe lines, may be endangered.

The cost of flagging and inspection provided by the Railroad during the period of constructing that portion of the project located on or near the Railroad property, as deemed necessary for the protection of the Railroad's facilities and trains, will be borne by the State. The Railroad has indicated that its estimated flagging rate will be around One Thousand Three Hundred Dollars (\$1,300.00) per day and that the State has estimated a total of one hundred and sixty (160) days of flagging. The State shall pay the Railroad for all actual flagging costs incurred by the Railroad under this Project.

1.04 WORK BY RAILROAD

The following work by the Railroad will be performed by Railroad forces and is not a part of the work under this Contract.

- (a) Railroad will perform preliminary engineering and inspection (if any) construction inspection, plan change review (if any) and falsework plan review and flagging as

specified in Section 1.03 "Protection of Railroad Facilities," of these special provisions.

- (b) Temporary crossings at grade over tracks of Railroad for the purpose of hauling earth, rock, paving or other materials will require approval by railroad in advance. If the Contractor, for the purpose of constructing highway-railway grade separation structures, including construction ramps thereto, desires to move equipment or materials across Railroad's tracks, the Contractor shall first obtain permission from Railroad (at possible additional cost) via the State Engineer. Should Railroad approve the temporary crossings, State shall execute a Service Contract with Railroad for Railroad to construct the temporary crossing. Under the Service Contract, State shall bear the cost of the crossing surface, warning devices and other components that might be required. Notwithstanding State's Service Contract with Railroad, the Contractor is required to execute Railroad's form of Contractor's Haul Road Crossing Agreement. Railroad, at State's expense, shall provide flagmen to control movements of vehicles across the temporary crossing. State and its Contractor shall prevent the use of such temporary crossing by unauthorized persons and vehicles.

1.05 DELAYS DUE TO WORK BY RAILROAD.

If delays due to work by the Railroad occur, and the Contractor sustains loss which, in the opinion of the Engineer, could not have been avoided by the judicious handling of forces, equipment and plant, the amount of said loss shall be determined as provided in Section 8-1.07, "Delays," of the 2010 Standard Specifications.

If a delay due to work by the Railroad occurs, an extension of time determined pursuant to the provisions in Section 8-1.10, "Liquidated Damages," of the 2010 Standard Specifications will be granted.

1.06 LEGAL RELATIONS

The provisions of Section 1, "Relations with Railroad Company," and the provisions of Section 2, "Railroad Protective Insurance," of these special provisions shall inure directly to the benefit of the Railroad.

2.0 INSURANCE AND ENDORSEMENTS

In addition to any other form of insurance or bonds required under the terms of the contract and specifications, the Contractor will be required to carry insurance of the kinds and in the amounts hereinafter specified.

Such insurance shall be approved by the Railroad before any work is performed on the Railroad's property and shall be carried until all work required to be performed on or adjacent to the Railroad's property under the terms of the contract is satisfactorily completed as determined by the Engineer, and thereafter until all tools, equipment and materials have been removed from the Railroad's property and such property is left in a clean and presentable condition.

Full compensation for all premiums which the Contractor is required to pay on all the insurance described hereinafter shall be considered as included in the prices paid for the various items of work to be performed under the contract, and no additional allowance will be made thereof or for additional premiums which may be required by extensions of the policies of insurance.

The following insurance coverage will be required:

- A. **Commercial General Liability** insurance. Commercial general liability (CGL) with a limit of not less than \$5,000,000 each occurrence and an aggregate limit of not less than \$10,000,000. CGL insurance must be written on ISO occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage).

The policy must also contain the following endorsement, which must be stated on the certificate of insurance:

- Contractual Liability Railroads ISO form CG 24 17 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Railroad Company Property" as the Designated Job Site.

- B. **Business Automobile Coverage** insurance. Business auto coverage written on ISO form CA 00 01 (or a substitute form providing equivalent liability coverage) with a combined single limit of not less \$5,000,000 for each accident. The policy must contain the following endorsements, which must be stated on the certificate of insurance:

- Coverage For Certain Operations In Connection With Railroads ISO form CA 20 70 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Property" as the Designated Job Site.
- Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90) if required by law.

- C. **Workers' Compensation and Employers' Liability** insurance. Coverage must include but not be limited to:

- Contractor's statutory liability under the workers' compensation laws of the State of California.
- Employers' Liability (Part B) with limits of at least \$500,000 each accident, \$500,000 disease policy limit \$500,000 each employee.

If Contractor is self-insured, evidence of state approval and excess workers compensation coverage must be provided. Coverage must include liability arising out of the U. S. Longshoremen's and Harbor Workers' Act, the Jones Act, and the Outer Continental Shelf Land Act, if applicable.

The policy must contain the following endorsement, which must be stated on the certificate of insurance:

- Alternate Employer endorsement ISO form WC 00 03 01 A (or a substitute form providing equivalent coverage) showing Railroad in the schedule as the alternate employer (or a substitute form providing equivalent coverage).

- D. Railroad Protective Liability Insurance.** Contractor must maintain Railroad Protective Liability insurance written on ISO occurrence form CG 00 35 12 04 (or a substitute form providing equivalent coverage) on behalf of Railroad as named insured, with a limit of not less than \$2,000,000 per occurrence and an aggregate of \$6,000,000. A binder stating the policy is in place must be submitted to Railroad before the work may be commenced and until the original policy is forwarded to Railroad.
- E. Umbrella or Excess insurance.** If Contractor utilizes umbrella or excess policies, these policies must “follow form” and afford no less coverage than the primary policy.
- F. Pollution Liability insurance.** Pollution liability coverage must be written on ISO form Pollution Liability Coverage Form Designated Sites CG 00 39 12 04 (or a substitute form providing equivalent liability coverage), with limits of at least \$5,000,000 per occurrence and an aggregate limit of \$10,000,000.

If the scope of work as defined in this Agreement includes the disposal of any hazardous or non-hazardous materials from the job site, Contractor must furnish to Railroad evidence of pollution legal liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting the materials, with coverage in minimum amounts of \$1,000,000 per loss, and an annual aggregate of \$2,000,000.

Other Requirements

- G.** All policy(ies) required above (except worker’s compensation and employers liability) must include Railroad as “Additional Insured” using ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage). The coverage provided to Railroad as additional insured shall, to the extent provided under ISO Additional Insured Endorsement CG 20 26, and CA 20 48 provide coverage for Railroad’s negligence whether sole or partial, active or passive, and shall not be limited by Contractor’s liability under the indemnity provisions of this Agreement.
- H.** Before Contractor commences any work, the Contractor shall, except to the extent prohibited by law; (1) require each of its subcontractors to include the Contractor as "Additional Insured" in the subcontractor's Commercial Liability policy and Business Automobile policies with respect to all liabilities arising out of the subcontractor's performance of work on behalf of the Contractor by endorsing these policies with ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage; (2) require each of its subcontractors to endorse their Commercial General Liability Policy with "Contractual Liability Railroads" ISO Form CG 24 17 10 01 (or a substitute form providing equivalent coverage) for the job site; and (3) require each of its subcontractors to endorse their Business Automobile Policy with "Coverage for Certain Operations In Connection With Railroads" ISO Form CA 20 70 10 01 (or a substitute form providing equivalent coverage) for the job site.

- I.** Punitive damages exclusion, if any, must be deleted (and the deletion indicated on the certificate of insurance), unless the law governing this Agreement prohibits all punitive damages that might arise under this Agreement.
- J.** Contractor waives all rights of recovery, and its insurers also waive all rights of subrogation of damages against Railroad and its agents, officers, directors and employees. This waiver must be stated on the certificate of insurance.
- K.** Prior to commencing the work, Contractor shall furnish Railroad with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements in this Agreement.
- L.** All insurance policies must be written by a reputable insurance company acceptable to Railroad or with a current Best's Insurance Guide Rating of A- and Class VII or better, and authorized to do business in the State of California.
- M.** The fact that insurance is obtained by Contractor or by Railroad on behalf of Contractor will not be deemed to release or diminish the liability of Contractor, including, without limitation, liability under the indemnity provisions of this Agreement. Damages recoverable by Railroad from Contractor or any third party will not be limited by the amount of the required insurance coverage.

APPENDIX 1

CONTRACTOR'S ENDORSEMENT

A. As a condition to entering upon the Railroad's right-of-way to perform Work pursuant

to this agreement, State's contractor, _____
(Name of Contractor)

whose address is _____,
(Contractor's Mailing Address)

(hereinafter "Contractor"), agrees to comply with and be bound by all the terms and provisions of the attached Caltrans Right of Entry Agreement that was signed by Union Pacific Railroad Company ("Railroad") and the State of California, Department of Transportation ("State") relating to the Work to be performed and the insurance requirements set forth in Exhibits B and C of the Right of Entry Agreement. The Contractor further acknowledges and agrees that the reference to Cal. Gov. Code §14662.5 in Sections 5.b) and 8.b) of Exhibit B to the Right of Entry Agreement does not apply to the Contractor and in no way limits the indemnities set forth in those provisions, to which the Contractor agrees to be bound.

B. Before the Contractor commences any Work, the Contractor will provide the Railroad with (i) a binder of insurance for the Railroad Protective Liability Insurance described in Section 2 of the Contract Special Provisions, hereto attached, and the original policy, or a certified duplicate original policy when available, and (ii) a certificate issued by its insurance carrier providing the other insurance coverage and endorsements required pursuant to Section 2 of the Contract Special Provisions.

C. All insurance correspondence, binders or originals shall be directed to:

Union Pacific Railroad Company
Attn: Real Estate Department
1400 Douglas Street, MS 1690
Omaha, Nebraska
Attn.: Senior Manager-Contracts
Folder No. 2800-64

D. Please note that fiber optic cable may be buried on the Railroad's property. **Prior to commencing any work, the Contractor agrees to contact the Railroad's Telecommunications Operation Center as provided in Section 5 of Exhibit A of the Right of Entry Agreement to determine if any fiber optic cable is located on the Railroad's property on or near the location where the work is to be performed.** If there is, the Contractor must comply with the terms and conditions of Section 5 of Exhibit A before commencing any work on the Railroad's property.

E. **The Contractor agrees to also provide to the Railroad's Manager-Track Maintenance at (530) 235-0300, ext. 5080, the advance notice required in Section 1 of Exhibit B of the Right of Entry Agreement prior to working on the Railroad's property in**

order for the Railroad to coordinate the Contractor's work with the Railroad's operations and to make arrangements for flagging protection (if applicable).

This endorsement shall be completed and sent to the person named in Paragraph C above.

(Name of Contractor)

By _____

Title: _____

Date: _____

EXHIBIT E

Information Handout Document to Project Construction Contract Documents:

UNION PACIFIC RAILROAD MINIMUM REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

This project includes construction work within the Right-of-Way and/or properties of the Union Pacific Railroad "UPRR" and adjacent to tracks, wire lines and other facilities. This section describes the special requirements for coordination with railroad when work by the Contractor will be performed upon, over or under the railroad right-of-way or may impact current or future railroad operations. The Contractor will coordinate with railroad while performing the work outlined in this Contract, and shall afford the same cooperation with railroad as it does with the Agency. All submittals and work shall be completed in accordance with:

- UPRR Guidelines,
- Joint BNSF Railway – Union Pacific Railroad Guidelines for Railroad Grade Separation Projects:
(http://www.uprr.com/aboutup/operations/specs/attachments/grade_separation.pdf), and
- AREMA recommendations as modified by these minimum special requirements or as directed in writing by the UPRR Designated Representative.

For purposes of this project, the UPRR Designated Representative shall be the person or persons designated by the UPRR Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 DEFINITION OF AGENCY AND CONTRACTOR

As used in these railroad requirements, the term "Agency" shall mean the State of California, by and through its Department of Transportation.

As used in these railroad requirements, the term "Contractor" shall mean the contractor or contractor's hired by the Agency to perform any project work on any portion of railroad's property and shall also include the contractor's subcontractors and the contractor's and subcontractor's respective officer, agents and employees, and others acting under its or their authority.

1.03 UPRR CONTACTS

The primary point of contact for this project is:

Mr. Kevin Yoder
Manager Industry and Public Projects
Union Pacific Railroad Company
9451 Atkinson Street
Roseville, CA 95747
Phone: (916) 789-5152
E-mail: kayoder@up.com

For UPRR railroad flagging services and track work, contact:

Craig J. Miller
Manager of Track Maintenance
Union Pacific Railroad
2985 South 5th
Oroville, CA 95965
Work Phone: (530) 532-6230
Cell Phone: (916) 517-8168

1.04 REQUEST FOR INFORMATION / CLARIFICATION

All Requests for Information ("RFI") involving work within any railroad right-of-way shall be in accordance with the procedures listed elsewhere in these bid documents. All RFI's shall be submitted to the Engineer of Record. The Engineer of Record will submit the RFI to the Railroad Designated Representative for review and approval for corresponding to work within the railroad right-of-way. The Contractor shall allow four (4) weeks for the review and approval process by railroad.

1.05 PLANS / SPECIFICATIONS

The plans and specifications for this project, affecting the railroad, are subject to the written approval by the railroad and changes in the plans may be required after award of the Contract. Such changes are subject to the approval of the Agency and Railroad.

PART 2 – UTILITIES AND FIBER OPTIC

2.01 UTILITIES AND FIBER OPTIC

All installations shall be constructed in accordance with current AREMA recommendations and railroad specifications and requirements. UPRR general guidelines and the required application forms for utility installations can be found on the UPRR website at www.uprr.com.

3.01 GENERAL

A. Contractor shall perform all work in compliance with all applicable Railroad and FRA rules and regulations. Contractor shall arrange and conduct all work in such manner and at such times as shall not endanger or interfere with

the safe operation of the tracks and property of railroad and the traffic moving on such tracks, or the wires, signals and other property of railroad, its tenants or licensees, at or in the vicinity of the work. Railroad shall be reimbursed by Contractor or Agency for train delay costs and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction work or other activities.

- B. Construction activities will be permitted within 12 feet of the centerline of operational tracks only if absolutely necessary and Railroad's Designated Representative grants approval. Construction activities within 12 feet of the operational track(s) must allow the tracks to stay operational.
- C. Track protection is required for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail.
- D. The Contractor is also advised that new railroad facilities within the project may be built by UPRR and that certain Contractor's activities cannot proceed until that work is completed. The Contractor shall be aware of the limits of responsibilities and allow sufficient time in the schedule for that work to be accomplished and shall coordinate its efforts with UPRR.

3.02 RAILROAD OPERATIONS

- A. The Contractor shall be advised that trains and/or equipment are expected on any track, at any time, in either direction. Contractor shall become familiar with the train schedules in this location and structure its bid assuming intermittent track windows in this period, as defined in Paragraph B below.
- B. All railroad tracks within and adjacent to the Contract Site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. The Contractor shall coordinate and schedule the work so that construction activities do not interfere with railroad operations.
- C. Work windows for this Contract shall be coordinated with the Agency's and the UPRR Designated Representatives. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:
 - 1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and adjacent to the railroad tracks within 25 feet of the nearest track center line, an UPRR flag person will be required. At the direction of the UPRR flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the UPRR Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. **Absolute Work Window:** An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window the railroad tracks and/or signals must be completely operational for train operations and all UPRR, Public Utilities Commission (PUC) and Federal Railroad Administration (FRA) requirements, codes and regulations for operational tracks must be complied with. In the situation where the operating tracks and/or signals have been affected, the UPRR will perform inspections of the work prior to placing that track back into service. UPRR flag persons will be required for construction activities requiring an Absolute Work Window. **Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for UPRR review.**

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

- A. Prior to beginning any work on or over the property of, or affecting the facilities of, UPRR, Contractor shall execute the Contractor's Endorsement that is a part of the Right of Entry Agreement to be signed by UPRR and Agency. Contractor shall submit a copy of the executed agreement and the insurance policies, binders, certificates and endorsements set forth therein to the Agency prior to commencing work on UPRR property. The right of entry agreement shall specify working time frames, flagging and inspection requirements, and any other items specified by UPRR.
- B. The Contractor shall give the advance notice to UPRR as required in the Right of Entry Agreement before commencing work in connection with construction upon or over UPRR Right-of-Way and shall observe UPRR rules and regulations with respect thereto.
- C. All work upon UPRR Right-of-Way shall be done at such times and in such manner so as not to interfere with or endanger the operations of UPRR. Whenever work may affect the operations or safety of trains, the method of doing such work shall first be submitted to UPRR's Designated Representative for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor, which requires flagging and/or inspection service, shall be deferred until the flagging protection required by UPRR is available at the job site. See Section 3.18 for railroad flagging requirements.
- D. The Contractor shall make requests in writing for both Absolute and Conditional Work Windows, at least two weeks in advance of any work. The written request must include:
 1. Exactly what the work entails.
 2. The days and hours that work will be performed.
 3. The exact location of work, and proximity to the tracks.
 4. The type of window requested and the amount of time requested.

5. The designated contact person.

Contractor shall provide a written confirmation notice to UPRR at least 48 hours before commencing work in connection with approved work windows when work will be performed within **25 feet of any track center line**. All work shall be performed in accordance with previously approved work plans.

- E. Should a condition arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of UPRR, Contractor shall make such provisions. If in the judgment of UPRR's Designated Representative such provisions are insufficient, the UPRR Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to UPRR. UPRR or the Agency shall have the right to order Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the UPRR's Designated Representative, the Contractor's operations could endanger UPRR operations. In the event such an order is given, Contractor shall immediately notify the Agency of the order.

3.04 INSURANCE

Contractor shall not begin work upon or over UPRR Right-of-Way until UPRR has been furnished the insurance policies, binders, certificates and endorsements required by the Right-of-Entry Agreement and UPRR's Designated Representative has advised the Agency that such insurance is in accordance with the Agreement. The required insurance shall be kept in full force and effect during the performance of work and thereafter until Contractor removes all tools, equipment, and material from UPRR's property and cleans the premises in a manner reasonably satisfactory to UPRR.

3.05 RAILROAD SAFETY ORIENTATION

All personnel employed by the Contractor and all subcontractors must complete the UPRR or equivalent course "Orientation for Contractor's Safety", and be registered prior to working on UPRR property. This orientation is available at www.contractororientation.com. This course is required to be completed annually.

3.06 COOPERATION

UPRR will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of UPRR's right-of-way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

The Contractor shall abide by the following minimum temporary clearances during the course of construction:

- A. 12' – 0" horizontal from centerline of track

- B. 21' – 6" vertically above top of rail.

For construction clearance less than listed above, local Operating Unit review and approval is required.

3.08 APPROVAL OF REDUCED CLEARANCES

- A. The minimum track clearances to be maintained by the Contractor during construction are specified in Section 3.07 herein.
- B. Any proposed infringement on the specified minimum clearances due to the Contractor's operations shall be submitted to UPRR's Designated Representative through the Agency at least 30 days in advance of the work and shall not be undertaken until approved in writing by UPRR's Designated Representative.
- C. No work shall commence until the Contractor receives in writing assurance from UPRR's Designated Representative that arrangements have been made for flagging service, as may be necessary and receives permission from UPRR's Designated Representative to proceed with the work.

3.09 CONSTRUCTION AND AS-BUILT SUBMITTALS

- A. Submittals are required for construction materials and procedures as outlined below. The submittals shall include all review comments from the Agency and the Engineer of Record. All design submittals shall be stamped and signed by a Professional Engineer registered in the State of California.
- B. The tables below provide UPRR's minimum submittal requirements for the construction items noted. Submittal requirements are in addition to those specified elsewhere in these bid documents. The minimum review times indicated below represent UPRR's requirements only. The Contractor shall allow additional time for the Agency's review time as stated elsewhere in these bid documents.
- C. Submittals shall be made by the Agency to UPRR's designated representative unless otherwise directed by the Railroad. Items in Table 1 shall be submitted for both railroad overpass and underpass projects, as applicable. Items in Table 2 shall be submitted for railroad underpass projects only.

TABLE 1

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>SETS REQD.</u>	<u>UPRR's Minimum Review Time</u>
1	Shoring design and details	4	4 weeks
2	Falsework design and details	4	4 weeks
3	Drainage design provisions	4	4 weeks
4	Erection diagrams and	4	4 weeks

	sequence		
5	Demolition diagram and sequence	4	4 weeks

Prior to or during construction of railroad's viaduct bridge structure, UPRR requires the review of drawings, reports, test data and material data sheets to determine compliance with the specifications. Product information for items noted in Table 2 be submitted to UPRR's Designated Representative through the Agency for their own review and approval of the material. UPRR or their consultant will review the signed submittal and the Agency's review comments. If a consultant performs the reviews, the consultant may reply directly to the Agency or its Designated Representative after consultation with UPRR. Review of the submittals will not be conducted until after review by the Agency or its Designated Representative. Review of the submittal items will require a minimum of four (4) weeks after receipt from the Agency.

TABLE 2

ITEM	DESCRIPTION	SETS REQD.	NOTES
1	Shop drawings	4	Steel and Concrete members
2	Bearings	4	For entire structures
3	Concrete Mix Designs	4	For entire structures
4	Rebar & Strand certifications	4	For superstructure only
5	28 day concrete strength	4	For superstructure only
6	Waterproofing material certifications and installation procedure	4	Waterproofing & protective boards
7	Structural steel certifications	4	All fracture critical members & other members requiring improved notch toughness
8	Fabrication and Test reports	4	All fracture critical members & other members requiring improved notch toughness
9	Welding Procedures and Welder Certification	4	AWS requirements
10	Foundation Construction Reports	4	Pile driving, drilled shaft construction, bearing pressure test reports for spread footings
11	Compaction testing reports for backfill at abutments	4	Must meet 95% maximum dry density, Modified Proctor ASTM D1557

D. As-Built Records shall be submitted to UPRR within 60 days of completion of the structures. These records shall consist of the following items:

Overpass Projects

1. Electronic files of all structure design drawings with as-constructed modifications shown, in Microstation J or Acrobat .PDF format.
2. Hard copies of all structure design drawings with as-constructed modifications shown.

Underpass Projects

1. Electronic files of all structure design drawings with as-constructed modifications shown, in Microstation J or Acrobat .PDF format.
2. Hard copies of all structure design drawings with as-constructed modifications shown.
3. Final approved copies of shop drawings for concrete and steel members.
4. Foundation Construction Reports
5. Compaction testing reports for backfill at abutments

3.10 APPROVAL OF DETAILS

The details of the construction affecting UPRR tracks and property not already included in the Contract Plans shall be submitted to UPRR's Designated Representative through the Agency for UPRR's review and written approval before such work is undertaken. Review and approval of these submittals will require a minimum of four (4) weeks in addition to the Agency's review time as stated elsewhere in these bid documents.

New submittals and resubmittals are treated the same and will require a minimum of 4 weeks for UPRR to review. Once the Contractor is notified to resubmit, the Contractor must make all necessary changes within 20 days of this notice and must provide the revised submittal to the Agency for preapproval prior to the start of UPRR's review.

3.11 MAINTENANCE OF RAILROAD FACILITIES

- A. The Contractor shall be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from Contractor's operations; to promptly repair eroded areas within UPRR's right of way and to repair any other damage to the property of UPRR, or its tenants.
- B. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.
- C. The Contractor must submit a proposed method of erosion control and have the method reviewed by UPRR prior to beginning any grading on the Project Site. Erosion control methods must comply with all applicable local, state and federal regulations.

3.12 SITE INSPECTIONS BY UPRR's DESIGNATED REPRESENTATIVE

- A. In addition to the office reviews of construction submittals, site inspections may be performed by UPRR's Designated Representative at significant points during construction, including but not limited to the following:
 - 1. Preconstruction meetings.
 - 2. Pile driving, drilling of caissons or drilled shafts.
 - 3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
 - 4. Erection of precast concrete or steel bridge superstructure.
 - 5. Placement of waterproofing (prior to placing ballast on bridge deck).
 - 6. Completion of the bridge structure.
- B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by UPRR.
- C. A detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to be performed, shall be provided to the Agency for submittal to UPRR's Designated Representative for review prior to commencement of work. This schedule shall also include the anticipated dates when the above listed events will occur. This schedule shall be updated for the above listed events as necessary, but at least monthly so that site visits may be scheduled.

3.13 UPRR's REPRESENTATIVES

- A. UPRR representatives, conductors, flag person or watch person will be provided by UPRR at expense of the Agency or Contractor (as stated elsewhere in these bid documents) to protect UPRR facilities, property and movements of its trains or engines. In general, UPRR will furnish such personnel or other protective services as follows:
 - 1. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from centerline of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
 - 2. For any excavation below elevation of track subgrade if, in the opinion of UPRR's Designated Representative, track or other UPRR facilities may be subject to settlement or movement.
 - 3. During any clearing, grubbing, excavation or grading in proximity to UPRR facilities, which, in the opinion of UPRR's Designated Representative, may endanger UPRR facilities or operations.
 - 4. During any contractor's operations when, in the opinion of UPRR's Designated Representative, UPRR facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

5. The Contractor shall arrange with the UPRR Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.14 WALKWAYS REQUIRED

Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than twelve feet (12') from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while UPRR's flagman service is provided shall be removed before the close of each work day. Walkways with railings shall be constructed by Contractor over open excavation areas when in close proximity of track, and railings shall not be closer than 12'-0" horizontally from centerline of track.

3.15 COMMUNICATIONS AND SIGNAL LINES

If required, UPRR will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by UPRR's forces in connection with its operation at expense of the Agency. This work by UPRR will be done by its own forces and it is not a part of the Work under this Contract.

3.16 TRAFFIC CONTROL

Contractor's operations that control traffic across or around UPRR facilities shall be coordinated with and approved by the UPRR's Designated Representative.

3.17 CONSTRUCTION EXCAVATIONS

- A. The Contractor shall be required to take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of OSHA, AREMA and "Guidelines for Temporary Shoring".
- B. The Contractor shall contact UPRR's "Call Before Your Dig" at least 48 hours prior to commencing work at 1-800-336-9193 during normal business hours (6:30 a.m. to 8:00 p.m. central time, Monday through Friday, except holidays - also a 24 hour, 7 day a week number for emergency calls) to determine location of fiber optics. If a telecommunications system is buried anywhere on or near UPRR property, the Contractor will co-ordinate with UPRR and the Telecommunication Company (ies) to arrange for relocation or other protection of the system prior to beginning any work on or near UPRR property.

3.18 RAILROAD FLAGGING

Performance of any work by the Contractor in which person(s) or equipment will be within twenty-five (25) feet of any track, or will be near enough to any track that any equipment extension (such as, but not limited to, a crane boom) will reach within twenty-five (25) feet of any track, may require railroad flagging services or other protective measures. Contractor shall give the advance notice to the UPRR as required in the "Contractor's Right of Entry Agreement" before commencing any such work, so that the UPRR may determine the need for flagging or other protective measures to ensure the safety of the railroad's operations. Contractor shall comply with all other requirements regarding flagging services covered by the "Contractor's Right of Entry Agreement". Any costs associated with failure to abide by these requirements will be borne by the Contractor.

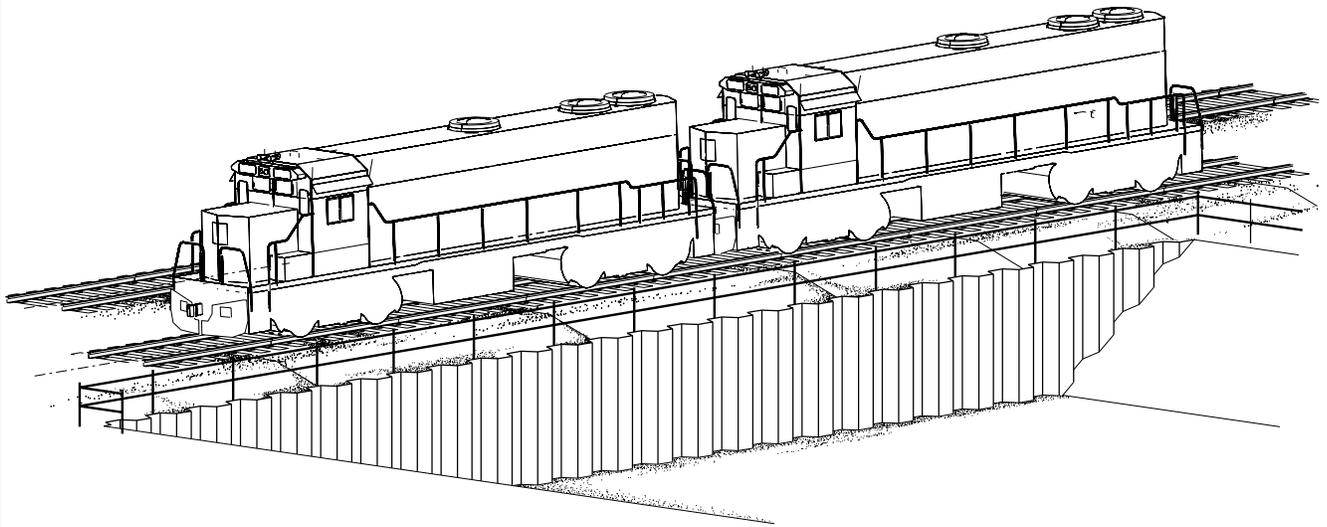
3.19 CLEANING OF RIGHT-OF-WAY

Contractor shall, upon completion of the work to be performed by Contractor upon the premises, over or beneath the tracks of UPRR, promptly remove from the Right-of-Way of UPRR all of Contractor's tools, implements, and other materials whether brought upon the Right-of-Way by Contractor or any subcontractors, employee or agent of Contractor or of any subcontractor, and leave the Right-of-Way in a clean and presentable condition to satisfaction of UPRR.

EXHIBIT F

Railroad's Guidelines for Temporary Shoring

GUIDELINES FOR TEMPORARY SHORING



"CALL BEFORE YOU DIG!"
1-800-533-2891

ASSISTANT DIRECTOR STRUCTURE DESIGN
4515 KANSAS AVE
KANSAS CITY, KS 66106-1124



BUILDING AMERICA™

"CALL BEFORE YOU DIG!"
1-800-336-9193

OFFICE AVP ENGINEERING - DESIGN
1400 DOUGLAS ST. STOP 0910
OMAHA, NE 68179-0910

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GUIDELINES FOR TEMPORARY SHORING

1. SCOPE

The scope of these guidelines is to inform public agencies, design engineers, contractors and inspectors of current Railroad standards and requirements concerning design and construction of temporary shoring.

1. The term **Railroad** refers to the Burlington Northern & Santa Fe Railway (BNSF) and/or the Union Pacific Railroad (UPRR). The term **Contractor** is defined as any party gaining access to work on Railroad right-of-way or other Railroad operating locations.
2. These guidelines are provided as a reference and may not be taken as authority to construct without prior review and written approval of the Railroad. These guidelines supersede all previous guidelines for temporary shoring and are subject to revision without notice.
3. These guidelines supplement the current, American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual of Recommended Practice. The 2002 AREMA Manual was utilized in developing this guideline. The AREMA Manual is available from:

American Railway Engineering and Maintenance-of-Way Association
8201 Corporate Drive, Suite 1125
Landover, MD 20785-2230
Phone: (301) 459-3200
FAX: (301) 459-8077
www.arema.org

4. The specific requirements for temporary shoring addressed in this document shall be followed for all locations where the Railroad operates, regardless of track ownership.
5. Any items not covered specifically herein shall be in accordance with the AREMA Manual and subject to the review and approval of the Railroad. Where conflicts exist, the most stringent specification should be applied.
6. All excavations shall also be governed by Railroad requirements, Federal, State and Local laws, rules, and regulations concerning construction safety.
7. Safe rail operations shall be required for the duration of the project. All personnel, railroad tracks and property shall be protected at all times.
8. To expedite the review process of the temporary shoring plans, drawings submitted by the Contractors are required to adhere to the project specifications, AREMA and other Railroad requirements.

2. GENERAL CRITERIA

The Contractor must not begin construction of any component of the shoring system affecting the Railroad right-of-way until written Railroad approval has been received.

1. All excavations shall be in compliance with applicable OSHA regulations and shall be shored where there is any danger to tracks, structures or personnel regardless of depth.

2. The Contractor is responsible for planning and executing all procedures necessary to construct, maintain and remove the temporary shoring system in a safe and controlled manner.
3. Emergency Railroad phone numbers are to be obtained from the Railroad representative in charge of the project prior to the start of any work and shall be posted at the job site.
4. The Contractor must obtain a valid right of entry permit from the Railroad and comply with all Railroad requirements when working on Railroad property.
5. The Contractor is required to meet minimum safety standards as defined by the Railroad.
6. All temporary shoring systems that support or impact the Railroad's tracks or operations shall be designed and constructed to provide safe and adequate rigidity.
7. The Railroad requirements, construction submittal review times and review criteria should be discussed at the pre-construction meeting with the Contractor.
8. A flagman is required when any work is performed within 25 feet of track centerline. If the Railroad provides flagging or other services, the Contractor shall not be relieved of any responsibilities or liabilities as set forth in any document authorizing the work. No work is allowed within 50 feet of track centerline when a train passes the work site and all personnel must clear the area within 25 feet of track centerline and secure all equipment when trains are present.
9. Appropriate measures for the installation and protection of fiber optic cables shall be addressed in the plans and contract documents. For specific Railroad requirements and additional information refer to:

www.bnsf.com or call 1-800-533-2891.

www.uprr.com, call 1-800-336-9193 or refer to UPRR Fiber Optic Engineering, Construction and Maintenance Standards.
10. Relocation of utilities or communication lines not owned by the Railroad shall be coordinated with the utility owners. The utility relocation plans must then be submitted to the Railroad utility representative for approval. The shoring plans must include the correct contact for the Railroad, State or Local utility locating service provider. The Railroad will not be responsible for cost associated with any utility, signal, or communication line relocation or adjustments.

3. CONTRACTOR RESPONSIBILITIES

The Contractor shall be solely responsible for the design, construction and performance of the temporary structure. **(AREMA 8.28.1.3)**

1. The Contractor's work shall in no way impede the train operations of the Railroad and must be coordinated with the local Railroad operating department.
2. The Contractor shall develop a work plan that enables the track(s) to remain open to train traffic at all times.
3. The Contractor shall comply with all State and Federal Laws, county or municipal ordinances and regulations which in any manner affect the work.
4. All removed soils will become the responsibility of the Contractor and shall be disposed of outside the Railroad right-of-way according to the applicable Federal, State and Local regulations.
5. The Project Engineer and the Contractor shall evaluate the quality of materials furnished and work performed.

6. The Contractor is responsible to protect the Railroad ballast and subballast from contamination.
7. The Contractor must monitor and record top of rail elevations and track alignment for the duration of the project. The movement shall be within the limits defined in **Table 1, Deflection Criteria** on page 10. Displacements exceeding the limits defined in **Table 1** must be immediately reported to the Railroad. All work on the project must stop and the Railroad may take any action necessary to ensure safe passage of trains. The Contractor must immediately submit a corrective action plan to the Railroad for review and approval. The Railroad must review and approve the proposed repair procedure. The repair must be inspected by the Railroad before the track can be placed back in service.
8. Any damage to Railroad property such as track, signal equipment or structure could result in a train derailment. All damage must be reported immediately to the Railroad representative in charge of the project and to the Railroad Manager of Track Maintenance (MTM).

4. INFORMATION REQUIRED

Plans and calculations shall be submitted, signed and stamped by a Registered Professional Engineer familiar with Railroad loadings and who is licensed in the state where the shoring system is intended for use. Shoring design plans and calculations shall be in English units. If Metric units are used, all controlling dimensions, elevations, design criteria assumptions, and material stresses shall be expressed in dual units, with English units to be in parentheses. Information shall be assembled concerning right-of-way boundary, clearances, proposed grades of tracks and roads, and all other factors that may influence the controlling dimensions of the proposed shoring system. See section 10 for additional requirements.

1. Field Survey.

Sufficient information shall be shown on the plans in the form of profiles, cross sections and topographical maps to determine general design and structural requirements. Field survey information of critical or key dimensions shall be referenced to the centerline of track(s) and top of rail elevations. Existing and proposed grades and alignment of tracks and roads shall be indicated together with a record of controlling elevation of water surfaces or ground water. Show the location of existing/proposed utilities and construction history of the area which might hamper proper installation of the piling, soldier beams, or ground anchors.

2. Geotechnical Report shall provide:

- a. Elevation and location of soil boring in reference to the track(s) centerline and top of rail elevations.
- b. Classification of all soils encountered.
- c. Internal angle of soil friction.
- d. Dry and wet unit weights of soil.
- e. Active and passive soil coefficients, pressure diagram for multiple soil strata.
- f. Bearing capacity and unconfined compression strength of soil.
- g. Backfill and compaction recommendations.
- h. Optimum moisture content of fill material.
- i. Maximum density of fill material.
- j. Minimum recommended factor of safety.
- k. Water table elevation on both sides of the shoring system.
- l. Dewatering wells and proposed flownets or zones of influence.
- m. In seismic areas, evaluation of liquefaction potential of various soil strata.

3. Loads.

All design criteria, temporary and permanent loading must be clearly stated in the design calculations and on the contract and record plans. Temporary loads include, but are not limited to: construction equipment, construction materials and lower water levels adjoining the bulkhead causing unbalanced hydrostatic pressure. Permanent loads include, but are not limited to: future grading and paving, Railroads or highways, structures, material storage piles, snow and earthquake. The allowable live load after construction should be clearly shown in the plans and painted on the pavements behind the bulkheads or shown on signs at the site and also recorded on the record plans. Some of the loads are:

- a. Live load pressure due to E80 loading for track parallel to shoring system.
- b. Live load pressure due to E80 loading for track at right angle to shoring system.
- c. Other live loads.
- d. Active earth pressure due to soil.
- e. Passive earth pressure due to soil.
- f. Active earth pressure due to surcharge loads.
- g. Active pressure due to sloped embankment.
- h. Dead load.
- i. Buoyancy.
- j. Longitudinal force from live load.
- k. Centrifugal forces.
- l. Shrinkage.
- m. Temperature.
- n. Earthquake.
- o. Stream flow pressure.
- p. Ice pressure.

4. Drainage. (**AREMA 8.20.2.4**)

- a. The drainage pattern of the site before and after construction should be analyzed and adequate drainage provisions should be incorporated into the plans and specifications. Consideration should be given to groundwater as well as surface drainage.
- b. Drainage provisions for backfill should be compatible with the assumed water conditions in design.

5. Structural design calculations.

- a. List all assumptions used to design the temporary shoring system.
- b. Determine E80 live load lateral pressure using the Boussinesq strip load equation. See **Figure 2** which illustrates Plan Number **710001 "LIVE LOAD PRESSURE DUE TO COOPER E80"**.
- c. Computerized calculations and programs must clearly indicate the input and output data. List all equations used in determining the output.
- d. Example calculations with values must be provided to support computerized output and match the calculated computer result.
- e. Provide a simple free body diagram showing all controlling dimensions and applied loads on the temporary shoring system.
- f. Calculated lateral deflections of the shoring and effects to the rail system must be included. See section 8, Part 6. Include the elastic deflection of the wall as well as the deflection due to the passive deflection of the resisting soil mass.
- g. Documents and manufacturer's recommendations which support the design assumptions must be included with the calculations.

5. TYPES OF TEMPORARY SHORING

1. A shoring box is a prefabricated shoring system which is installed as the excavation progresses. This shoring system is not accepted by the Railroad. This system is allowed in special applications only, typically where Railroad live load surcharge is not present. The shoring box is moved down into the excavation by gravity or by applying vertical loading from excavation equipment.
2. Anchored systems with tiebacks are discouraged. The tiebacks will be an obstruction to future utility installations and may also damage existing utilities. Tiebacks must be removed per Railroad direction. Removal of tieback assemblies is problematic.
3. An anchored sheet pile wall is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the sheet pile is embedded and the tensile resistance of the anchors.
 - a. For purposes of these guidelines, ground anchors shall be cement-grouted tiebacks designed, furnished, installed, tested and stressed in accordance with the project specifications and AREMA requirements.
4. An anchored soldier beam with lagging wall is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the soldier beam is embedded and from the tensile resistance of the ground anchors.
 - a. Anchored soldier beam with lagging walls are generally designed as flexible structures which have sufficient lateral movement to mobilize active earth pressures and a portion of the passive pressure.
 - b. For purposes of these specifications, soldier beams include steel H-piles, wide flange sections or other fabricated sections that are driven or set in drilled holes. Lagging refers to the members spanning between soldier beams.
5. A cantilever sheet pile wall is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the sheet pile is embedded. If cantilever sheet pile is used for shoring adjacent to an operating track, the shoring system shall be at least 12'-0" away from the centerline of track. Cantilever sheet pile walls shall be used only in granular soils or stiff clays.
6. A cantilever soldier beam with lagging wall is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the soldier beam is embedded.
7. A braced excavation is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the vertical members are embedded and from the structural capacity of the bracing members.
 - a. For purposes of these guidelines, the vertical members of the braced excavation system include steel sheet piling or soldier beams comprised of steel H-piles, wide flange sections, or other fabricated sections that are driven or installed in drilled holes. Wales are horizontal structural members designed to transfer lateral loads from the vertical members to the struts. Struts are structural compression members that support the lateral loads from the wales.
8. A cofferdam is an enclosed temporary structure used to keep water and soil out of an excavation for a permanent structure such as a bridge pier or abutment or similar structure. Cofferdams may be constructed of timber, steel, concrete or a combination of these. These guidelines consider cofferdams primarily constructed with steel sheet piles.

6. GENERAL SHORING REQUIREMENTS

For general shoring requirements and specific applications of the following items refer to **Figure 1** on the next page which illustrates Plan Number **710000 "GENERAL SHORING REQUIREMENTS"**.

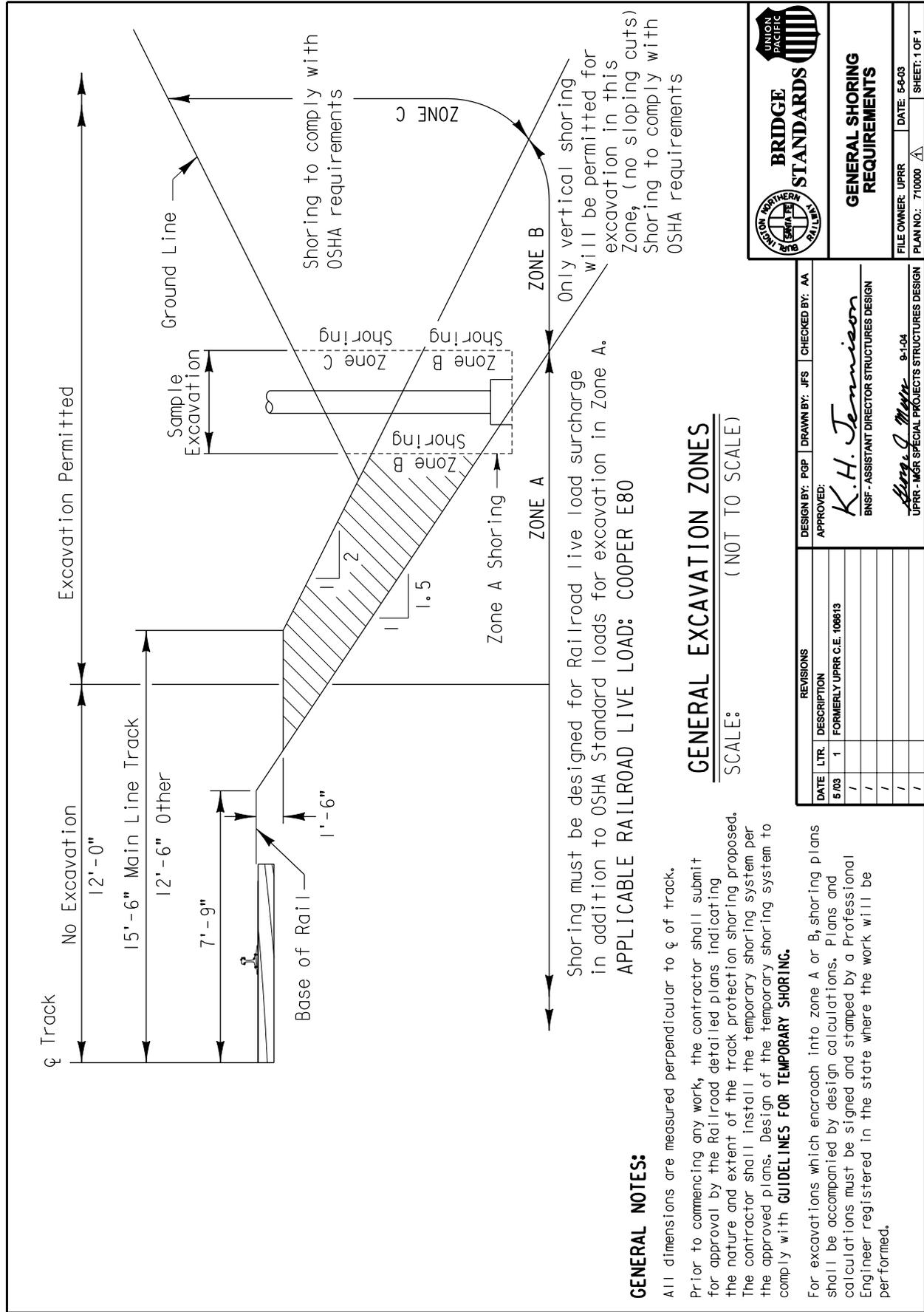


Figure 1

1. No excavation shall be permitted closer than 12'-0" measured at a right angle from the centerline of track to the trackside of shoring system. If existing conditions preclude the installation of shoring at the required minimum distance, the shifting of tracks or temporary removal of tracks shall be investigated prior to any approval. All costs associated with track shifting or traffic interruption shall be at Contractor's expense.
2. Evaluate slope and stability conditions to ensure the Railroad embankment will not be adversely affected. Local and global stability conditions must also be evaluated.
3. All shoring within the limits of Zone A or Zone B must be placed prior to the start of excavation.
4. Lateral clearances must provide sufficient space for construction of the required ditches parallel to the standard roadbed section. The size of ditches will vary depending upon the flow and terrain and should be designed accordingly.
5. The shoring system must be designed to support the theoretical embankment shown for zones A and B.
6. Any excavation, holes or trenches on the Railroad property shall be covered, guarded and/or protected. Handrails, fence, or other barrier methods must meet OSHA and FRA requirements. Temporary lighting may also be required by the Railroad to identify tripping hazards to train crewmen and other Railroad personnel.
7. The most stringent project specifications of the Public Utilities Commission Orders, Department of Industrial Safety, OSHA, FRA, AREMA, BNSF, UPRR or other governmental agencies shall be used.
8. Secondhand material is not acceptable unless the Engineer of Record submits a full inspection report which verifies the material properties and condition of the secondhand material. The report must be signed and sealed by the Engineer of Record.
9. All components of the shoring system are to be removed when the shoring is no longer needed. All voids must be filled and drainage facilities restored. See compaction requirements section 9, Part 4.
10. Slurry type materials are not acceptable as fill for soldier piles in drilled holes. Concrete and flowable backfill may prevent removal of the shoring system. Use compacted peagravel material.

7. COMPUTATION OF APPLIED FORCES

1. Railroad live load and lateral forces.
 - a. For specific applications of the Coopers E80 live load refer to **Figure 2** on the next page which illustrates Plan Number **710001 "LIVE LOAD PRESSURE DUE TO COOPER E80"**. Supplemental information and sample calculations are provided in the Appendix pages A-1 through A-4.
2. Dead load.
 - a. Spoil pile: must be included assuming a minimum height of two feet of soil adjacent to the excavation.
 - b. Track: use 200 lbs/linear ft for rails, inside guardrails and fasteners.
 - c. Roadbed: ballast, including track ties, use 120 lb per cubic foot.

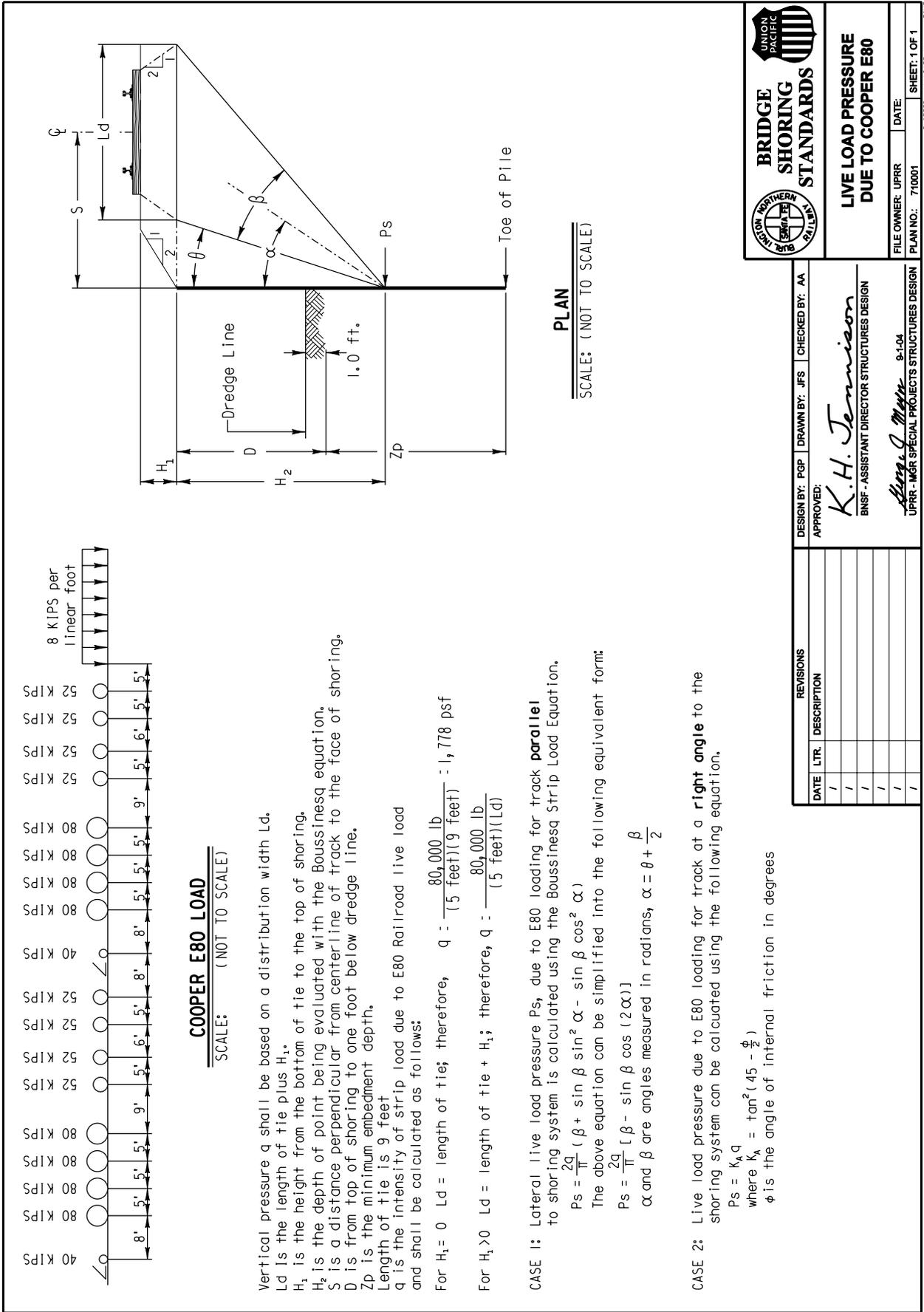


Figure 2

3. Active earth pressure.

a. The active earth pressure due to the soil may be computed by the Coulomb Theory or other approved method.

b. The active earth pressure at depth “ z_a ” is:

$$P_A = K_A \gamma z_a, \text{ where } K_A = \tan^2(45 - \frac{\phi}{2})$$

z_a = depth of soil influencing the active pressure.

4. Active earth pressure due to unbalanced water pressure.

a. When bulkheads are used for waterfront construction, the bulkhead is subjected to a maximum earth pressure at the low water stage. During a rainstorm or a rapidly receding high water, the water level behind the bulkhead may be several feet higher than in front of the bulkhead.

b. Drained conditions in backfill apply when clean sand or clean sand and gravel are used and adequate permanent drainage outlets are provided. Where drained conditions exist, the design water level may be assumed at the drainage outlet elevation.

5. Active earth pressure due to surcharge load.

The active earth pressure due to surcharge load q' :

$$P_U = K_A q', \text{ where } K_A = \tan^2(45 - \frac{\phi}{2})$$

6. Passive earth pressure.

The passive earth pressure, P_p , in front of the bulkhead may also be computed by the Coulomb Theory.

$$P_p = K_p \gamma z_p, \text{ where } K_p = \tan^2(45 + \frac{\phi}{2})$$

z_p = vertical distance beginning one foot below dredge line but not to exceed embedment depth

7. Pressure due to embankment surcharges.

Conventional analysis (Rankine, Coulomb, or Log-Spiral) should be used to determine the additional surcharge from embankment slopes.

8. Additional analysis for centrifugal force calculations as described in **AREMA Chapter 15, Part 1, Section 1.3, Article 1.3.6** Centrifugal Loads are required where track curvature exceeds three degrees.

9. Include and compute all other loads that are impacting the shoring system such as a typical Railroad service vehicle (HS-20 truck).

8. STRUCTURAL INTEGRITY

Structures and structural members shall be designed to have design strengths at all sections at least equal to the required strengths calculated for the loads and forces in such combinations as stipulated in **AREMA Chapter 8 Part 2 Article 2.2.4b**, which represents various combinations of loads and forces to which a structure may be subjected. Each part of the structure shall be proportioned for the group loads that are applicable, and the maximum design required shall be used.

1. Embedment depth.

a. Calculated depth of embedment is the embedment depth required to maintain static equilibrium.

- b. Minimum depth of embedment is the total depth of embedment required to provide static equilibrium plus additional embedment due to the minimum factor of safety.
 - 1. Embedment depth factor of safety for well-defined loading conditions and thoroughly determined soil parameters is generally 1.3 for most temporary shoring systems. (See **AREMA 8.20.4.1.c**)
 - 2. All anchored shoring systems require a minimum embedment depth of 1.5 times the calculated depth of embedment. Shallow penetration into strong soil layers is not acceptable. (See **AREMA 8.20.5.1**)
- 2. The allowable stresses based on AREMA requirements are as follows:
 - Structural Steel: $0.55F_y$ for Compression in extreme fiber. (**AREMA Ch.15 Table 1-11**)
 - Structural Steel: $0.35F_y$ for Shear. (**AREMA Ch.15 Table 1-11**)
 - Sheet Pile Sections: $2/3$ of yield strength for steel. (**AREMA 8.20.5.7**)
 - Concrete: $1/3$ of Compressive strength. (**AREMA 8.20.5.7**)
 - Anchor Rods: $1/2$ of yield strength for steel. (**AREMA 8.20.5.7**)
- 3. AISC allowances for increasing allowable stress due to temporary loading conditions are not acceptable.
- 4. Gravity type temporary shoring systems must also be analyzed for overturning, sliding and global stability.
- 5. The contractor is responsible for providing an approved test method to verify the capacity of anchored or tieback systems. The manufacturers recommendations for testing must be satisfied. Systems which support the Railroad embankment will be considered high risk in determining the percentage of elements to be proof tested.
- 6. Calculated deflections of temporary shoring system and top of rail elevation shall not exceed the criteria outlined in **Table 1 Deflection Criteria**.

Table 1 Deflection Criteria

Horizontal distance from shoring to track C/L measured at a right angle from track	Maximum horizontal movement of shoring system	Maximum acceptable horizontal or vertical movement of rail
$12' < S < 18'$	3/8"	1/4"
$18' < S < 24'$	1/2"	1/4"

9. SOIL CHARACTERISTICS

- 1. Subsurface Exploration. (**AREMA 8.5.2.2**)
 - a. Sufficient borings shall be made along the length of the structure to determine, with a reasonable degree of certainty, the subsurface conditions. Irregularities found during the initial soil boring program may dictate that additional borings be taken.
 - b. The subsurface investigation shall be made in accordance with the provisions of **AREMA Chapter 8 Part 22, Geotechnical Subsurface Investigation**.
- 2. Type of backfill.
 - a. Backfill is defined as material behind the wall, whether undisturbed ground or fill, that contributes to the pressure against the wall.

- b. The backfill shall be investigated and classified with reference to the soil types described in **AREMA Table 8-5-1**.
- c. Types 4 and 5 backfill shall be used only with the permission of the Engineer. In all cases the wall design shall be based on the type of backfill used.

Table 8-5-1 (AREMA) Types of Backfill for Retaining Walls

Backfill Type	Backfill Description
1	Coarse-grained soil without admixture of fine soil particles, very free-draining (clean sand, gravel or broken stone).
2	Coarse-grained soil of low permeability due to admixture of particles of silt size.
3	Fine silty sand; granular materials with conspicuous clay content; or residual soil with stones.
4	Soft or very soft clay, organic silt; or soft silty clay.
5	Medium or stiff clay that may be placed in such a way that a negligible amount of water will enter the spaces between the chunks during floods or heavy rains.

3. Computation of backfill pressure. **(AREMA 8.5.3.2a)**

- a. Values of the unit weight, cohesion, and angle of internal friction of the backfill material shall be determined directly by means of soil tests or, if the expense of such tests is not justifiable, by means of **AREMA Table 8-5-2** referring to the soil types defined in **AREMA Table 8-5-1**. Unless the minimum cohesive strength of the backfill material can be evaluated reliably, the cohesion shall be neglected and only the internal friction considered. See Appendix page A-6 for AREMA generic soil properties.

Table 8-5-2 (AREMA) Properties of Backfill Materials

Type of Backfill	Unit Weight Lb. Per Cu. Ft.	Cohesion "c"	Angle of Internal Friction
1	105	0	33°-42°(38°for broken stone)
2	110	0	30°
3	125	0	28°
4	100	0	0°
5	120	240	0°

4. Compaction.

- a. The backfill shall preferably be placed in loose layers not to exceed 8 inches in thickness. Each layer shall be compacted before placing the next, but over compaction shall be avoided.
- b. It is required that backfill be compacted to no less than 95% of maximum dry density at a moisture content within 2% of optimum and tested using Modified Proctor ASTM D1557.
- c. Fill within 100 feet of bridge ends or 20 feet outside culverts shall be placed and compacted to not less than 100% of maximum.
- d. No dumping of backfill material shall be permitted in such a way that the successive layers slope downward toward the wall. The layers shall be horizontal or shall slope downward away from the wall.

10. PLANS

The shoring plans must completely identify the site constraints and the shoring system. Use the design templates provided in the appendix as an example to show the required information, specifications and drawings. The specific requirements of the plan submittals are as follows:

1. General plan view should show:
 - a. Railroad right-of-way and North arrow.
 - b. Position of all Railroad tracks and identify each track as mainline, siding, spur, etc.
 - c. Spacing between all existing tracks.
 - d. Location of all access roadways, drainage ditches and direction of flow.
 - e. Footprint of proposed structure, proposed shoring system and any existing structures if applicable.
 - f. Proposed horizontal construction clearances. The minimum allowable is 12 feet measured at a right angle from centerline of track.
 - g. Location of existing and proposed utilities.
 - h. Drawings must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed.
 - i. Railroad and other "CALL BEFORE YOU DIG" numbers.
 - j. Detailed view of shoring along with controlling elevations and dimensions.
2. Typical section and elevation should show:
 - a. Top of rail elevations for all tracks.
 - b. Offset from the face of shoring system to the centerline of all tracks at all changes in horizontal alignment.
 - c. All structural components, controlling elevations and dimensions of shoring system.
 - d. All drainage ditches and controlling dimensions.
 - e. All slopes, existing structures and other facilities which may surcharge the shoring system.
 - f. Location of all existing and proposed utilities.
 - g. Total depth of shoring system.
3. General criteria
 - a. Design loads to be based on the AREMA manual and Cooper E80 loading.
 - b. Pressure due to embankment surcharges.
 - c. ASTM designation and yield strength for each material.
 - d. Maximum allowable bending stress for structural steel is $0.55F_y$.
 - e. Temporary overstress allowances are not acceptable.
 - f. All timber members shall be Douglas Fir grade 2 or better.
 - g. In situ soil classification.
 - h. Backfill soil classification.
 - i. Internal angle of friction and unit weight of the soil.
 - j. Active and passive soil coefficients.
 - k. Fill within 100 feet of bridge ends or 20 feet outside culverts shall be placed and compacted to a minimum of 100% of maximum dry density tested per Modified Proctor ASTM D1557.
 - l. Slopes without shoring shall not be steeper than 2 horizontal to 1 vertical

- m. Dredge line elevation.
 - n. Shoring deflection to be calculated and meet Railroad requirements.
4. Miscellaneous:
- a. Project name, location, GPS coordinates, track owner, Railroad line segment, milepost and subdivision in the title block.
 - b. Procedure outlining the installation and removal of the temporary shoring system.
 - c. General notes specifying material requirements, design data, details, dimensions, cross-sections, sequence of construction etc.
 - d. A description of the tieback installation including drilling, grouting, stressing information and testing procedures, anchor capacity, type of tendon, anchorage hardware, minimum unbonded lengths, minimum anchor lengths, angle of installation, tieback locations and spacing.
 - e. All details for construction of drainage facilities associated with the shoring system shall be clearly indicated.
 - f. Details and descriptions of all shoring system members and connection details.
 - g. Settlement and displacement calculations.
 - h. Handrail and protective fence details along the excavation.
 - i. Drawings must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed.
 - j. Call before you dig number.
 - k. Construction clearance diagram.

11. SUBMITTALS

The Contractor will be responsible for any and all cost associated with the review of plans by the Railroad. Review of design submittals by the Railroad will require a minimum of four (4) weeks. To avoid impacting the construction schedule, the Contractor must schedule submittals well in advance. Partial, incomplete or inadequate designs will be rejected, thus delaying the approval. Revised submittals will follow the same procedure as the initial submittal until all issues are resolved. Submit a minimum of three sets of shoring plans and two sets of calculations with manufacturers' specifications. Drawings and calculations must be signed and stamped by a Registered Professional Engineer familiar with Railway loadings and who is licensed in the state where the shoring system is intended for use. Drawings accompanying the shoring plans shall be submitted on 11" x 17" or 8½" x 11" sized paper.

1. Contractor review.

The Contractor must review the temporary shoring plans to ensure that the proposed method of construction is compatible with the existing site and soil conditions. The Contractor's work plan must be developed to allow train traffic to remain in service. Removal of the shoring system must also be addressed.

2. Applicant and or Engineer of Record review.

The applicant and or Engineer of Record must review and approve the submittal for compliance with the project specifications, AREMA Manual, these guidelines and structural capacity before forwarding the submittal to the Railroad.

3. Review process.

All design submittals shall be forwarded to the Railroad Representative who will send them to the Structures Design Department. The Structures Design Department shall review or have an outside consultant review said submittals. If a Railroad consultant performs said review, the consultant may reply directly to the applicant or their representative after consultation with the Structures Design Department. A copy of the reply will be mailed to the Railroad Representative. During the review process the Railroad Representative is the point of contact to resolve outstanding issues.

12. APPENDIX

ITEM	PAGE
1. SAMPLE PROBLEM	A-1 & A-2
2. CHART A	A-3 & A-4
3. GUIDELINE & WEBSITE DIRECTORY	A-5
4. TABLES	A-6
AREMA Table 8-20-1. Granular Soils	
AREMA Table 8-20-2. Silt and Clay Soils	
AREMA Table 8-20-3. Unit Weights of Soils, and Coefficients of Earth Pressure	
5. TEMPLATES	
GENERAL CRITERIA AND MISCELLANEOUS	A-7
GENERAL PLAN VIEW	A-8
TYPICAL SECTION & ELEVATION VIEW	A-9

13. BIBLIOGRAPHY

The following list of references used in these guidelines are placed here in alphabetical order for your convenience.

1. *Manual for Railway Engineering*, 2002 American Railway Engineering and Maintenance-of-Way Association.
2. *TRENCHING AND SHORING MANUAL*, January 1990, Revision 11/12/96. State of California Department of Transportation, Office of Structures Construction.

SAMPLE PROBLEM

Point in question: S = 12 ft H = 6 ft

$$q = \frac{80,000 \text{ lbs}}{(5 \text{ ft})(9 \text{ ft})} = 1778 \text{ psf for E80 loading, axle spacing} = 5 \text{ ft, tie length } b = 9 \text{ ft}$$

Solve for $X_1 = S - b/2 = 7.5 \text{ ft}$

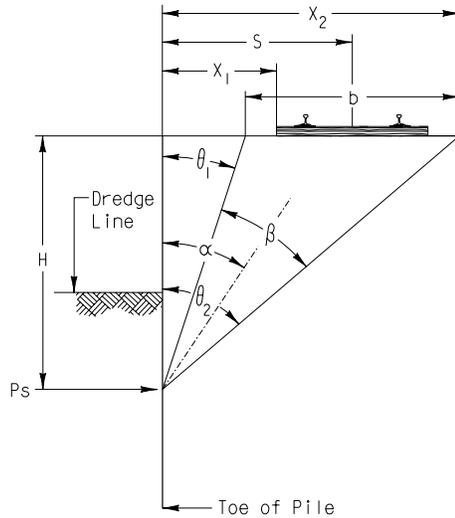
Solve for $X_2 = S + b/2 = 16.5 \text{ ft}$

Solve for $\theta_1 = \arctan\left(\frac{X_1}{H}\right) = 0.896 \text{ radians}$ Solve for $\theta_2 = \arctan\left(\frac{X_2}{H}\right) = 1.222 \text{ radians}$

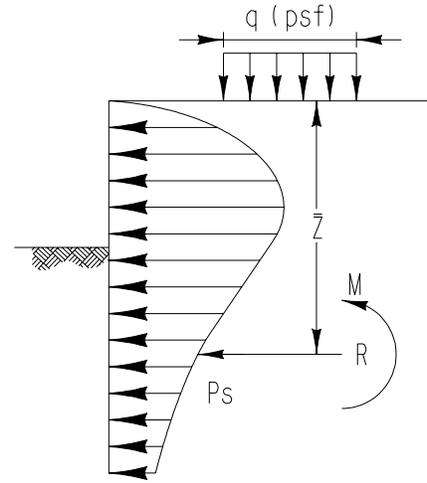
Solve for $\beta = \theta_2 - \theta_1 = 0.326 \text{ radians}$

Solve for $\alpha = \frac{\theta_1 + \theta_2}{2} = 1.059 \text{ radians}$

Note: $\tan \alpha \neq \frac{S}{H}$



PRESSURE DISTRIBUTION FOR STRIP LOAD



EQUIVALENT LOADING

- Pressure, P_s due to E80 liveload at the above-identified point:

$$P_s = \frac{2q}{\pi} (\beta - \sin \beta \cos 2\alpha) = \frac{2 * 1778}{\pi} (0.326 - \sin(0.326) \cos(2 * 1.059)) = 558 \text{ psf}$$

- Shear due to E80 liveload at the above-identified point:

$$R_x = \frac{2qH\beta}{\pi} = \frac{2 * 1778 * 6 * 0.326}{\pi} = 2214 \text{ lbs /ft}$$

- Depth \bar{z} from base of tie:

$$\bar{z} = \frac{H^2\beta - bH + x_2^2\left(\frac{\pi}{2} - \theta_2\right) - x_1^2\left(\frac{\pi}{2} - \theta_1\right)}{2H\beta} = \frac{6^2 * 0.326 - 9 * 6 + 16.5^2\left(\frac{\pi}{2} - 1.222\right) - 7.5^2\left(\frac{\pi}{2} - 0.896\right)}{2 * 6 * 0.326} = 3.77 \text{ ft}$$

SAMPLE PROBLEM (CONTINUED)

- Moment due to E80 liveload at the above identified point:

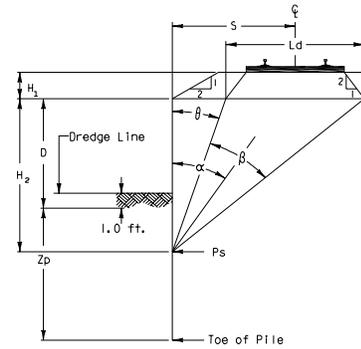
$$M = R_x (H - \bar{z}) = 2214 * (6 - 3.77) = 4940 \text{ ft-lbs/ft}$$

Use the above equations to determine P_s , M , R_x & \bar{z} due to the E80 liveload along the **entire** depth of the shoring system. Typically the equations are evaluated on 6" increments to determine the maximum values along the depth of the shoring system. The resultants must be combined with other applicable pressures and loads to evaluate the total loading on the shoring system for the entire depth of the system. Determine the minimum embedment depth required and the minimum cross sectional properties of the shoring system based on the allowable stresses and the required factors of safety.

CHART A

This chart identifies the active pressure and resulting forces due to E80 live load.
See "SAMPLE PROBLEM" sheet for definitions of variables and equations.

1. Select distance S from track centerline to face of shoring.
2. Select depth H₂ below base of tie.
3. Read P_s, M, R and \bar{z} from the table.
4. Use the procedure outlined in the sample problem to determine values at non-tabulated points.



$$P_s = \frac{2q}{\pi} [\beta - \sin \beta \cos(2\alpha)]$$

where q = 1778 psf

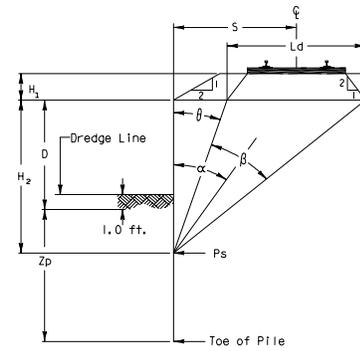
Boussinesq surcharge pressure E80 live load for H₁=0

Depth below top of shoring H ₂ (ft)	Variables	Horizontal distance (S) from shoring to track CL measured at a right angle									
		12	14	16	18	20	22	24	26	28	30
2	P_s (psf)	305	220	166	130	105	86	72	61	53	46
	α (radians)	1.38	1.41	1.44	1.45	1.47	1.48	1.48	1.49	1.50	1.50
	β (radians)	0.14	0.10	0.07	0.06	0.05	0.04	0.03	0.03	0.02	0.02
	\bar{z} (ft)	1.32	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
	M (ft-lbs/ft)	215	152	114	89	71	58	49	41	36	31
R (lbs/ft)	317	226	170	132	106	87	73	62	53	46	
4	P_s (psf)	496	381	299	240	197	164	138	118	102	89
	α (radians)	1.21	1.27	1.31	1.34	1.36	1.38	1.40	1.41	1.43	1.44
	β (radians)	0.25	0.19	0.14	0.11	0.09	0.07	0.06	0.05	0.05	0.04
	\bar{z} (ft)	2.59	2.61	2.63	2.64	2.64	2.65	2.65	2.65	2.65	2.66
	M (ft-lbs/ft)	1,609	1,165	882	692	557	459	384	327	281	244
R (lbs/ft)	1,141	840	643	508	411	339	285	242	209	182	
6	P_s (psf)	558	461	381	317	266	225	193	167	146	128
	α (radians)	1.06	1.13	1.19	1.23	1.27	1.29	1.32	1.34	1.35	1.37
	β (radians)	0.33	0.25	0.20	0.16	0.13	0.11	0.09	0.08	0.07	0.06
	\bar{z} (ft)	3.77	3.83	3.88	3.90	3.92	3.94	3.95	3.96	3.96	3.97
	M (ft-lbs/ft)	4,944	3,674	2,830	2,244	1,822	1,508	1,269	1,082	933	813
R (lbs/ft)	2,214	1,696	1,332	1,070	877	731	618	529	458	400	
8	P_s (psf)	535	476	414	358	309	268	234	205	181	160
	α (radians)	0.94	1.02	1.08	1.13	1.17	1.21	1.24	1.26	1.29	1.30
	β (radians)	0.37	0.29	0.24	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	\bar{z} (ft)	4.84	4.97	5.06	5.11	5.16	5.19	5.21	5.23	5.24	5.26
	M (ft-lbs/ft)	10,481	8,006	6,286	5,051	4,141	3,452	2,920	2,501	2,165	1,892
R (lbs/ft)	3,316	2,641	2,134	1,751	1,456	1,228	1,047	903	786	689	
10	P_s (psf)	474	449	411	370	329	293	260	232	207	186
	α (radians)	0.83	0.92	0.99	1.04	1.09	1.13	1.17	1.19	1.22	1.24
	β (radians)	0.38	0.32	0.26	0.22	0.19	0.16	0.14	0.12	0.10	0.09
	\bar{z} (ft)	5.81	6.02	6.16	6.26	6.34	6.39	6.44	6.47	6.50	6.52
	M (ft-lbs/ft)	18,145	14,227	11,385	9,280	7,689	6,463	5,502	4,736	4,117	3,610
R (lbs/ft)	4,328	3,571	2,964	2,482	2,099	1,792	1,544	1,341	1,175	1,037	
12	P_s (psf)	404	403	386	360	331	302	274	248	225	204
	α (radians)	0.75	0.83	0.90	0.96	1.01	1.06	1.10	1.13	1.16	1.18
	β (radians)	0.38	0.33	0.28	0.24	0.20	0.18	0.15	0.13	0.12	0.11
	\bar{z} (ft)	6.68	6.97	7.18	7.34	7.46	7.55	7.61	7.67	7.71	7.75
	M (ft-lbs/ft)	27,703	22,237	18,121	14,980	12,550	10,641	9,121	7,895	6,894	6,068
R (lbs/ft)	5,207	4,424	3,763	3,214	2,762	2,389	2,080	1,823	1,608	1,427	
14	P_s (psf)	338	351	349	337	319	298	276	255	234	215
	α (radians)	0.68	0.76	0.83	0.89	0.94	0.99	1.03	1.07	1.10	1.13
	β (radians)	0.38	0.33	0.28	0.25	0.22	0.19	0.17	0.15	0.13	0.12
	\bar{z} (ft)	7.46	7.85	8.13	8.35	8.51	8.64	8.74	8.82	8.89	8.94
	M (ft-lbs/ft)	38,880	31,856	26,395	22,116	18,729	16,021	13,831	12,043	10,568	9,339
R (lbs/ft)	5,948	5,178	4,499	3,913	3,414	2,990	2,631	2,327	2,068	1,847	
16	P_s (psf)	280	301	310	308	300	286	271	254	237	220
	α (radians)	0.62	0.70	0.77	0.83	0.88	0.93	0.97	1.01	1.04	1.07
	β (radians)	0.36	0.32	0.28	0.25	0.22	0.20	0.18	0.16	0.14	0.13
	\bar{z} (ft)	8.17	8.64	9.01	9.29	9.51	9.68	9.82	9.93	10.03	10.10
	M (ft-lbs/ft)	51,411	42,880	36,066	30,598	26,183	22,590	19,644	17,207	15,175	13,468
R (lbs/ft)	6,563	5,829	5,158	4,560	4,034	3,576	3,179	2,837	2,540	2,284	

CHART A continued

This chart identifies the active pressure and resulting forces due to E80 live load. See "SAMPLE PROBLEM" sheet for definitions of variables and equations.

1. Select distance S from track centerline to face of shoring.
2. Select depth H₂ below base of tie.
3. Read Ps, M, R and Z̄ from the table.
4. Use the procedure outlined in the sample problem to determine values at non-tabulated points.



$$P_s = \frac{2q}{\pi} [\beta - \sin \beta \cos(2\alpha)]$$

where q = 1778 psf

Boussinesq surcharge pressure E80 live load for H₁=0

Depth below top of shoring H ₂ (ft)	Variables	Horizontal distance (S) from shoring to track CL measured at a right angle									
		12	14	16	18	20	22	24	26	28	30
18	Ps (psf)	231	256	271	277	276	269	259	247	234	220
	α (radians)	0.57	0.64	0.71	0.77	0.82	0.87	0.92	0.96	0.99	1.02
	β (radians)	0.35	0.31	0.28	0.25	0.23	0.20	0.18	0.16	0.15	0.13
	Z̄ (ft)	8.80	9.37	9.81	10.16	10.44	10.67	10.85	11.00	11.12	11.22
	M (ft-lbs/ft)	65,062	55,110	46,976	40,313	34,834	30,304	26,536	23,384	20,728	18,477
	R (lbs/ft)	7,072	6,386	5,739	5,145	4,609	4,132	3,710	3,338	3,012	2,725
20	Ps (psf)	191	217	236	246	250	249	244	237	227	217
	α (radians)	0.52	0.59	0.66	0.72	0.77	0.82	0.87	0.91	0.94	0.98
	β (radians)	0.33	0.30	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14
	Z̄ (ft)	9.37	10.03	10.56	10.98	11.32	11.59	11.82	12.01	12.16	12.30
	M (ft-lbs/ft)	79,641	68,368	58,973	51,137	44,586	39,093	34,465	30,548	27,216	24,367
	R (lbs/ft)	7,493	6,859	6,245	5,668	5,135	4,651	4,214	3,822	3,474	3,163
22	Ps (psf)	159	184	204	217	225	228	227	223	217	210
	α (radians)	0.49	0.55	0.62	0.67	0.73	0.77	0.82	0.86	0.90	0.93
	β (radians)	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.14
	Z̄ (ft)	9.89	10.64	11.24	11.73	12.14	12.47	12.74	12.97	13.17	13.33
	M (ft-lbs/ft)	94,986	82,497	71,913	62,945	55,341	48,878	43,370	38,658	34,611	31,122
	R (lbs/ft)	7,842	7,260	6,684	6,131	5,611	5,128	4,685	4,283	3,918	3,590
24	Ps (psf)	133	157	176	191	202	207	210	209	206	201
	α (radians)	0.45	0.52	0.58	0.63	0.68	0.73	0.78	0.82	0.85	0.89
	β (radians)	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.16	0.15
	Z̄ (ft)	10.35	11.19	11.87	12.44	12.90	13.29	13.62	13.89	14.13	14.32
	M (ft-lbs/ft)	110,969	97,366	85,670	75,625	66,997	59,577	53,183	47,661	42,875	38,716
	R (lbs/ft)	8,132	7,600	7,064	6,540	6,037	5,564	5,122	4,715	4,342	4,001
26	Ps (psf)	112	134	153	168	180	188	192	194	193	191
	α (radians)	0.42	0.48	0.54	0.60	0.65	0.69	0.74	0.78	0.82	0.85
	β (radians)	0.28	0.27	0.25	0.23	0.22	0.20	0.19	0.17	0.16	0.15
	Z̄ (ft)	10.78	11.69	12.45	13.09	13.62	14.07	14.44	14.77	15.04	15.28
	M (ft-lbs/ft)	127,485	112,863	100,135	89,071	79,460	71,105	63,836	57,499	51,963	47,113
	R (lbs/ft)	8,376	7,890	7,393	6,899	6,418	5,959	5,524	5,118	4,741	4,393
28	Ps (psf)	94	114	132	148	160	169	175	179	180	180
	α (radians)	0.40	0.46	0.51	0.56	0.61	0.66	0.70	0.74	0.78	0.81
	β (radians)	0.27	0.26	0.24	0.23	0.21	0.20	0.19	0.17	0.16	0.15
	Z̄ (ft)	11.17	12.16	12.99	13.70	14.29	14.80	15.23	15.60	15.91	16.19
	M (ft-lbs/ft)	144,448	128,896	115,211	103,191	92,642	83,385	75,258	68,113	61,823	56,274
	R (lbs/ft)	8,581	8,137	7,677	7,214	6,758	6,315	5,892	5,491	5,115	4,764
30	Ps (psf)	80	98	115	130	142	152	160	165	167	168
	α (radians)	0.37	0.43	0.48	0.53	0.58	0.63	0.67	0.71	0.74	0.78
	β (radians)	0.26	0.25	0.23	0.22	0.21	0.20	0.18	0.17	0.16	0.15
	Z̄ (ft)	11.52	12.59	13.49	14.26	14.92	15.48	15.97	16.38	16.75	17.06
	M (ft-lbs/ft)	161,789	145,388	130,819	117,903	106,466	96,343	87,381	79,443	72,404	66,153
	R (lbs/ft)	8,755	8,349	7,925	7,492	7,060	6,636	6,227	5,834	5,462	5,112
32	Ps (psf)	69	85	101	115	127	137	145	151	155	157
	α (radians)	0.35	0.41	0.46	0.51	0.55	0.60	0.64	0.68	0.71	0.75
	β (radians)	0.25	0.24	0.22	0.21	0.20	0.19	0.18	0.17	0.16	0.15
	Z̄ (ft)	11.85	12.98	13.95	14.79	15.51	16.13	16.67	17.13	17.54	17.89
	M (ft-lbs/ft)	179,452	162,274	146,888	133,136	120,859	109,909	100,144	91,432	83,655	76,706
	R (lbs/ft)	8,904	8,532	8,140	7,736	7,329	6,925	6,531	6,150	5,785	5,438

GUIDELINE & WEBSITE DIRECTORY

BNSF guidelines are as follows:

- a. Guidelines for Design and Construction of Grade Separation Structures.

UPRR guidelines are as follows:

- a. **Underpass Structures** – “Guidelines for Design and Construction of Grade Separation Underpass Structures.”
- b. **Overhead Grade Separation** – “Guidelines for Design of Highway Separation Structures Over Railroad (Overhead Grade Separation).”
- c. **Demolition** – “Guidelines for Preparation of a Bridge Demolition and Removal Plan for Structures Over Railroad.”
- d. **Shoofly** – “Guidelines for Design and Construction of Shoofly (Detour) Tracks.”
- e. **Fiber Optic** – “UPRR Fiber Optic Engineering, Construction And Maintenance Standards.”
1/1/2002
- f. **Pipeline** – “Pipeline Installation” available at www.uprr.com.
- g. **Industry Track** – “Technical Specification for Construction of Industrial Tracks”

WEBSITE DIRECTORY:

1. www.astm.org
2. www.arena.org
3. www.bnsf.com
4. www.pilespecs.com
5. www.uprr.com

AREMA Table 8-20-1. Granular Soils

Descriptive Term for Relative Density	Standard Penetration Test Blows per Foot "N"
Very Loose	0 - 4
Loose	4 - 10
Medium	10 - 30
Dense	30 - 50
Very Dense	Over 50

AREMA Table 8-20-2. Silt and Clay Soils

Descriptive Term for Consistency	Unconfined Compressive Strength Tons per Square Foot
Very Soft	Less than 0.25
Soft	0.25 - 0.50
Medium	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	Over 4.00

AREMA Table 8-20-3. Unit Weights of Soils, and Coefficients of Earth Pressure

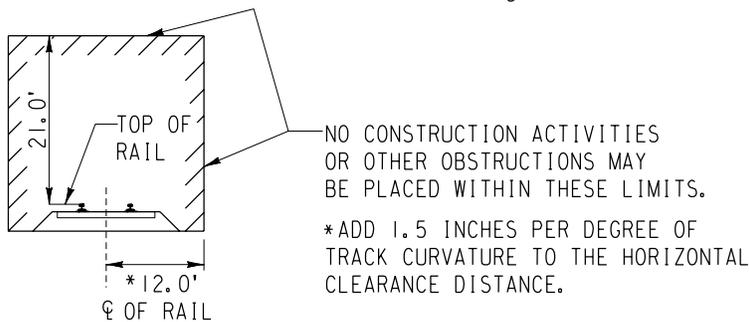
Type of Soil	Unit Weight of Moist Soil, γ (Note 1)		Unit Weight of Submerged Soil, γ' (Note 1)		Coefficient of Active Earth Pressure, K_A				Coefficient of Passive Earth Pressure, K_p		
	Minimum	Maximum	Minimum	Maximum	For Backfill	For Soils in Place	Friction Angles (Note 2)		For Soils in Place	Friction Angles (Note 2)	
							ϕ	δ		ϕ	δ
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Clean Sand:											
Dense	110	140	65	78		0.20	38	20	9.0	38	25
Medium	110	130	60	68		0.25	34	17	7.0	34	23
Loose	90	125	56	63	0.35	0.30	30	15	5.0	30	20
Silty Sand:											
Dense	110	150	70	88		0.25			7.0		
Medium	95	130	60	68		0.30			5.0		
Loose	80	125	50	63	0.50	0.35			3.0		
Silt and Clay (Note 3)	$\frac{165(1+w)}{1+2.65w}$		$\frac{103}{1+2.65w}$		1.00	$1 - \frac{q_u}{p + \gamma z}$			$1 + \frac{q_u}{p + \gamma z}$		
<p>Note 1: In pounds per cubic foot.</p> <p>Note 2: These angles, expressed in degrees, are ϕ, the angle of internal friction, and δ, the angle of wall friction, and are used in estimating the coefficients under which they are listed.</p> <p>Note 3: The symbol γ represents γ or γ', whichever is applicable; p is the effective unit pressure on the top surface of the stratum; q_u is the unconfined compressive strength; w is the natural water content, in percentage of dry weight; and z is the depth below the top surface of the stratum.</p>											

General criteria:

- a. Design loads to be based on the AREMA manual and Cooper E80 loading.
- b. Pressure due to embankment surcharges.
- c. ASTM designation and yield strength for each material.
- d. Maximum allowable bending stress for steel is 0.55Fy.
- e. Temporary overstress allowances are not acceptable.
- f. All timber members shall be Douglas Fir Grade 2 or better.
- g. Insitu soil classification.
- h. Backfill soil classification.
- i. Internal angle of friction and unit weight of soil.
- j. Active and passive soil coefficients.
- k. Backfill compacted to a minimum of 95% Proctor density per ASTM D-1557.
- l. Slopes without shoring shall not be steeper than 2 horizontal to 1 vertical.
- m. Dredge line elevation.
- n. Shoring deflection to be calculated and meet Railroad requirements.

Miscellaneous:

- a. Project name, location, GPS coordinates, track owner, Railroad line segment, milepost and subdivision in the title block.
- b. Procedure outlining the installation and removal of the temporary shoring system.
- c. General notes specifying material requirements, design data, details, dimensions and cross-sections, sequence of construction etc.
- d. A description of tieback installation including drilling, grouting, stressing information and testing procedures, anchor capacity, type of tendon, anchorage hardware, minimum unbonded lengths, minimum anchor lengths, angle of installation, tieback locations and spacing.
- e. All details for construction of drainage facilities associated with the shoring system shall be clearly indicated.
- f. Details and descriptions of all shoring system members and connection details.
- g. Settlement and displacement calculations.
- h. Handrail and protective fence details along the excavations.
- i. Drawings must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed.
- j. Call before you dig number.
- k. Construction clearances diagram as shown below.



MINIMUM CONSTRUCTION

CLEARANCES (NORMAL TO RAILROAD) Not to scale	DESIGN BY:	NAME & LOGO OF ENGINEERING FIRM OR PROJECT OWNER		
	DRAWN BY:			
	SCALE:	GENERAL CRITERIA AND MISCELLANEOUS		
	DRAWING NO:	RR M.P.	SUBDIVISION	
	SHEET: 1 of 3	CITY	COUNTY	STATE
	DOT#:	PROJECT NAME & LOCATION		
	DATE:			

General plan view should show:

- a. Railroad right-of-way and North arrow.
- b. Position of all Railroad tracks and identify each track as mainline, siding, spur, etc.
- c. Spacing between all existing tracks.
- d. Location of all access roadways, drainage ditches and direction of flow.
- e. Footprint of proposed structure, proposed shoring system and any existing structures if applicable.
- f. Proposed horizontal construction clearances. The minimum allowable is 12 feet measured at a right angle from centerline of track.
- g. Location of existing and proposed utilities.
- h. Drawings must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed.
- i. Railroad and other "CALL BEFORE YOU DIG" numbers.
- j. Detailed view of shoring along with controlling elevations and dimensions.

DESIGN BY:	NAME & LOGO OF ENGINEERING FIRM OR PROJECT OWNER		
DRAWN BY:			
SCALE:	GENERAL PLAN VIEW		
DRAWING NO:			
SHEET: 2 OF 3	RR M.P.	SUBDIVISION	
DOT#:	city	COUNTY	STATE
DATE:	PROJECT NAME & LOCATION		

Typical section and elevation should show:

- a. Top of rail elevations for all tracks.
- b. Offset from the face of shoring system to the centerline of all tracks at all changes in horizontal alignment.
- c. All structural components, controlling elevations and dimensions of shoring system.
- d. All drainage ditches and controlling dimensions.
- e. All slopes, existing structures and other facilities which may surcharge the shoring system.
- f. Location of all existing and proposed utilities.
- g. Total depth of shoring system.

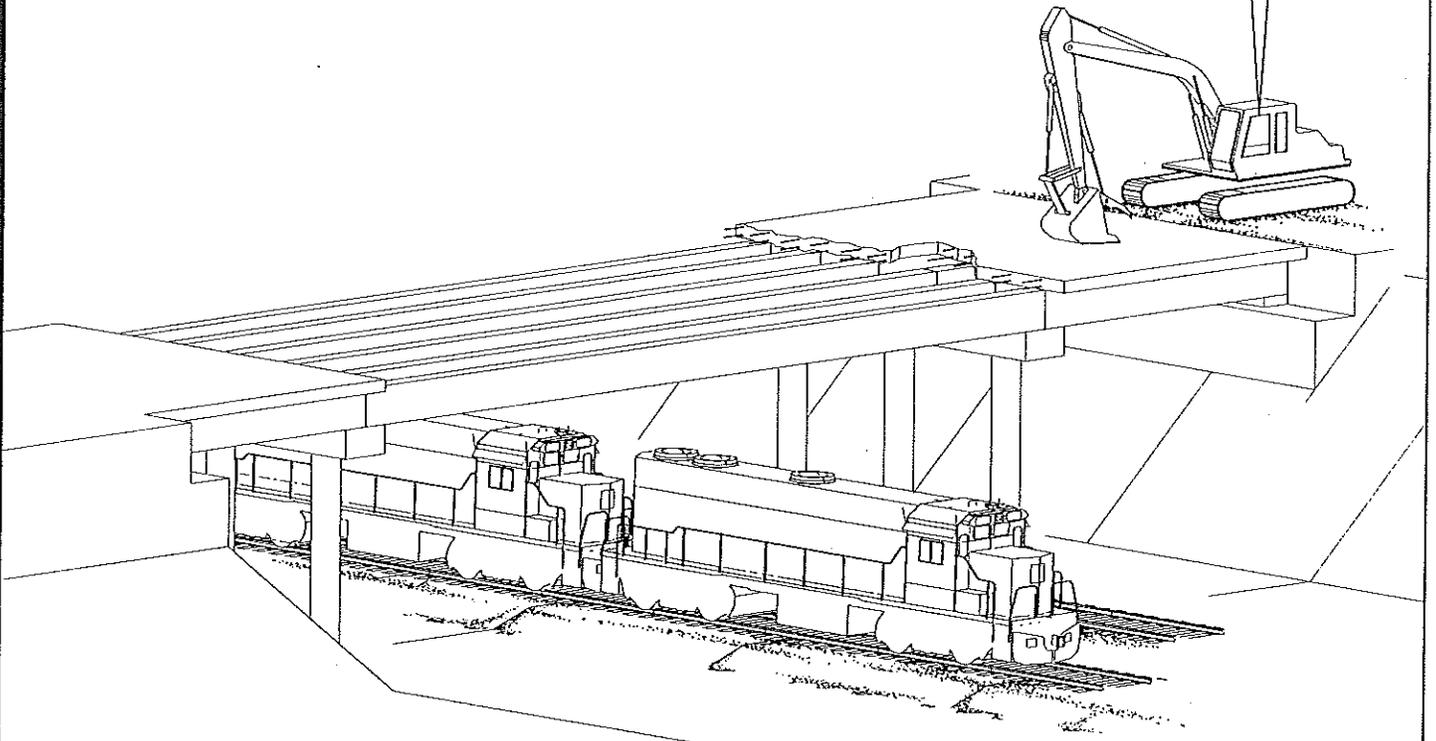
DESIGN BY:	NAME & LOGO OF ENGINEERING FIRM OR PROJECT OWNER		
DRAWN BY:			
SCALE:	TYPICAL SECTION & ELEVATION VIEW		
DRAWING NO:			
SHEET: 3 of 3	RR M.P.	SUBDIVISION	
DOT#:	CITY	COUNTY	STATE
DATE:	PROJECT NAME & LOCATION		

EXHIBIT G

Railroad's Demolition Guidelines for Overpass Structure

GUIDELINES FOR PREPARATION OF A BRIDGE DEMOLITION AND REMOVAL PLAN FOR STRUCTURES OVER RAILROAD

STOP ALL WORK
DURING RAIL OPERATIONS



UNION PACIFIC RAILROAD

OFFICE OF CHIEF ENGINEER DESIGN
1416 DODGE ST.
OMAHA, NE 68179

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I. GENERAL

- A. The Contractor's work shall in no way impede the train operations of the Union Pacific Railroad.
- B. The Contractor shall develop a work plan assuming that minimal track windows will be available.
- C. The Contractor shall be responsible for planning and executing all procedures necessary to remove the overhead bridge in a safe and controlled manner.
- D. The Railroad's tracks and property shall be protected at all times.
- E. The contractor shall ensure the area immediately adjacent to operational tracks shall remain free from stumble or like hazards to the ground Railroad personnel to prevent injuries. Open excavations shall be in accordance with current CE Drawing 106613 and shall be protected by appropriate fencing.
- F. The words "demolition" and "removal" will be used interchangeably.
- G. All removed materials shall be disposed of outside the Railroad right-of-way at no expense to the Railroad.
- H. No work is allowed within 50 feet of the nearest rail when trains pass the work site.
- I. Staged demolition of the portions of structure immediately adjacent to operational tracks will not jeopardize the integrity of the structure over said tracks until actual removal of the portion of the structure over the tracks is being done.
- J. A flagman is required when any work is performed within 25 feet of the nearest rail.
- K. No blasting will be permitted on Railroad's right-of-way.

II. BRIDGE REMOVAL PLAN

- A. The Contractor shall submit a complete Bridge Removal Plan to the Railroad. The Bridge Removal Plan shall include details, procedures and the sequence of staged removal of the bridge, including all steps necessary to remove the bridge in a safe and controlled manner.

- B. The Contractor shall submit to the Railroad; three (3) complete sets of the Bridge Removal Plan for review and comments. The Plan shall be sealed by a Civil or Structural Engineer registered in the state where the proposed demolition will take place. A minimum of three (3) weeks shall be allowed for the Railroad's review after the complete submittal is received. No removal operations will be permitted over the Railroad right of way until the submitted material has been reviewed and comments provided.
- C. Review and comment of the Removal Plan by the Railroad will not relieve the Contractor of the ultimate responsibility and liability for the demolition of the structure.
- D. The Removal Plan shall include the following:
- 1) Plan, elevation and location of the bridge, and the locations of any access roads needed for movement of the equipment. The as-built drawings may be used for the submittal provided the removal steps are clearly marked and legible.
 - 2) Indicate the position of all railroad tracks below the bridge and identify each track as mainline, siding, spur, etc.
 - 3) Bridge removal sequence and procedures for entire bridge including the staging for the removal of the superstructure and substructure.
 - 4) List type and number of equipment required and their locations during demolition operations.
 - 5) Locations and types of temporary supports, shoring or bracing required. These members shall be designed to meet Union Pacific Railroad current standard drawing 106613 "General Shoring Requirements", "Guidelines for Design and Construction of Falsework for Structures Over Union Pacific Railroad", "Guidelines for Design and Construction of Shoring Adjacent to Active Railroad Tracks", and the appropriate local and national building and design code requirements.
 - 6) The proposed vertical and horizontal clearance from all tracks to the temporary and permanent supports. The minimum vertical and horizontal clearances shall be as per attached frame protection details.
 - 7) If any temporary supports interfere with the natural drainage along the Railroad right-of-way, a temporary drainage plan shall be submitted for review and comment prior to constructing temporary supports. The proposed drainage plan shall route all drainage away from the railroad tracks.

- 8) Details, limits, and locations of protective covers or other measures proposed to be used to protect the tracks. This includes any shields or other measures that will protect the tracks from falling debris during removal of the overhead bridge and from any debris rolling down the side slopes or otherwise coming into the area around the tracks which could affect train operations. Design loads, including impact loads, shall be noted. In addition equipment should be on site capable of removing debris and track shield from operational tracks.
- 9) All procedures necessary to remove the bridge in a safe and controlled manner. The estimated time for complete removal over the tracks shall be noted.
- 10) All overhead and underground utilities in the area affected by removal of the bridge shall be located on the drawings, including any fiber optic, railroad signal, and communication lines.
- 11) The location and details of track crossings required for moving of the equipment across the railroad tracks.
- 12) Limits of demolition of substructures.
- 13) Details of on-site fire suppression.

III. PROCEDURE

- A. During removal operations the remaining structure shall be stable during all stages of the removal operations.
- B. Prior to proceeding with bridge removal the sealing Civil or Structural Engineer, or his authorized representative working for the Contractor, shall inspect the temporary support shoring, including temporary bracing and protective coverings, for conformity with the working drawings. The Engineer shall certify in writing to the Railroad that the work is in conformance with the drawings and that the materials and workmanship are satisfactory. A copy of this certification shall be available at the site of work at all times.
- C. Coordinate the removal schedule with the Railroad. All the removal work within the track area shall be performed during the time windows when the trains are not passing the work site.
- D. All substructures shall be removed to at least 3 feet below the final finished grade or at least 2 feet below base of rail whichever is lower, unless otherwise specified by the Railroad.

- E. All debris and refuse resulting from the work shall be removed from the right of way by the contractor and the premises left in a neat and presentable condition.
- F. The work progress shall be reviewed and logged by the Contractor's Engineer. Should an unplanned event occur, the Contractor shall inform the Railroad and submit procedure to correct or remedy the occurrence.
- G. Preferably all demolition and beam removal shall be from above. In the case that the beams require removal from below, the beams may temporarily straddle the tracks. The following steps shall be taken:
 - 1) The work shall be scheduled with the Railroad's Service Unit Superintendent subject to the Railroad's operational requirements for continuous train operations. The beams removed in sufficient time for train passage.
 - 2) The tracks shall be protected and no equipment placed on the tracks.
 - 3) The beams shall be blocked and not come in contact with the tracks. Blocking shall not be placed on the tracks.
 - 4) The beams and all equipment will be moved a minimum of 15 feet from the nearest rail of the tracks when a train is passing.

IV. TRACK PROTECTION

- A. The track protective cover shall be constructed before beginning bridge removal work and may be supported by falsework or members of the existing structure. See the attached Track Shield Detail and Frame Protection Detail for additional requirements. Types of protective covers that may be acceptable methods for protecting the tracks are:
 - 1) A decking supported by the bridge or a suspended cover from the bridge above the track clearance envelope.
 - 2) A track shield cover over the tracks per the attached detail.
 - 3) A framed cover outside the track clearance envelope.
 - 4) A catcher box or loader bucket under decking and parapets overhanging the exterior girders.
- B. Construction equipment shall not be placed on the tracks unless tracks are protected.

- C. Temporary haul road crossings shall be either Section Timbers or Precast Concrete Panels. The type of crossing shall be determined by the Manager of Industry and Public Projects. Solid timbers or ballast with timber headers shall be used between multiple tracks. If temporary crossing is accessible to public crossing shall be protected with barricades or locked gates when contractor is not actively working at the site or weekends.
- D. Track protection is required for all equipment including rubber tired equipment operating within 25 ft. or over the tracks.

V. CRANES

- A. When cranes are operated near the tracks the following is required:
 - 1) Only cranes with the capacity to handle the loads may be used. Front end loaders and backhoes cannot be used to lift over the tracks.
 - 2) The Contractor shall verify that the foundations under the crane can support the loads.
 - 3) The size and material type of crane mats shall be submitted to the Railroad for review and comment. No mat substitution will be allowed. The mats shall be rigid and of sufficient capacity to distribute the crane loads and prevent tipping of the crane.
 - 4) Installation of temporary track crossings for equipment shall be scheduled with the Manager of Industry and Public Projects .
 - 5) Additional track protection is required when crossing with a crane. The protection methods shall be submitted to the Railroad for review and comment.
 - 6) Equipment shall not place outriggers on the tracks or ballast.
 - 7) Cranes shall not be placed within the track clearance envelope without flagman protection.

VI. CUTTING TORCHES

- A. When a cutting torch is used near the tracks or any timber, the following steps shall be taken:
- 1) Fire suppression equipment is required on-site.
 - 2) Do not use a torch over, between, or adjacent to the tracks unless a steel plate protective cover is used. Care shall be taken to make certain the use of a steel plate does not come in contact with the rails. See "Track Shield Details" for other requirements. Details of the shield shall be submitted to the Railroad for approval.
 - 3) Wet the ties and other timber below the cutting area.
 - 4) Monitor the work site for at least three hours after cutting for a smoldering fire.
- B. Extensive overhead cutting will not be performed over the track area without the proper fire suppression equipment on-site and proper protection.

VII. UTILITIES

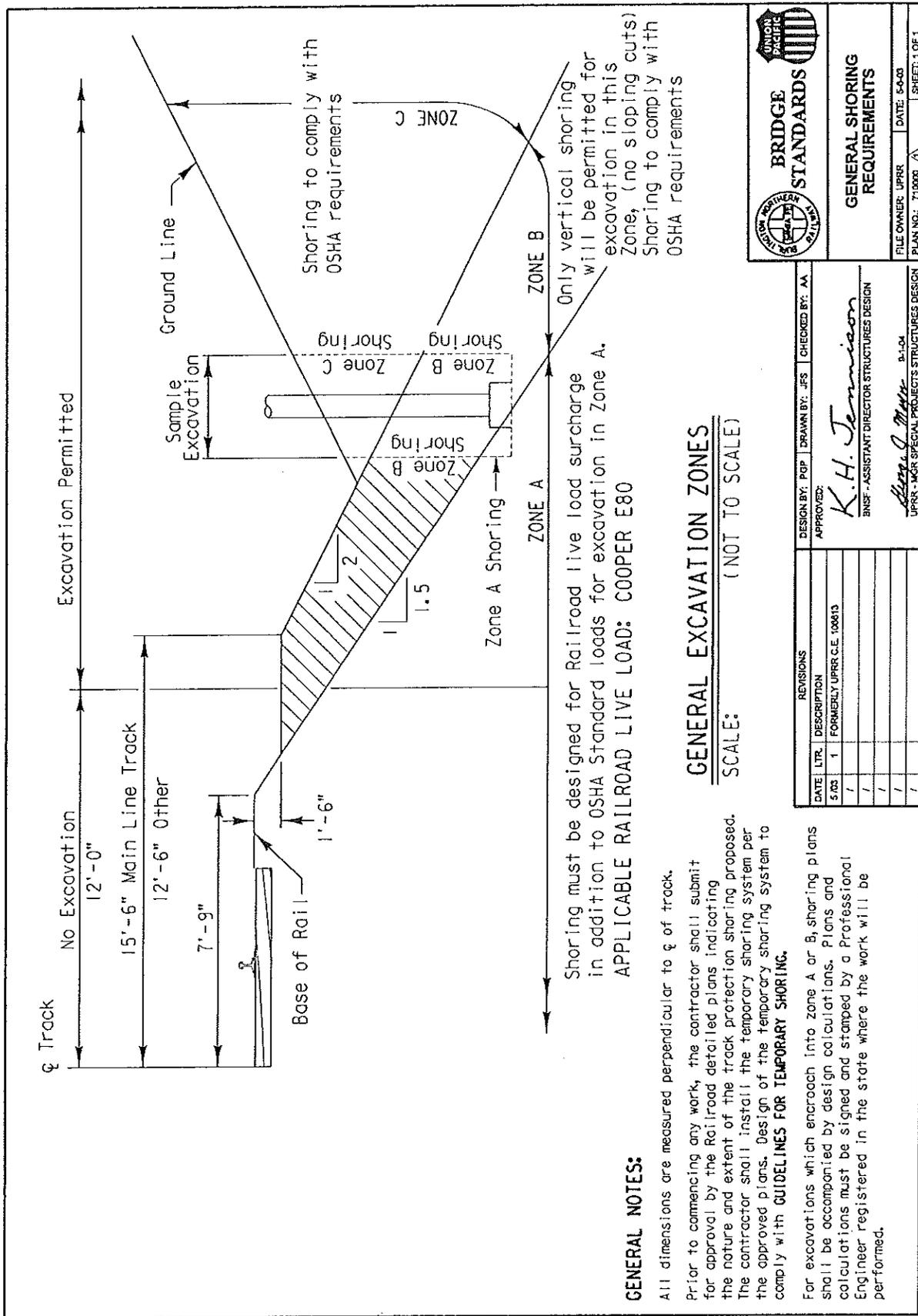
- A. The demolition operations shall be planned such that the utility lines are operating safely at all times. The utility lines shall be protected if affected by demolition operations. All the work associated with utility lines should be coordinated by the contractor with the respective utility companies.

VIII. HAZARDOUS MATERIAL

- A. If any hazardous materials are found, provide material protection as specified in local hazardous material codes and immediately contact the Railroad.

APPENDIX

- GENERAL SHORING REQUIREMENTS
- LIVE LOAD PRESSURE DUE TO COOPER E80
- TRACK SHIELD DETAIL
- FRAME PROTECTION DETAILS, sheet 1 of 2
- FRAME PROTECTION DETAILS, sheet 2 of 2



GENERAL NOTES:

All dimensions are measured perpendicular to ϕ of track.

Prior to commencing any work, the contractor shall submit for approval by the Railroad detailed plans indicating the nature and extent of the track protection shoring proposed. The contractor shall install the temporary shoring system per the approved plans. Design of the temporary shoring system to comply with **GUIDELINES FOR TEMPORARY SHORING**.

For excavations which encroach into Zone A or B, shoring plans shall be accompanied by design calculations. Plans and calculations must be signed and stamped by a Professional Engineer registered in the state where the work will be performed.

Shoring must be designed for Railroad live load surcharge in addition to OSHA Standard loads for excavation in Zone A.

APPLICABLE RAILROAD LIVE LOAD: COOPER E80

GENERAL EXCAVATION ZONES
SCALE: (NOT TO SCALE)

DATE	REVISIONS	DESIGN BY: POP	DRAWN BY: JFS	CHECKED BY: AA
5/03	1	FORMERLY UPRR C.E. 100413		
/	/			
/	/			
/	/			

APPROVED: *K.H. Tennison*
 BNSF - ASSISTANT DIRECTOR STRUCTURES DESIGN

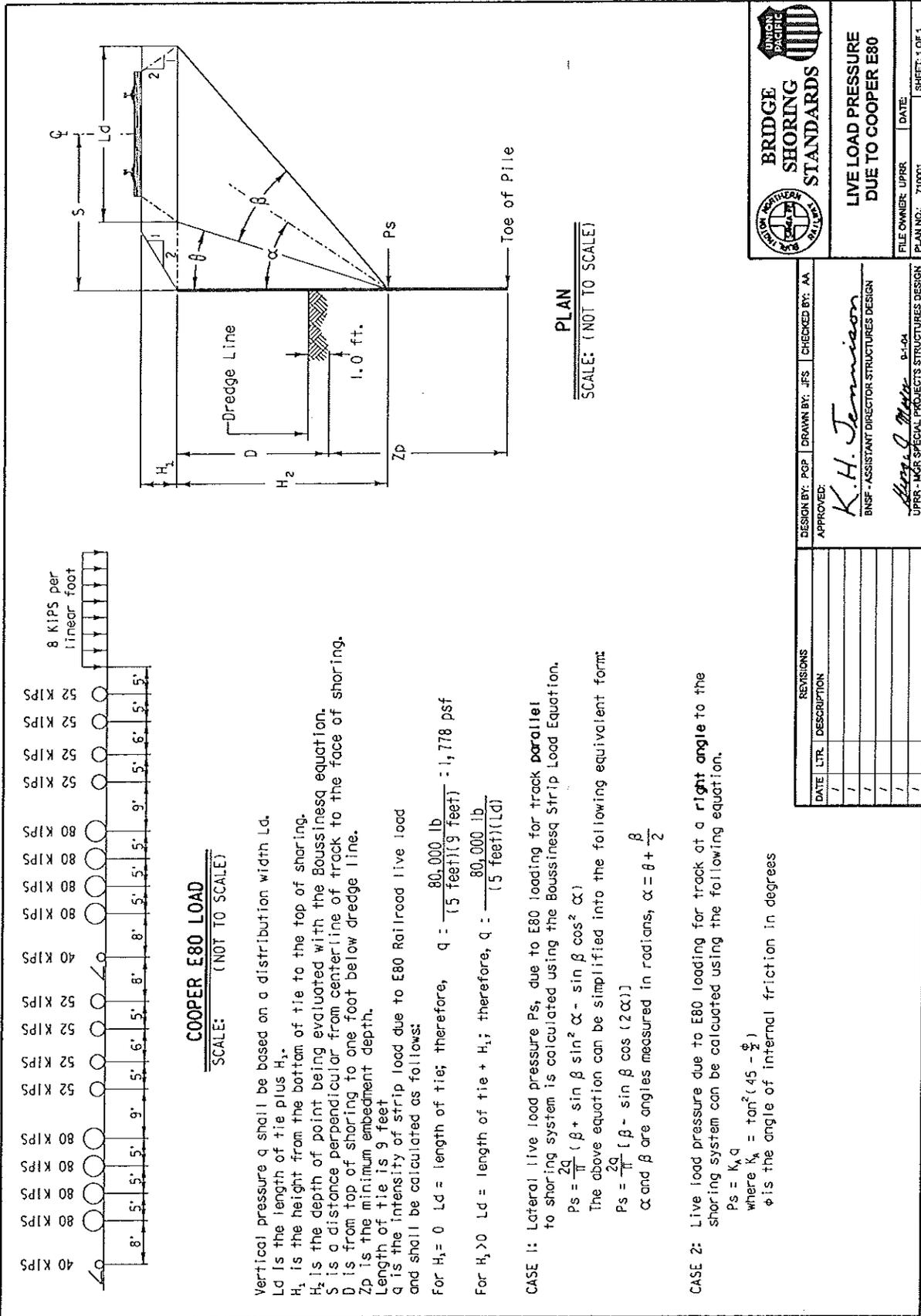
Bernard J. Meyer 5-1-04
 UPRR - MOR SPECIAL PROJECTS STRUCTURES DESIGN

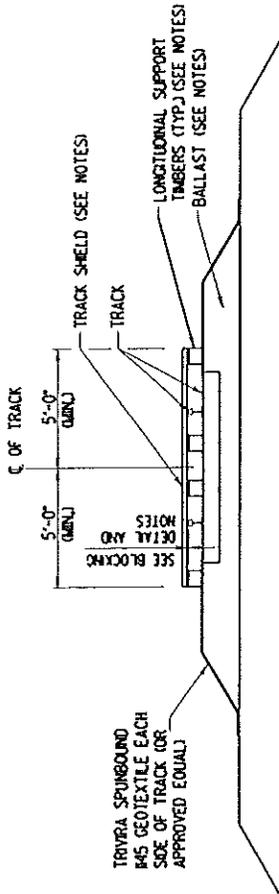
BRIDGE STANDARDS

GENERAL SHORING REQUIREMENTS

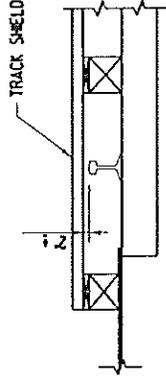
FILE OWNER: UPRR DATE: 5-03 SHEET: 1 OF 1
 PLAN NO.: 710000 KOTIUC: 8334241343 STIK

Figure 1





**TRACK SHIELD DETAIL
FOR DEBRIS FALLING FROM BRIDGE DECK REMOVAL
(WHEN TRACK TIME WINDOW IS AVAILABLE)**



BLOCKING DETAIL

NOTES:

1. A FLAGMAN IS REQUIRED AT ALL TIMES DURING THE USE OF A TRACK SHIELD.
2. THE TRACK SHIELD SHALL BE DESIGNED BY THE CONTRACTOR AND SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOADS, INCLUDING IMPACT. THE SHIELD SHALL PREVENT ANY MATERIALS, EQUIPMENT OR DEBRIS FROM FALLING ONTO THE RAILROAD TRACK. ADDITIONAL LAYERS OF MATERIALS SHALL BE FURNISHED AS NECESSARY TO PREVENT FINE MATERIALS OR DEBRIS FROM SETTING DOWN UPON THE TRACK.
3. THE SHIELD SHOULD PREFERABLY BE PREFABRICATED AND FURNISHED WITH LIFTING HOOKS TO SIMPLIFY REMOVAL.
4. THE SHIELD SHALL BE OF SUFFICIENT STRENGTH TO SPAN BETWEEN IT'S SUPPORTS WITHOUT BEARING UPON THE RAILS AND TO WITHSTAND DROPPING RUBBLE.
5. BEFORE REMOVAL, THE SHIELD SHALL BE CLEANED OF ALL DEBRIS AND FINE MATERIAL.
6. THE TRACK SHIELD SHALL EXTEND AT LEAST 20 FEET BEYOND THE LIMITS OF DEMOLITION TRANSVERSE TO THE EDGE OF THE BRIDGE.
7. LONGITUDINAL SUPPORT TIMBERS FOR THE SHIELD SHALL NOT EXTEND ABOVE THE TOP OF RAIL WHEN THE SHIELD IS REMOVED. BLOCKING FROM THE TOP OF RAIL TO THE BOTTOM OF THE SHIELD MAY BE ATTACHED TO THE SHIELD. REMAINING TIMBERS SHALL BE ANCHORED.
8. FOR TRAIN PASSAGE, THE RUBBLE SHALL BE REMOVED TO A MINIMUM OF 8' 6" FROM THE NEAREST RAIL AND TO AN ELEVATION NO HIGHER THAN THE TOP OF RAIL.
9. AT THE END OF THE DAY, THE RUBBLE SHALL BE REMOVED COMPLETELY TO A MINIMUM OF 10' 0" FROM THE NEAREST RAIL AND DOWN TO ORIGINAL GRADE.
10. CARE SHALL BE TAKEN TO NOT PLACE METAL ACROSS THE TRACK RAILS. RAILROAD COMMUNICATIONS ARE SENT THROUGH THE RAILS AND WILL BE DISRUPTED BY A SHORT BETWEEN RAILS.
11. DETAILS SHOWN APPLY FOR TIMBER TIES. SPECIAL DETAILS ARE REQUIRED FOR CONCRETE TIES.



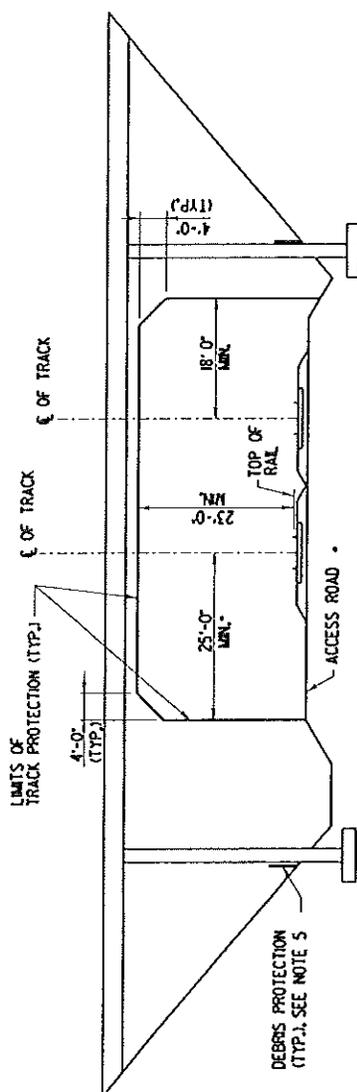
UNION PACIFIC RAILROAD

TRACK SHIELD DETAIL

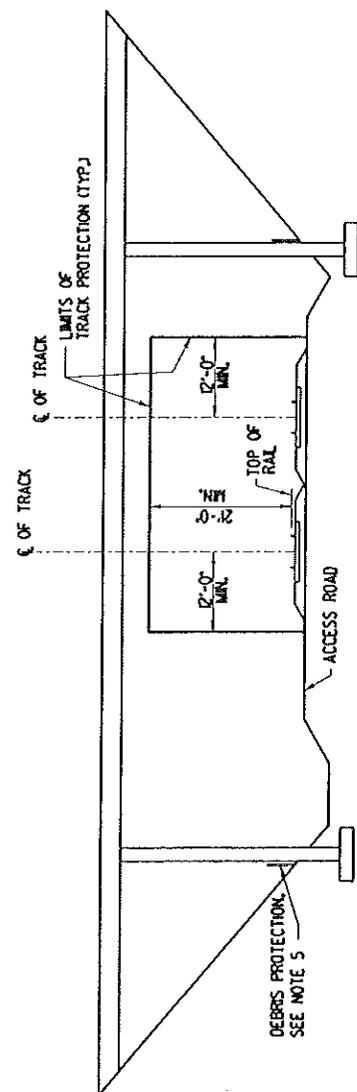
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

SHEET 1 OF 1



BRIDGE ELEVATION
STANDARD LIMITS OF PROTECTION FOR FRAME PROTECTION



BRIDGE ELEVATION
MINIMUM LIMITS OF PROTECTION FOR FRAME PROTECTION
(SPECIAL PERMISSION REQUIRED, SEE NOTE D)

NOTES:

1. THE STANDARD LIMITS OF PROTECTION NOTED ARE THE MIN. CLEARANCES ALLOWED WITHOUT SPECIAL PERMISSION FROM THE RAILROAD. THE REDUCED CLEARANCES NOTED MAY BE ALLOWED BY THE RAILROAD. SPECIAL PERMISSION FOR THE REDUCED CLEARANCES IS REQUIRED FROM THE RAILROAD SERVICE UNIT SUPERINTENDENT.
2. THE PROTECTION FRAME SHALL AS A MINIMUM MATCH THE DEMOLITION LIMITS SHOWN AND EXTEND PAST THE BRIDGE WIDTH AS SHOWN ON THE ATTACHED DEMOLITION PLAN SHEET.
3. FOR ADDITIONAL CLEARANCE AND PROTECTION INFORMATION, SEE UNION PACIFIC RAILROAD STANDARD DRAWING NO. 0035
4. THE PROTECTION FRAME SHALL PREVENT DEMOLITION DEBRIS, DUST AND FINE MATERIAL FROM FALLING ONTO THE RAILROAD TRACKS, ACCESS ROAD OR TRANS. THE FRAME SHALL BE DESIGNED BY THE CONTRACTOR TO SUPPORT THE ANTICIPATED DEMOLITION LOADS, AND IN ACCORDANCE WITH UNION PACIFIC GUIDELINES FOR DESIGN OF FALSEWORK FOR STRUCTURES OVER THE RAILROAD.
5. DEBRIS PROTECTION IS REQUIRED NEAR THE BASE OF THE SIDE SLOPES AND ADJACENT TO ROADS USED BY DEMOLITION EQUIPMENT TO PREVENT DEBRIS FROM ROLLING ONTO THE TRACK, ACCESS ROAD OR DITCH. USE TIMBERS AS REQUIRED TO STOP LARGE PIECES OF ROLLING DEBRIS.
6. ANY ACTIVITY WITHIN 25 FEET OF THE NEAREST RAIL OF A TRACK REQUIRES A FLAGMAN.

* IF NO ACCESS ROAD, USE MIN. DIMENSION FROM OTHER SIDE OF DETAIL.



UNION PACIFIC RAILROAD

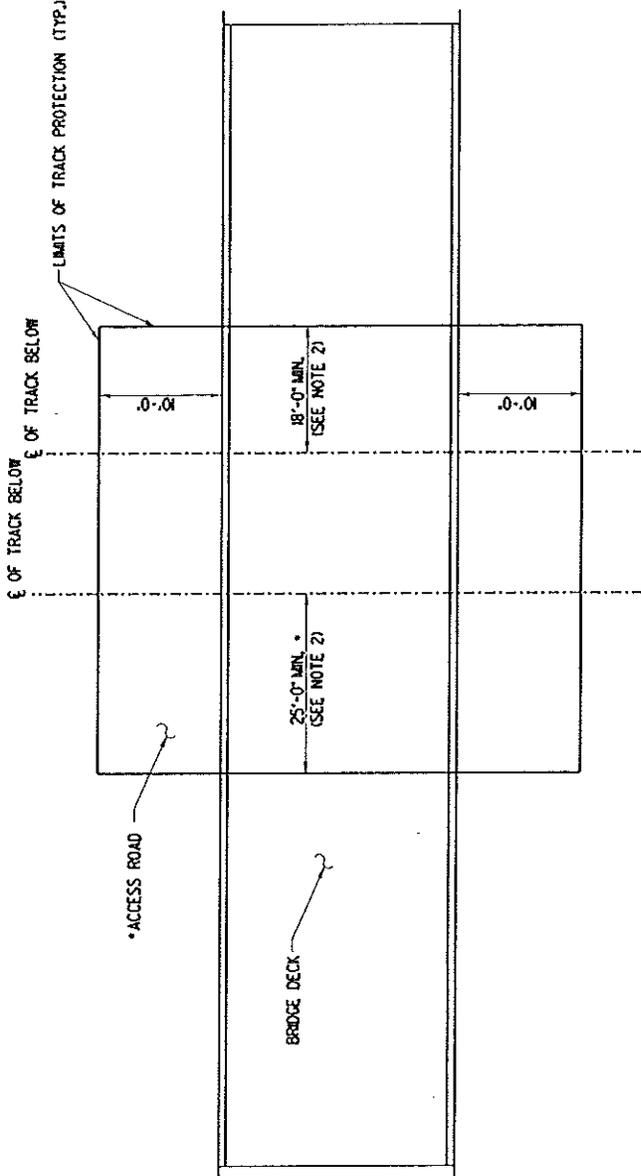
FRAME PROTECTION DETAILS

OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

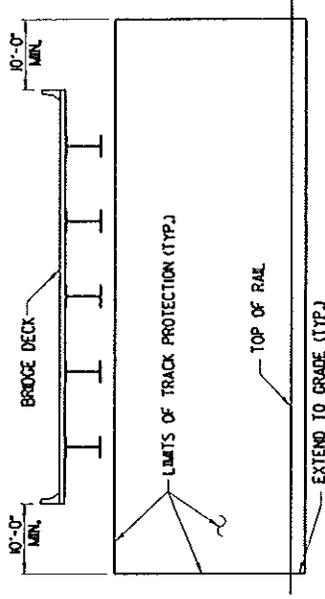
SHEET 1 OF 2

- NOTES:
1. SEE GENERAL NOTES ON BRIDGE ELEVATION SHEET
 2. STANDARD LIMITS OF PROTECTION ARE SHOWN FOR MIN. LIMITS OF PROTECTION DIMENSIONS. SEE BRIDGE ELEVATION, MINIMUM LIMITS OF PROTECTION.



BRIDGE PLAN
STANDARD LIMITS OF PROTECTION FOR FRAME PROTECTION

* F NO ACCESS ROAD, USE MIN. DIMENSION FROM OTHER SIDE



BRIDGE DECK CROSS SECTION
STANDARD LIMITS OF PROTECTION

* F NO ACCESS ROAD, USE MIN. DIMENSION FROM OTHER SIDE



UNION PACIFIC RAILROAD

FRAME PROTECTION DETAILS
OFFICE OF CHIEF ENGINEER DESIGN

DATE: 3-31-98

SHEET 2 OF 2

EXHIBIT H

CALTRANS **RIGHT OF ENTRY AGREEMENT**

THIS AGREEMENT is made and entered into as of the ____ day of _____, 201_, by and between **UNION PACIFIC RAILROAD COMPANY (UPRR)** (hereinafter "Railroad") and **STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION** (hereinafter "Licensee").

IT IS MUTUALLY AGREED BY AND BETWEEN THE PARTIES HERETO AS FOLLOWS:

ARTICLE 1 - DEFINITION OF LICENSEE

For purposes of this Agreement, all references in this Agreement to Licensee shall include Licensee's contractors, subcontractors, officers, agents and employees, and others acting under its or their authority.

ARTICLE 2 - RIGHT GRANTED; PURPOSE

Railroad hereby grants to Licensee the right, during the term hereinafter stated and upon and subject to each and all of the terms, provisions and conditions herein contained, to enter upon and have ingress to and egress from the portion of Railroad's property located at or near Milepost 293.83, on Railroad's Canyon Subdivision located near Quincy, Plumas County, California, for the purpose of performing work relating to construction, reconstruction, use, maintenance and repair of a highway overhead bridge structure for United States Highway 70 (the "Work") as such location is also shown on the print, marked **Exhibit A**, attached hereto and hereby made a part hereof. The right herein granted to Licensee is limited to those portions of Railroad's property specifically described herein, or designated by the Railroad representative named in Article 4.

ARTICLE 3 - TERMS AND CONDITIONS CONTAINED IN EXHIBITS B, C, D AND E

The terms and conditions contained in **Exhibit B**, **Exhibit C**, **Exhibit D**, and **Exhibit E**, attached hereto, are hereby made a part of this agreement.

ARTICLE 4 - ALL EXPENSES TO BE BORNE BY LICENSEE; RAILROAD REPRESENTATIVE

A. Licensee shall bear any and all costs and expenses associated with any work performed by Licensee, or any costs or expenses incurred by Railroad relating to this Agreement.

B. Licensee shall coordinate all of its work with the following Railroad representative or his/her duly authorized representative (the "Railroad Representative"):

Kevin Yoder
Manager Industry and Public Projects
Union Pacific Railroad Company
9451 Atkinson Street
Roseville, CA 95747
Phone: (916) 789-5152
E-mail: kayoder@up.com

C. Licensee, at its own expense, shall adequately monitor that its contractors are performing all Work to be performed under construction contracts for the Structure work. Licensee shall require that such Work is performed in a safe manner as set forth in Section 7 of **Exhibit B**. The responsibility of Licensee's for requiring safe conduct and adequate monitoring and supervision of Contractor's performance of contract work on the Structure shall not be lessened or otherwise affected by Railroad's approval of the plans and specifications involving the Work, or by Railroad's collaboration in performance of any of the Work, or by the presence at the work site of a Railroad Representative, or by compliance by Licensee with any requests or recommendations made by the Railroad Representative.

ARTICLE 5 - TERM; TERMINATION

A. The grant of right herein made to Licensee shall commence on the date of this Agreement, and continue until acceptance of project by State, unless sooner terminated as herein provided, or at such time as Licensee has completed its Work on Railroad's property, whichever is earlier. Licensee agrees to notify the Railroad Representative in writing when it has completed its Work on Railroad's property.

B. Railroad may terminate this Agreement if it reasonably determines in good faith that Licensee has failed to comply with any of the material terms and conditions of this Agreement and has not cured such failure within ten (10) days after receiving notice (oral or written) from Railroad describing such failure in reasonable detail.

ARTICLE 6 - INSURANCE; CONTRACTOR'S ENDORSEMENT.

A. The State of California Department of Transportation ("State") is self-insured. State shall provide Railroad defense and indemnification at least equal to the defense, indemnification and insurance provisions (including the endorsements) contained in **Exhibit C**. Nothing herein shall be deemed to insure Railroad against its sole negligence or willful misconduct.

B. In the event any of the Work to be done upon the property of Railroad is to be done by a contractor or subcontractor of Licensee, said contractor or subcontractor may have the benefit of the license herein granted, while performing work for Licensee, provided such contractor or subcontractor agrees to be subject to and bound by the terms and conditions of this Agreement by: (1) executing an endorsement to this Agreement in the form set forth in Contractor's Endorsement marked **Exhibit E**, attached hereto, and (2) providing to Railroad the insurance policies, certificates, binders, and/or endorsements described in **Exhibit C** and (3) providing to Railroad the insurance endorsements required under Section 12 of **Exhibit B** of this Agreement.

C. All insurance correspondence, certificates, binders or originals shall be sent to:

Union Pacific Railroad Company
Senior Manager Contracts
1400 Douglas Street, MS 1690
Omaha, NE 68179-1690
UPRR Folder No. 2800-64

ARTICLE 7 - CHOICE OF FORUM

Unless otherwise preempted by applicable federal laws, rules or regulations, this Agreement shall be governed, construed and enforced in accordance with the laws of the State of California. Litigation arising out of or connected with this Agreement may be instituted and maintained in the courts of the State of California only, and the parties consent to jurisdiction over their person and over the subject matter of any such litigation, in those courts, and consent to service of process issued by such courts.

ARTICLE 8 - REMOVAL OF CONTRACTOR/SUBCONTRACTOR EMPLOYEE

At the request of Railroad, Licensee shall remove from Railroad property any contractor, subcontractor, officer, agent and/or employee of Licensee who fails to conform to the instructions of the Railroad Representative in connection with the Work on Railroad's property, and any right of Licensee shall be suspended until such removal has occurred. Licensee shall indemnify Railroad against any claims arising from the removal of any such contractor, subcontractor, officer, agent and/or employee from Railroad property.

ARTICLE 9 - ADMINISTRATIVE FEE

Upon the execution and delivery of this Agreement, Licensee shall pay to Railroad ONE THOUSAND DOLLARS (\$1000.00) as reimbursement for clerical, administrative and handling expenses in connection with the processing of this Agreement.

ARTICLE 10 -SPECIAL PROVISIONS

A. No additional vehicular crossings (including temporary haul roads) or pedestrian crossings over Railroad's trackage shall be installed or used by Licensee without the prior written permission of Railroad.

B. Explosives or other highly flammable substances shall not be stored on Railroad property without the prior written approval of the Railroad Representative.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in duplicate as of the date first herein written.

UNION PACIFIC RAILROAD COMPANY

By: _____

Title: _____

**STATE OF CALIFORNIA,
DEPARTMENT OF TRANSPORTATION**

By: _____

Title: _____

**EXHIBIT A
TO
CALTRANS RIGHT OF ENTRY AGREEMENT**

Exhibit A will be a print showing the general location of the right of entry area.

[PRINT TO BE PROVIDED BY UPRR]

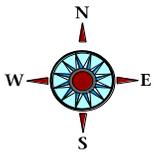


EXHIBIT "A"
RAILROAD LOCATION PRINT
ACCOMPANYING A
GRADE-SEPARATION AGREEMENT/CONTRACTOR'S
RIGHT OF ENTRY AGREEMENT



RR MP 293.83 (DOT 833702W),
Canyon Sub.

UNION PACIFIC RAILROAD COMPANY

CANYON SUBDIVISION
RAILROAD MILE POST 293.83
QUINCY, PLUMAS COUNTY, CA

To accompany an agreement with
**CALIFORNIA DEPT. OF TRANSPORTATION and its
CONTRACTORS**

UPRR Folder No. 2800-64 Date: May 23, 2016

WARNING

IN ALL OCCASIONS, U.P. COMMUNICATIONS DEPARTMENT MUST BE CONTACTED IN ADVANCE OF
ANY WORK TO DETERMINE EXISTENCE AND LOCATION OF FIBER OPTIC CABLE.

PHONE: 1-(800) 336-9193

**EXHIBIT B
TO
CALTRANS RIGHT OF ENTRY AGREEMENT**

Section 1. NOTICE OF COMMENCEMENT OF WORK - FLAGGING.

a. Licensee agrees to notify the Railroad Representative at least thirty (30) working days in advance of Licensee commencing its Work and at least ten (10) working days in advance of proposed performance of any Work by Licensee in which any person or equipment will be within twenty-five (25) feet of any track, or will be near enough to any track that any equipment extension (such as, but not limited to, a crane boom) will reach to within twenty-five (25) feet of any track. No Work of any kind shall be performed, and no person, equipment, machinery, tool(s), material(s), vehicle(s), or thing(s) shall be located, operated, placed, or stored within twenty-five (25) feet of any of Railroad's track(s) at any time, for any reason, unless and until a Railroad flagman is provided to watch for trains. Upon receipt of such 30-day notice, the Railroad Representative will determine and inform Licensee whether a flagman need be present and whether Licensee need implement any special protective or safety measures. If flagging or other special protective or safety measures are performed by Railroad, such services will be provided at Licensee's expense with the understanding that if Railroad provides any flagging or other services, Licensee shall not be relieved of any of its responsibilities or liabilities set forth herein. Licensee shall promptly pay to Railroad all charges connected with such services within 30 days after presentation of a bill therefore.

b. The rate of pay per hour for each flagman will be the prevailing hourly rate in effect for an eight hour day for the class of persons used during regularly assigned hours and overtime in accordance with Labor Agreements and Schedules in effect at the time the Work is performed. In addition to the cost of such labor, a composite charge for vacation, holiday, health & welfare, supplemental sickness, Railroad Retirement & UC, supplemental pension, Employee's Liability & Property Damage and Administration will be included, computed on actual payroll. The composite charge will be the prevailing composite charge in effect at the time the work is performed. One and one-half times the current hourly rate is paid for overtime, Saturdays and Sundays and two and one-half times current hourly rate for holidays. Wage rates are subject to change, at any time, by law or by agreement between Railroad and its employees, and may be retroactive as a result of negotiations or a ruling of an authorized governmental agency. Additional charges on labor are also subject to change. If the wage rate or additional charges are changed, Licensee shall pay on the basis of the new rates and charges.

c. Reimbursement to Railroad will be required covering the full eight hour day during which any flagman is furnished, unless the flagman can be assigned to other Railroad work during a portion of such day, in which event reimbursement will not be required for the portion of the day during which the flagman is engaged in other Railroad work. Reimbursement will also be required for any day not actually worked by the flagman following the flagman's assignment to work on the project for which Railroad is required to pay the flagman and which could not reasonably be avoided by Railroad by

assignment of such flagman to other work, even though the Licensee may not be working during such time. When it becomes necessary for Railroad to bulletin and assign an employee to a flagging position in compliance with union collective bargaining agreements, Licensee must provide Railroad a minimum of five (5) days' notice prior to the cessation of the need for a flagman. If five (5) days' notice of cessation is not given, Licensee will still be required to pay flagging charges for the five (5) day notice period required by union agreement to be given to the employee, even though flagging is not required for that period. An additional thirty (30) days' notice must then be given to Railroad if flagging services are needed again after such five (5) day cessation notice has been given to Railroad.

Section 2. LIMITATION AND SUBORDINATION OF RIGHTS GRANTED

a. The foregoing grant of right is subject and subordinate to the prior and continuing right and obligation of Railroad to use and maintain its entire property including the right and power of Railroad to construct, maintain, repair, renew, use, operate, change, modify or relocate railroad tracks, roadways, signal, communication, fiber optics, or other wire lines, pipelines and other facilities upon, along or across any or all parts of its property, all or any of which may be reasonably done at any time or times by Railroad without liability to Licensee or to any other party for compensation or damages.

b. The foregoing grant is also subject to all outstanding superior rights (including those in favor of licensees and lessees of Railroad's property, and others) and the right of Railroad to renew and extend the same, and is made without covenant of title or for quiet enjoyment.

Section 3. NO INTERFERENCE WITH OPERATION OF RAILROAD AND ITS TENANTS.

a. Licensee shall conduct its operations so as not to interfere with the continuous and uninterrupted use and operation of the railroad tracks and property of Railroad, including, without limitation, the operations of Railroad's lessees, licensees or others, unless specifically authorized in advance by the Railroad Representative. Nothing shall be done or permitted to be done by Licensee at any time that would in any manner impair the safety of such operations. When not in use, Licensee's machinery and materials shall be kept at least fifty (50) feet from the centerline of Railroad's nearest track, and there shall be no vehicular crossings of Railroad's tracks except at existing open public crossings.

b. Operations of Railroad and work performed by Railroad personnel and delays in the work to be performed by Licensee caused by such railroad operations and work are expected by Licensee, and Licensee agrees that Railroad shall have no liability to Licensee, or any other person or entity for any such delays. Licensee shall coordinate its activities with those of Railroad and third parties so as to avoid interference with railroad operations. The safe operation of Railroad train movements and other activities by Railroad takes precedence over any work to be performed by Licensee.

Section 4. LIENS.

Licensee shall pay in full all persons who perform labor or provide materials for the work to be performed by Licensee. Licensee shall not create, permit or suffer any mechanic's or materialmen's liens of any kind or nature to be created or enforced against any property of Railroad for any such work performed. Licensee shall indemnify and hold harmless Railroad from and against any and all liens, claims, demands, costs or expenses of whatsoever nature in any way connected with or growing out of such work done, labor performed, or materials furnished.

Section 5. PROTECTION OF FIBER OPTIC CABLE SYSTEMS.

a. Fiber optic cable systems may be buried on Railroad's property. Protection of the fiber optic cable systems is of extreme importance since any break could disrupt service to users resulting in business interruption and loss of revenue and profits. Licensee shall telephone Railroad during normal business hours (7:00 a.m. to 9:00 p.m. Central Time, Monday through Friday, except holidays) at 1-800-336-9193 (also a 24-hour, 7-day number for emergency calls) to determine if fiber optic cable is buried anywhere on Railroad's property to be used by Licensee. If it is, Licensee shall telephone the telecommunications company (ies) involved, arrange for a cable locator, make arrangements for relocation or other protection of the fiber optic cable, and shall commence no work on the right of way until all such protection or relocation has been accomplished.

b. In addition to other indemnity provisions in this Agreement, Licensee shall, pursuant to Cal. Gov. Code §14662.5, indemnify and hold Railroad harmless from and against all costs, liability and expense whatsoever (including, without limitation, attorneys' fees, court costs and expenses) arising out of any act or omission of Licensee and its employees that proximately causes or contributes to (1) any damage to or destruction of any telecommunications system on Railroad's property, and/or (2) any injury to or death of any person employed by or on behalf of any telecommunications company, and/or its contractors, agents and/or employees, on Railroad's property. Licensee shall not have or seek recourse against Railroad for any claim or cause of action for alleged loss of profits or revenue or loss of service or other consequential damage to a telecommunication company using Railroad's property or a customer or user of services of the fiber optic cable on Railroad's property.

Section 6. PERMITS - COMPLIANCE WITH LAWS.

In the prosecution of the work covered by this Agreement, Licensee shall secure any and all necessary permits and shall comply with all applicable federal, state and local laws, regulations and enactments affecting the work, including, without limitation, all applicable Federal Railroad Administration regulations.

Section 7. SAFETY.

a. Safety of personnel, property, rail operations and the public is of paramount importance in the prosecution of the work performed by Licensee. Licensee shall be responsible for initiating, maintaining and supervising all safety, operations and programs in connection with the work. Licensee shall at a minimum comply with Railroad's safety standards listed in **Exhibit D**, hereto attached, to ensure uniformity

with the safety standards followed by Railroad's own forces. As a part of Licensee's safety responsibilities, Licensee shall notify Railroad if Licensee determines that any of Railroad's safety standards are contrary to good safety practices. Licensee shall furnish copies of **Exhibit D** to each of its employees before they enter the job site.

b. Without limitation of the provisions of paragraph A above, Licensee shall keep the job site free from safety and health hazards and ensure that its employees are competent and adequately trained in all safety and health aspects of the job.

c. Licensee shall have proper first aid supplies available on the job site so that prompt first aid services may be provided to any person injured on the job site. Licensee shall promptly notify Railroad of any U.S. Occupational Safety and Health Administration reportable injuries. Licensee shall have a non-delegable duty to control its employees while they are on the job site or any other property of Railroad, and to be certain they do not use, be under the influence of, or have in their possession any alcoholic beverage, drug or other substance that may inhibit the safe performance of any work.

d. If and when requested by Railroad, Licensee shall deliver to Railroad a copy of Railroad's safety plan for conducting the work (the "Safety Plan"). Railroad shall have the right, but not the obligation, to require Licensee to correct any deficiencies in the Safety Plan. The terms of this Agreement shall control if there are any inconsistencies between this Agreement and the Safety Plan.

Section 8. INDEMNITY.

a. In accordance with Cal. Gov. Code §14662.5 and to the extent applicable, Licensee hereby agrees to indemnify and hold harmless Railroad, its affiliates, and its and their officers, agents and employees ("Indemnified Parties") from and against any and all loss, damage, injury, liability, claim, demand, cost or expense (including, without limitation, attorney's, consultant's and expert's fees, and court costs), fine or penalty (collectively, "Loss") incurred by any person (including, without limitation, any Indemnified Party, Licensee, or any employee of Licensee or of any Indemnified Party) arising out of or in any manner connected with (i) any Work performed by Licensee under this Agreement, or (ii) any act or omission of Licensee, its officers, agents or employees in connection with this Agreement, or (iii) any breach of this Agreement by Licensee.

b. To the extent permitted by Cal. Gov. Code §14662.5, the right to indemnity under this Section 8 shall accrue upon occurrence of the event giving rise to the Loss, and shall apply regardless of any negligence or strict liability of any Indemnified Party, except where the Loss is caused by the sole active negligence or willful misconduct of an Indemnified Party as established by the final judgment of a court of competent jurisdiction. The sole active negligence or willful misconduct of any Indemnified Party shall not bar the recovery of any other Indemnified Party.

c. Licensee expressly and specifically assumes potential liability under this Section 8 for claims or actions brought by Licensee's own employees. To the extent permitted by applicable law, Licensee waives any immunity it may have under worker's

compensation or industrial insurance acts to indemnify Railroad under this Section 8. Licensee acknowledges that this waiver was mutually negotiated by the parties hereto.

d. No court or jury findings in any employee's suit pursuant to any worker's compensation act or the Federal Employer's Liability Act against a party to this Agreement may be relied upon or used by Licensee in any attempt to assert liability against Railroad.

e. The provisions of this Section 8 shall survive the completion of any Work performed by Licensee or the termination or expiration of this Agreement. In no event shall this Section 8 or any other provision of this Agreement be deemed to limit any liability Licensee may have to any Indemnified Party by statute or under common law.

Section 9. RESTORATION OF PROPERTY.

In the event Railroad authorizes Licensee to take down any fence of Railroad or in any manner move or disturb any of the other property of Railroad in connection with the Work to be performed by Licensee, then in that event Licensee shall, as soon as possible and at Licensee's sole expense, restore such fence and other property to the same condition as the same were in before such fence was taken down or such other property was moved or disturbed. Licensee shall remove all of Licensee's tools, equipment and materials from Railroad's property promptly upon completion of the Work, restoring Railroad's property to the same state and condition as when Licensee entered thereon.

Section 10. WAIVER OF DEFAULT.

Waiver by Railroad of any breach or default of any condition, covenant or agreement herein contained to be kept, observed and performed by Licensee shall in no way impair the right of Railroad to avail itself of any remedy for any subsequent breach or default.

Section 11. MODIFICATION - ENTIRE AGREEMENT.

No modification of this Agreement shall be effective unless made in writing and signed by Licensee and Railroad. This Agreement and the exhibits attached hereto and made a part hereof constitute the entire understanding between Licensee and Railroad and cancel and supersede any prior negotiations, understandings or agreements, whether written or oral, with respect to the work to be performed by Licensee.

Section 12. ASSIGNMENT - SUBCONTRACTING.

Contractor shall not assign or subcontract this Agreement, or any interest therein, without the written consent of the Railroad. Contractor shall be responsible for the acts and omissions of all subcontractors. Before Contractor commences any work, the Contractor shall, except to the extent prohibited by law; (1) require each of its subcontractors to include the Contractor as "Additional Insured" in the subcontractor's Commercial General Liability policy and Business Automobile policies with respect to all liabilities arising out of the subcontractor's performance of work on behalf of the Contractor by endorsing these policies with ISO Additional Insured Endorsements CG

20 26, and CA 20 48 (or substitute forms providing equivalent coverage; (2) require each of its subcontractors to endorse their Commercial General Liability Policy with "Contractual Liability Railroads" ISO Form CG 24 17 10 01 (or a substitute form providing equivalent coverage) for the job site; and (3) require each of its subcontractors to endorse their Business Automobile Policy with "Coverage For Certain Operations In Connection With Railroads" ISO Form CA 20 70 10 01 (or a substitute form providing equivalent coverage) for the job site.

**EXHIBIT C
TO
CALTRANS RIGHT OF ENTRY AGREEMENT
INSURANCE PROVISIONS**

Contractor shall, at its sole cost and expense, procure and maintain during the course of the Project and until all Project work on Railroad's property has been completed and Contractor has removed all equipment and materials from Railroad's property and has cleaned and restored Railroad's property to Railroad's satisfaction, the following insurance coverage:

- A. Commercial General Liability Insurance.** Commercial general liability (CGL) with a limit of not less than \$5,000,000 each occurrence and an aggregate limit of not less than \$10,000,000. CGL insurance must be written on ISO occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage).

The policy must also contain the following endorsement, which must be stated on the certificate of insurance:

- Contractual Liability Railroads ISO form CG 24 17 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Railroad Company Property" as the Designated Job Site.

- B. Business Automobile Coverage Insurance.** Business auto coverage written on ISO form CA 00 01 (or a substitute form providing equivalent liability coverage) with a combined single limit of not less \$5,000,000 for each accident.

The policy must contain the following endorsements, which must be stated on the certificate of insurance:

- Coverage For Certain Operations In Connection With Railroads ISO form CA 20 70 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Property" as the Designated Job Site.
- Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90) if required by law.

- C. Workers' Compensation and Employers' Liability insurance.** Coverage must include but not be limited to:

- Contractor's statutory liability under the workers' compensation laws of the State of California.
- Employers' Liability (Part B) with limits of at least \$500,000 each accident, \$500,000 disease policy limit \$500,000 each employee.

If Contractor is self-insured, evidence of state approval and excess workers compensation coverage must be provided. Coverage must include liability arising out of the U. S. Longshoremen's and Harbor Workers' Act, the Jones Act, and the Outer Continental Shelf Land Act, if applicable.

Policy must contain the following endorsement, which must be stated on certificate of insurance:

- Alternate Employer endorsement ISO form WC 00 03 01 A (or a substitute form providing equivalent coverage) showing Railroad in the schedule as

the alternate employer (or a substitute form providing equivalent coverage).

- D. **Railroad Protective Liability Insurance.** Contractor must maintain Railroad Protective Liability insurance written on ISO occurrence form CG 00 35 12 04 (or a substitute form providing equivalent coverage) on behalf of Railroad as named insured, with a limit of not less than \$2,000,000 per occurrence and an aggregate of \$6,000,000. A binder stating the policy is in place must be submitted to Railroad before the work may be commenced and until the original policy is forwarded to Railroad.
- E. **Umbrella or Excess** insurance. If Contractor utilizes umbrella or excess policies, these policies must “follow form” and afford no less coverage than the primary policy.
- F. **Pollution Liability** insurance. Pollution liability coverage must be written on ISO form Pollution Liability Coverage Form Designated Sites CG 00 39 12 04 (or a substitute form providing equivalent liability coverage), with limits of at least \$5,000,000 per occurrence and an aggregate limit of \$10,000,000. If the scope of work as defined in this Agreement includes the disposal of any hazardous or non-hazardous materials from the job site, Contractor must furnish to Railroad evidence of pollution legal liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting the materials, with coverage in minimum amounts of \$1,000,000 per loss, and an annual aggregate of \$2,000,000.

Other Requirements

- G. All policy (ies) required above (except worker’s compensation and employers liability) must include Railroad as “Additional Insured” using ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage). The coverage provided to Railroad as additional insured shall, to the extent provided under ISO Additional Insured Endorsement CG 20 26, and CA 20 48 provide coverage for Railroad’s negligence whether sole or partial, active or passive, and shall not be limited by Contractor's liability under the indemnity provisions of this Agreement.
- H. Punitive damages exclusion, if any, must be deleted (and the deletion indicated on the certificate of insurance), unless the law governing this Agreement prohibits all punitive damages that might arise under this Agreement.
- I. Contractor waives all rights of recovery, and its insurers also waive all rights of subrogation of damages against Railroad and its agents, officers, directors and employees. This waiver must be stated on the certificate of insurance.
- J. Prior to commencing the work, Contractor shall furnish Railroad with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements in this Agreement.

- K.** All insurance policies must be written by a reputable insurance company acceptable to Railroad or with a current Best's Insurance Guide Rating of A- and Class VII or better, and authorized to do business in the State of California.
- L.** The fact that insurance is obtained by Contractor or by Railroad on behalf of Contractor will not be deemed to release or diminish the liability of Contractor, including, without limitation, liability under the indemnity provisions of this Agreement. Damages recoverable by Railroad from Contractor or any third party will not be limited by the amount of the required insurance coverage.

EXHIBIT D
TO
CALTRAN'S RIGHT OF ENTRY AGREEMENT

MINIMUM SAFETY REQUIREMENTS

The term "employees" as used herein refer to all employees of Licensee as well as all employees of any subcontractor or agent of Licensee.

I. Clothing

- A. All employees of Licensee will be suitably dressed to perform their duties safely and in a manner that will not interfere with their vision, hearing, or free use of their hands or feet.

Specifically, Licensee's employees must wear:

- (i) Waist-length shirts with sleeves.
- (ii) Trousers that cover the entire leg. If flare-legged trousers are worn, the trouser bottoms must be tied to prevent catching.
- (iii) Footwear that covers their ankles and has a defined heel. Employees working on bridges are required to wear safety-toed footwear that conforms to the American National Standards Institute (ANSI) and FRA footwear requirements.

- B. Employees shall not wear boots (other than work boots), sandals, canvas-type shoes, or other shoes that have thin soles or heels that are higher than normal.

- C. Employees must not wear loose or ragged clothing, neckties, finger rings, or other loose jewelry while operating or working on machinery.

II. Personal Protective Equipment

Licensee shall require its employees to wear personal protective equipment as specified by Railroad rules, regulations, or recommended or requested by the Railroad Representative.

- (i) Hard hat that meets the American National Standard (ANSI) Z89.1 – latest revision. Hard hats should be affixed with Licensee's company logo or name.
- (ii) Eye protection that meets American National Standard (ANSI) for occupational and educational eye and face protection, Z87.1 – latest revision. Additional eye protection must be provided to meet specific job situations such as welding, grinding, etc.
- (iii) Hearing protection, which affords enough attenuation to give protection from noise levels that will be occurring on the job site. Hearing protection, in the form of plugs or muffs, must be worn when employees are within:

- 100 feet of a locomotive or roadway/work equipment
 - 15 feet of power operated tools
 - 150 feet of jet blowers or pile drivers
 - 150 feet of retarders in use (when within 10 feet, employees must wear dual ear protection – plugs and muffs)
 -
- (iv) Other types of personal protective equipment, such as respirators, fall protection equipment, and face shields, must be worn as recommended or requested by the Railroad Representative.

III. On Track Safety

Licensee is responsible for compliance with the Federal Railroad Administration's Roadway Worker Protection regulations – 49CFR214, Subpart C and Railroad's On-Track Safety rules. Under 49CFR214, Subpart C, railroad contractors are responsible for the training of their employees on such regulations. In addition to the instructions contained in Roadway Worker Protection regulations, all employees must:

- (i) Maintain a distance of twenty-five (25) feet to any track unless the Railroad Representative is present to authorize movements.
- (ii) Wear orange reflectorized workwear approved by Railroad Representative.
- (iii) Participate in a job briefing that will specify the type of On-Track Safety for the type of work being performed. Licensee must take special note of limits of track authority, which tracks may or may not be fouled, and clearing the track. Licensee will also receive special instructions relating to the work zone around machines and minimum distances between machines while working or traveling.

IV. Equipment

A. It is the responsibility of Licensee to ensure that all equipment is in a safe condition to operate. If, in the opinion of the Railroad Representative, any of Licensee's equipment is unsafe for use, Licensee shall remove such equipment from the Railroad's property. In addition, Licensee must ensure that the operators of all equipment are properly trained and competent in the safe operation of the equipment. In addition, operators must be:

- Familiar and comply with Railroad's rules on lockout/tagout of equipment.
- Trained in and comply with the applicable operating rules if operating any hy-rail equipment on-track.
- Trained in and comply with the applicable air brake rules if operating any equipment that moves rail cars or any other railbound equipment.

- B. All self-propelled equipment must be equipped with a first-aid kit, fire extinguisher, and audible back-up warning device.
- C. Unless otherwise authorized by the Railroad Representative, all equipment must be parked a minimum of twenty-five (25) feet from any track. Before leaving any equipment unattended, the operator must stop the engine and properly secure the equipment against movement.
- D. Cranes must be equipped with three orange cones that will be used to mark the working area of the crane and the minimum clearances to overhead powerlines.

V. General Safety Requirements

- A. Licensee shall ensure that all waste is properly disposed of in accordance with applicable federal and state regulations.
- B. Licensee shall ensure that all employees participate in and comply with a job briefing conducted by the Railroad Representative, if applicable. During this briefing, the Railroad Representative will specify safe work procedures, (including On-Track Safety) and the potential hazards of the job. If any employee has any questions or concerns about the work, the employee must voice them during the job briefing. Additional job briefings will be conducted during the work as conditions, work procedures, or personnel change.
- C. All track work performed by Licensee meets the minimum safety requirements established by the Federal Railroad Administration's Track Safety Standards 49CFR213.
- D. All employees comply with the following safety procedures when working around any railroad track:
 - (i) Always be on the alert for moving equipment. Employees must always expect movement on any track, at any time, in either direction.
 - (ii) Do not step or walk on the top of the rail, frog, switches, guardrails, or other track components.
 - (iii) In passing around the ends of standing cars, engines, roadway machines or work equipment, leave at least 20 feet between yourself and the end of the equipment. Do not go between pieces of equipment if the opening is less than one car length (50 feet).
 - (iv) Avoid walking or standing on a track unless so authorized by the employee in charge.
 - (v) Before stepping over or crossing tracks, look in both directions first.
 - (vi) Do not sit on, lie under, or cross between cars except as required in the performance of your duties and only when track and equipment have been protected against movement.

- E. All employees must comply with all federal and state regulations concerning workplace safety.

EXHIBIT E
TO
CALTRANS RIGHT OF ENTRY AGREEMENT

CONTRACTOR'S ENDORSEMENT

A. As a condition to entering upon the Railroad's right-of-way to perform Work pursuant to this agreement, State's contractor, _____, (Name of Contractor)

whose address is _____ (Contractor's Mailing Address)

(hereinafter "Contractor"), agrees to comply with and be bound by all the terms and provisions of the attached Caltrans Right of Entry Agreement that was signed by Union Pacific Railroad Company ("Railroad") and the State of California, Department of Transportation ("State") relating to the Work to be performed and the insurance requirements set forth in Exhibit C of the Right of Entry Agreement. The Contractor further acknowledges and agrees that the reference to Cal. Gov. Code §14662.5 in Sections 5.b) and 8.b) of Exhibit B to the Right of Entry Agreement does not apply to the Contractor and in no way limits the indemnities set forth in those provisions, to which the Contractor agrees to be bound.

B. Before the Contractor commences any Work, the Contractor will provide the Railroad with (i) a binder of insurance for the Railroad Protective Liability Insurance described in Section 2 of the Contract Special Provisions, hereto attached, and the original policy, or a certified duplicate original policy when available, and (ii) a certificate issued by its insurance carrier providing the other insurance coverage and endorsements required pursuant to Section 2 of the Contract Special Provisions.

C. All insurance correspondence, binders or originals shall be directed to:

Union Pacific Railroad Company
Senior Manager Contracts
1400 Douglas Street, MS 1690
Omaha, NE 68179-1690
UPRR Folder No. 2800-64

D. Please note that fiber optic cable may be buried on the Railroad's property. **Prior to commencing any work, the Contractor agrees to contact the Railroad's Telecommunications Operation Center as provided in Section 5 of Exhibit B of the Right of Entry Agreement to determine if any fiber optic cable is located on the Railroad's property on or near the location where the work is to be performed.** If there is, the Contractor must comply with the terms and conditions of Section 5 of Exhibit B; before commencing any work on the Railroad's property.

E. **The Contractor agrees to also provide to the Railroad's Manager-Track Maintenance at (530) 235-0300, ext. 5080** the advance notice required in Section 1 of Exhibit A of the Right of Entry Agreement prior to working on the Railroad's property in

order for the Railroad to coordinate the Contractor's work with the Railroad's operations and to make arrangements for flagging protection (if applicable).

This endorsement shall be completed and sent to the person named in Paragraph C above.

(Name of Contractor)

By _____

Title: _____

Date: _____

For Contract No. 02-2C0904

MATERIALS INFORMATION

Foundation Report for Retaining Wall No.50 dated September 10, 2015

Memorandum

*Serious Drought.
Help Save Water!*

To: MR. JEFF SIMS
Branch Chief,
Bridge Design Branch 1
Office of Bridge Design North & Central
Structure Design
Division of Engineering Services MS9-4/81

Date: September 10, 2015

File: 02-PLU-70-PM 51.21

EA 02-2C0900
ID 0200000161
Str. No. 090006
Retaining Wall No.50

Attention: Mr. MANODE KODSUNTIE

From: **DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5**

Subject: Foundation Report (FR) for Retaining Wall No. 50 (Spring Garden OH Bridge)

Scope of Work

Per your request memo dated December 3, 2014, the Office of Geotechnical Design-North (OGD-N) has provided this Foundation Report (FR) for Retaining Wall No. 50 which is proposed to be constructed behind the existing Abutment 1 of Spring Garden OH Bridge (Br. No. 09-0062) located on SR 70 in Plumas County.

The Office of Bridge Design North & Central (OBD) Branch 1, proposes to construct a retaining wall to support the left edge of the approach fill at Abutment 1 of Spring Garden OH Bridge (Br No. 09-0062). The wall will consist of timber lagged soldier piles with no horizontal ground anchors.

This report is based on a review and evaluation of the "As-Built" records for the existing Spring Garden OH Bridge (Br. No. 09-0062), subsurface investigation performed from October, 2014 to April 2015, the request memo dated December 3, 2014, and on literature review of pertinent geological publications and related reports including the following:

1. Retaining Wall No. 50, General Plan dated 05/01/15.
2. Retaining Wall No. 50, Foundation Plans 1 & 2 dated 05/04/15.
3. Retaining Wall No. 50, Structure Plans 1 & 2 dated 05/01/15.
4. Spring Garden BOH (widen), General Plan, stamped 05/08/2015.

5. Final Hydraulic Report, Spring Garden Bridge and Overhead, (BOH), Br. No. 09-0062, located near Quincy, California, dated October 21, 2014.
6. Preliminary Foundation Report (PFR) for Spring Garden BOH, dated September 19, 2014.
7. Caltrans ARS Online (V2.3.06).
8. District Preliminary Geotechnical Report for Spring Garden OH, by Scott Lewis, dated July 28, 2009.
9. July 2009 Supplemental Project Scope Summary Report (Bridge Replacement) "To Request Programming in the 2008 SHOPP" (under the direction of Mark J. Miller, 9/3/2009).
10. BNSF Railway - Union Pacific Railroad: Guidelines for Railroad Grade Separation Projects, by A. Aman (File owner: UPRR, dated: 1/24/07).
11. Preliminary Geology Recommendations, dated March, 2002.
12. Addendum to PGR report for APS-Spring Garden Bridge and Overhead, dated March 28, 2002.
13. Preliminary Seismic Design Recommendations for Spring Garden OH, dated March 29, 2002.
14. Geologic Map of the Chico Quadrangle (1:250,000) compiled by G.J. Saucedo and D.L. Wagner, 1992.

Project Description

Per the December 3, 2014 request memo, OBD requested this FR in order to develop a Structure P&Q (Milestone 3/1/15) and Structure PS&E (milestone 1/1/16) for the widening, rehabilitation and seismic retrofit of Spring Garden BOH (Br. No. 09-0062). The proposed soldier pile wall is part of an overall road improvement effort within the project limits.

The proposed soldier pile and timber lagging retaining wall (Retaining Wall No. 50) will be located behind Abutment 1 of the existing Spring Garden Bridge located on SR 70, about six miles east of the City of Quincy. The wall will be approximately 261 feet long, with a maximum design height of 15 feet and will consist of steel-H soldier piles installed in 30-inch diameter drilled holes that will be filled with concrete. The H-piles will be installed in rock at the cut slope adjacent to the existing masonry concrete retaining wall located directly behind Abutment 1. The existing concrete retaining wall will remain in place so the roadway can stay open during construction (OBD request memo, 2014).

The LOL on the GP dated 05/01/15, indicates the footprints of proposed wall to be located from 22.75' left Station 48 + 95.78, to 22.75' Left Station 51 + 56.95 "X" Line.

The Pile spacing will be 10 feet between piles from pile No. 1 to Pile No. 9; and 7.5 feet from pile No. 9 to pile No. 33.

The following datum was used on the Foundation Plan dated 05/04/15 to reference horizontal and vertical positions of the proposed structure:

Horizontal: North American Datum of 1983 NAD83 (1991.35)

Vertical: National Geodetic Vertical Datum of 1929 (GVD29)

The location and geometric layout data for the proposed soldier pile and lagging wall is indicated on the General Plan and on the Structure Plans 1 & 2 dated 05/01/2015. Table 1 below is a summary of the wall information.

Table 1: Summary of Soldier Pile Wall Information

Wall Section	Top of Wall Elevation (ft)	RW LOL Station (ft)		Wall Type	Number of Lagging Members (ft)
		From	To		
Pile No.				Steel H- Soldier Pile with Timber Lagging	
NA	NA	48 + 95.78	51+ 56.93	NA	NA
1 to 3	3865.51 to 3866.09	9 +99.40	10 + 20.00	W14 x 68	2
3 to 4	3866.09 to 3866.46	10 + 20.00	10 + 30.00	W14 x 68	3
4 to 5	3866.46 to 3866.83	10 + 30.00	10 + 40.00	W14 x 68	4
5 to 6	3866.83 to 3867.20	10 + 40.00	10 + 50.00	W14 x 68	5
6 to 7	3867.20 to 3867.55	10 + 50.00	10 + 60.00	W14 x 68	7
7 to 8	3867.55 to 3867.90	10 + 60.00	10 + 70.00	W14 x 68	9
8 to 9	3867.90 to 3868.25	10 + 70.00	10 + 80.00	W14 x 68	10
9 to 10	3868.25 to 3868.50	10 + 80.00	10 + 87.50	W14 x 68	11
10 to 11	3868.50 to 3868.75	10 + 87.50	10 + 95.00	W14 x 68	12
11 to 17	3868.75 to 3870.18	10 + 95.00	11 + 40.18	W14 x 99	13
17 to 24	3870.18 to 3871.57	11 + 40.00	11 + 92.50	W14 x 99	14
24 to 25	3871.57 to 3871.72	11 + 92.50	12 + 00.0	W14 x 99	13
25 to 26	3871.72 to 3871.87	12 + 00.00	12 + 07.50	W14 x 68	12
26 to 27	3871.87 to 3872.01	12 + 07.50	12 +15.00	W14 x 68	11
27 to 28	3872.01 to 3872.14	12 +15.00	12 +22.50	W14 x 68	10
28 to 29	3872.14 to 3872.28	12 +22.50	12 +30.00	W14 x 68	9
29 to 30	3872.28 to 3872.41	12 +30.00	12 +37.50	W14 x 68	8
30 to 31	3872.41 to 3872.54	12 +37.50	12 +45.00	W14 x 68	7
31 to 32	3872.54 to 3872.67	12 +45.00	12 +52.50	W14 x 68	8

Table 2: Foundation Data for Retaining Wall No. 50 (Str. No. 09E0006)

Pile No.	Pile Type	Pile Tip Elevation (ft)	Pile No.	Pile Type	Pile Tip Elevation (ft)
	Steel H-Pile Grouted in 30-inch Diameter Drilled Hole			Steel H-Pile Grouted in 30-inch Diameter Drilled Hole	
1	W14 X 68	3857.40	19	W14 X 99	3844.70
2	W14 X 68	3857.40	20	W14 X 99	3844.80
3	W14 X 68	3856.80	21	W14 X 99	3845.00
4	W14 X 68	3856.00	22	W14 X 99	3845.10
5	W14 X 68	3855.20	23	W14 X 99	3845.40
6	W14 X 68	3853.20	24	W14 X 99	3845.80
7	W14 X 68	3849.90	35	W14 X 99	3848.20
8	W14 X 68	3848.20	26	W14 X 68	3849.60
9	W14 X 68	3847.30	27	W14 X 68	3849.50
10	W14 X 68	3846.60	28	W14 X 68	3851.00
11	W14 X 99	3848.30	29	W14 X 68	3850.80
12	W14 X 99	3846.40	30	W14 X 68	3850.60
13	W14 X 99	3845.40	31	W14 X 68	3850.50
14	W14 X 99	3845.50	32	W14 X 68	3848.90
15	W14 X 99	3845.70	NA	NA	NA
16	W14 X 99	3845.90	NA	NA	NA
17	W14 X 99	3844.70	NA	NA	NA
18	W14 X 99	3844.50	NA	NA	NA

Field Investigation and Testing Program

The Office of Geotechnical Design-North conducted a subsurface investigation in October, 2014 and in April, 2015 for the proposed retrofit and rehabilitation of Spring Garden (Br. No. 09-0062), and for the proposed Retaining Wall No. 50 (Str. No. 09E0060). The purpose of the investigation was to determine the site-specific geology for the foundation recommendations for the proposed retaining wall.

Four mud rotary soil/rock borings were completed in October, 2014 and April 2015. The mud rotary borings were advanced using a self-casing wireline drilling method with a diamond bit for rock coring. The maximum depth achieved was 76.5 feet into soil and rock (Borings RC-15-004). Standard Penetration Test (SPT) sampling was performed in soil and rock layers where possible. Soil and rock core samples were collected and labeled in core boxes for selective rock sample analysis and storage. A summary of the borings drilled during the subsurface investigation is included below in Table 1.

Table 3. Summary of subsurface investigation for Retaining Wall No. 50 (Str. No. 9E0006)

Boring No.	Approx. Location	Date Completed	Drill Rig/ID	Hammer Type	Hammer Efficiency (%)	Surface Elevation of Boring (ft)	Boring Depth (ft)	Approx. Bedrock surface Elevation (ft)
RC-14-001	280 ft. behind Abut 1	10/20/14	Acker (0398)	Automatic	71 4/26/13	3866.35 (on roadway)	43	3864
RC-14-002	220 ft. behind Abut 1	10/22/14	Acker	Automatic	71 4/26/13	3867.97 (on roadway)	55	3863
RC-14-003	150 ft. behind Abut 1	10/21/14	Acker (0398)	Automatic	71 4/26/13	3868.89 (on roadway)	60	3863
RC-15-004	18 ft behind Abut 1	10/13/14	Acker (0398)	Automatic	71 4/26/13	3871.85	76	3862

The subsurface geologic data will be provided on the Project Log of Test Borings (LOTB) when completed.

The conclusions and recommendations in this report are based on available project records (As-Built Plans, geotechnical reports and geologic literature), as indicated on page 2 under Scope of Work, and on the October, 2014 and the April 2015 subsurface investigation.

Laboratory Testing Program

Selected rock/soil samples were submitted to the soils laboratory for analyses. The samples were analyzed for corrosion and unconfined compressive strength (qu). Corrosion results are provided under the corrosion section below. The qu results are shown in Table 4 below.

Table 4: Results of Laboratory Analysis of Rock Samples at Ret Wall No. 50 Location

Sample No.	Location	Sample depth (ft)	Sample Type	Unconfined Compressive Strength (qu) (psi)
RC-14-002-6A	Boring RC-14-002	29.2 to 30	Rock (Serpentinite)	14738
RC-15-004-7A	Boring RC-15-004	32 to 33	Rock (Serpentinite)	5004

A report of the detailed results is provided as part of the attachments to this report.

Site Geology and Subsurface Conditions

The project site is located within the northern part of the Sierra Nevada geomorphic province of California (Norris and Webb 2nd Edition). The Geologic Map of the Chico Quadrangle (Compiled by G.J. Saucedo and D.L. Wagner, 1992) indicates that the site is underlain by serpentinized ultramafic rocks (um) within the Shoo Fly Complex.

According to Saucedo and Wagner 1992, the Shoo Fly Complex (Pzsf) consists of a mixture of meta-sedimentary, mafic, and ultramafic rocks, including serpentinized ultramafic rocks. The Shoo Fly Complex is mapped as lower Paleozoic (mainly Ordovician-Silurian) in age (Saucedo and Wagner, Geologic Map of the Chico Quadrangle, 1992).

A subsurface foundation investigation was conducted for the existing Spring Garden OH Bridge (Br. No. 09-0062) in July, 1953. However, no borings were located within the footprint of the proposed retaining wall (No. 50) behind Abutment 1 of Spring Garden OH Bridge.

The recent field investigation conducted in October, 2014 and April, 2015, explored to a maximum depth of approximately 76 feet (approximately equivalent to elevation 3796 feet) in Boring RC-15-004. Borings RC-14-001, 002 and 003 were also drilled within the footprint of the proposed soldier pile wall.

A temporary piezometer was installed in Borings RC-14-010 for the groundwater measurement at the bridge site. Groundwater elevation for the proposed retaining wall is based on groundwater measurement obtained for Spring Garden OH Bridge.

The subsurface soil/rock encountered during the recent subsurface investigation conducted in October 14, 2014, and April, 2015, consists of granular materials comprised of sandy/silty gravel and cobbles overlying mainly serpentinite bedrock.

The soil/rock layers encountered can be generalized as follows:

- Upper layer of mainly fill material comprised of medium to dense silty and sandy gravel and cobbles which ranges in thickness from approximately two feet (Boring RC 14-001) to 10 feet (Boring RC-15-004) in thickness.
- A bedrock comprised of dark greenish gray, gray, and black serpentinite, which exhibits varying degrees of weathering, fracturing, and hardness. The serpentinite encountered in the borings drilled in for this project was intensely weathered and decomposed in places, to moderately weathered and fresh rock. It ranges in hardness from soft for weathered rock, to moderately hard and very hard for fresh rock. The serpentinite was weathered into a soft, gray and white fibrous mass in places. The serpentinite was moderately to intensely fractured, and occasionally exhibited two predominant sets of joint/fractures that intersect along the core axis (approximately a northwest-southeast set intersecting a northeast-southwest set). The fracture surfaces were generally serpentinitized and slickensided, but occasionally, the surfaces are filled or lined with clay, or secondary minerals like calcite, and probably talc or magnesite. Some fractures were filled/healed by one or the other secondary minerals mentioned above. In places, distinctly light gray to light green blocks of various sizes comprised of relatively fresh and very hard massive, and granular rock, occurred within the distinct serpentinite bedrock. The parting surfaces of the blocks of rock may or may not be serpentinitized. The massive felsic rocks may represent meta-sedimentary units within the Shoo Fly Complex that underlies the area.

The boring data for this project will be provided on the Log of Test Borings, LOTBs, which will be forwarded when completed.

Groundwater

Based on the As- Built LOTB, groundwater was encountered on July 1, 1953, at elevation 3803 ft (approximately at creek level).

Table 5 below indicates recorded groundwater measurements during October of 2014.

Table 5: Groundwater measurement in Boring RC-14-010 (Br. No. 09-0062)

Boring	Date	Estimated top of boring elevation (ft)	Measured groundwater elevation (ft)	Depth to groundwater (ft)
RC-14-010	10/09/14	3848	3807	41
RC-14-010	10/13/14	3848	3804	44
RC-14-010	10/20/14	3848	3803	45

Note: Boring RC-14-010 is located under the existing bridge on the old SR 402A at approximately elevation 3848 ft.

The average measured groundwater elevation during the October, 2014, investigation is approximately 3804.7 ft. Based on this groundwater information at the Spring Garden bridge location, groundwater elevation at the location of this proposed retaining wall (Ret Wall 50) is assumed to be at 3804.7 ft. It is important to note that perched water may be present, trapped within, the serpentinite bedrock, and should be expected to be encountered at elevations above the groundwater elevation during construction.

Scour Evaluation

Surface water in the vicinity of the project will be limited to local storm water run-off, which must be controlled in shallow ditches or channels and directed away from foundation elements and embankment fills. Scour will not affect the structure foundations because there is no watercourse under, or adjacent to the proposed new retaining wall.

Corrosion Evaluation

Soil/rock samples were obtained for corrosion analyses at the locations shown in the table below. Table 6 shows laboratory results for soil/rock samples collected and analyzed during the foundation investigations conducted in October, 2014 and April, 2015.

Table 6: Corrosion Test Summary Report-Ret Wall 50 (Str. No. 09E0006)

SIC Number (TL101)	Sample Location (Boring Number)	Sample Type	Sample Depth (ft)	Minimum Resistivity ¹ (ohm-cm)	pH ¹	Chloride Content ² (ppm)	Sulfate Content ³ (ppm)	Is sample Corrosive?
C874578	R-14-002	Soil/rock	5-15	2473	8.01	-	-	No
C874576	R-15-004	Soil/rock	0-5	2083	8.06	154	35	No
C874577	R-15-004	Soil/rock	10-15	466	6.0	703	12	Yes

Note: For Structural Elements, Caltrans considers a site corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at the site:

pH is 5.5 or less, chloride concentration is 500 ppm or greater, sulfate concentration is 2000 ppm or greater. Resistivity is not considered for structural elements. MSE backfill shall conform to the requirements of section 47-2.0C Structure Backfill in the 2010 Standard Specifications.

The minimum resistivity serves only as an indicator parameter for the possible presence of soluble salts and is not used to define a site as being corrosive. It is the practice of the Corrosion Technology Branch that if the minimum Resistivity of the sample is greater than 1000 ohm-cm, the sample is considered to be non-corrosive and testing to determine the sulfate and chloride content is not performed.

Based on these corrosion results, the native soil/rock beneath the proposed new Retaining Wall 50 (Str. No. 09E0006) at Spring Garden OH Bridge site is corrosive to foundation elements per Caltrans standards (Soil/rock Sample No. RC-15-004, from 10 to 15 ft depth).

Per *Bridge Memo to Designers 3-1*, Caltrans typically includes a corrosion allowance (sacrificial metal loss) for steel pile foundations. Sacrificial metal or corrosion allowance is the thickness of metal (above what is structurally required for the pile) needed to compensate for the loss of metal that will occur as the pile corrodes. This extra metal thickness is added to all surfaces of the pile exposed to the corrosive soil or water.

The Department currently uses the following corrosion rates for steel piling exposed to corrosive soil and/or water.

Soil Embedded Zone	0.025 mm (0.001 in) per year
Immersed Zone	0.100 mm (0.004 in) per year
Scour Zone	0.125 mm (0.005 in) per year

It is recommended that the Steel piles and concrete used for foundation elements for the proposed Soldier Pile Wall No. 50 at Spring Garden OH be treated for corrosion protection per Bridge Memo to Designers 3-1 and Corrosion protection for reinforced concrete in accordance with Section 5 *Concrete Structures of California Amendments (to the AASHTO LRFD Bridge Design Specifications - Fourth Edition)*.

Seismic Recommendations

Based on the As-Built LOTBs, a V_{S30} (the weighted average shear wave velocity for the top 100 feet of foundation materials) of about 2,000 feet per second is considered applicable for the site.

Based on the "Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations, November 2012," the design ground motion is the highest spectral acceleration as obtained by any or a combination of the following three methods for the bridge site:

- 1) Statewide minimum deterministic spectrum with MMax of 6.5, vertical strike-slip event with a rupture distance of 7.5 miles.
- 2) Deterministic Spectrum from the ARS Online Tool (Version 2.3.06).
- 3) The USGS 5% Probability of Exceedance in 50 years (975 years return period).

The design Acceleration Response Spectrum (ARS) is determined by method 3 as stated above. The peak ground acceleration is estimated to be 0.30 g. The potential for soil liquefaction is insignificant because there is no loose saturated granular soil at the site.

There are no known faults that are Holocene or younger in age that fall within 1,000 feet of the structure. The structure does not fall within an Alquist-Priolo Earthquake Fault Zone. According to the Caltrans Memo To Designers 20-10 of January 2013, there is no need for a fault rupture hazard study.

Foundation Recommendations

The following soils/rock parameters may be used for the design of the Soldier Pile Wall No. 50, which is proposed to be constructed to retain the approach fill behind Abutment 1 of Spring Garden OH Bridge (Br. No. 09-0062):

Wall Type: Soldier Pile and Timber Lagging System (Steel H W14 x 90 and W14 x 120).
(22.75' Lt. Sta. 48+95.78 to 22.75' Lt. Station 51+ 56.93 "X" Line; 15 ft high.)

Active pressure of fill: 43 psf/ft of equivalent fluid pressure ($k_a = 0.31$).
Seismic active pressure increment: 8 psf/ft. ($k_h = 0.1$)
Surcharge loads need to be added.

The soldier piles can be designed using the following parameters:

Fills:

Unit weight (γ): 140 pcf; friction angle (ϕ): 32 degrees, $c = 0$;

Fractured and weathered bedrock:

Unit weight (γ): 150 pcf; $c = 2000$ psf; frictional angle (ϕ) = 0

Table 3 above indicates the bedrock surface elevations in the borings drilled for this project.

The slopes are considered globally stable under static and seismic condition.

General Note to Designer

1. It is recommended that the soldier pile wall be well drained to prevent buildup of hydrostatic pressure behind the wall.
2. The backfill materials used shall be approved by the Engineer.
3. The Office of Geotechnical Engineering shall be invited to the pre-construction meeting.
4. The Engineer shall review the corrosion protection requirements of soldier piles and confirm that the Contractor follows the requirements set out in the Plans.

Construction Considerations

1. Groundwater was measured at approximately elevation 3804 feet during the subsurface investigations in October 2014 and April 2015 for the proposed soldier pile wall and bridge retrofit/widening. This is approximately a depth of 64 feet below the average ground surface elevation along the foot prints of the proposed soldier pile wall. Groundwater is therefore approximately 30 feet below the lowest pile tip elevation for the soldier piles. However, during construction of the H-pile shafts, the Contractor should anticipate water in the shafts resulting from seepage of storm water, or from perched water trapped within the fractured bedrock. Pumping of water to keep the shaft dry should therefore be expected during construction and installation of the H-piles in the shafts.

2. Fill material comprised of sand, silt, cobbles and possible boulders overlies hard and very hard bedrock at the site. It is therefore advisable for the Contractor to anticipate hard drilling through large and hard boulders and bedrock, and be prepared with the appropriate drilling tools and equipment for coring through hard rock in places.

3. The tools and equipment that are planned for use by the Contractor shall be described in the Contractor's drilled shaft construction plan, and the tools and equipment actually used during construction be documented by the Engineer in the construction records.

4. The bedrock generally ranges in hardness from soft to very hard, but is mostly fractured. The Contractor should therefore be prepared for vertical and horizontal variations in hardness when coring the bedrock.

5. The Engineer shall inspect the integrity of the soldier pile hole/shafts before they are filled with concrete backfill.

6. The Engineer shall confirm that the embedment depth of the soldier piles is consistent with the Plans and that the soldier piles are properly aligned before concrete placement and remains aligned during concrete placement.

7. The Engineer shall confirm that lagging is placed at an appropriate time after excavation to ensure no soil failure occurs and the lagging is placed from top-down in sufficiently small lifts based on the Specifications, and that a gap is left between vertically adjacent lagging boards.

8. The occurrence of serpentinite at the site may indicate the presence of asbestos. We recommend that the North Region Hazardous Waste Coordinator be contacted for additional recommendations.

9. The Office of Geotechnical Design-North should be invited to a pre-construction meeting.

The recommendations contained in this memorandum are based on specific project information regarding structure type, and locations that have been provided by OSB. If any conceptual changes to the structure are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the foundation recommendations herein provided are still applicable.

If you have any questions or need further information regarding this report, please contact Abu Barrie at (916) 227-1043, Reid Buell (916) 227-1012, John Huang (916) 227-1037.

Report by:

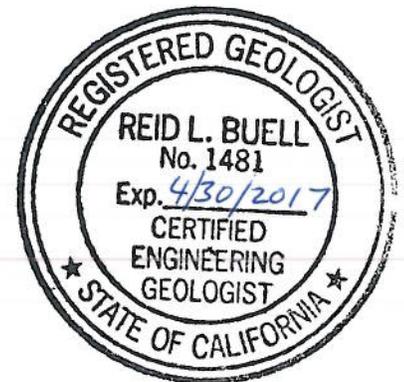


ABUBAKARR BARRIE
Engineering Geologist
Office of Geotechnical Design-North



REID BUELL, C.E.G. 1481
Senior Engineering Geologist
Office of Geotechnical Design-North

John Huang, P.E.
Senior Materials and Research Engineer
Office of Geotechnical Design-North



Attachment: (1) ARS curve
(2) Layout Plans
(3) Lab Results

cc: Eric Orr, District Project Manager (e-copy)
Eskinder Taddese, Project Liaison Engineer (e-copy)
Chris Quiney District Environmental Planner (e-copy)
District Materials Engineer –
GS Corporate

Spring Garden BOH

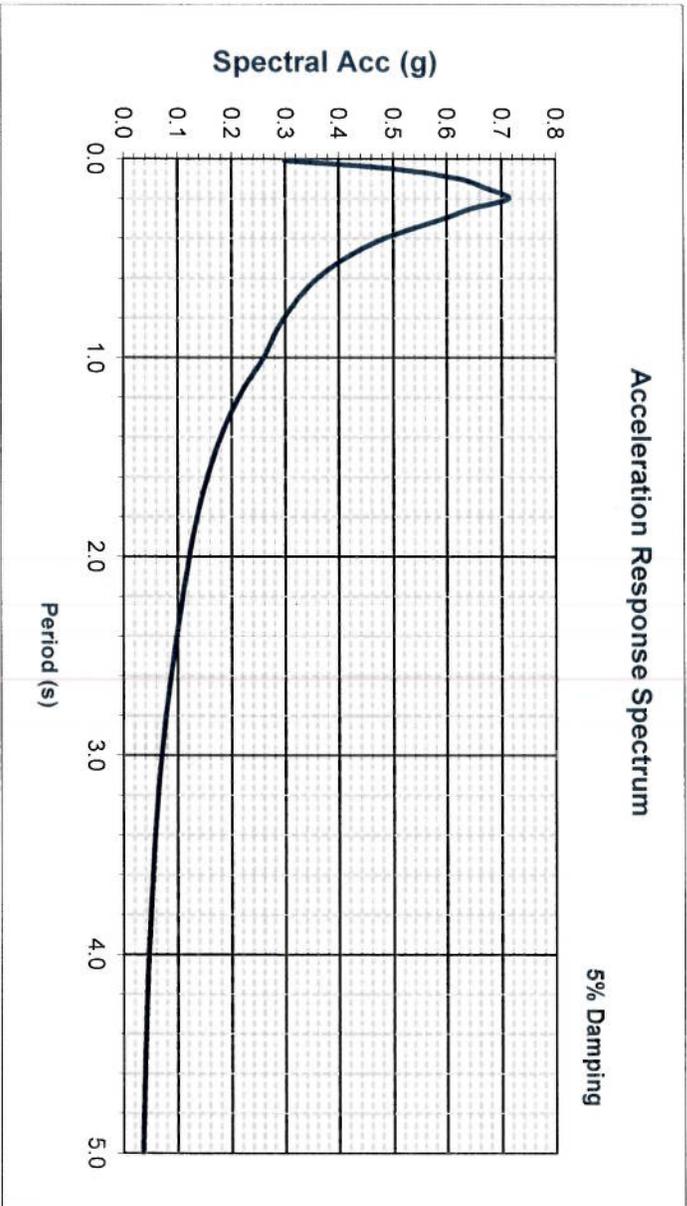
Bridge No. 09-0062

EFIS 0200000161

Latitude 39.911711
Longitude -120.81270

Control Probabilistic

Period (s)	Sa(g)
0.010	0.299
0.050	0.498
0.100	0.621
0.150	0.673
0.200	0.713
0.250	0.645
0.300	0.595
0.400	0.484
0.500	0.412
0.600	0.361
0.700	0.325
0.850	0.286
1.000	0.259
1.200	0.213
1.500	0.167
2.000	0.122
3.000	0.070
4.000	0.046
5.000	0.035



Deterministic Procedure Data

Fault	Butt Creek fault zone
Fault ID	48
Style	SS
Mmax	7
Dip	90 deg
ZBOR	8 mi
ZTOR	0 mi

Notes
Please note the Design ARS curve is based on the USGS 5% Probability of Exceedance in 50 years (975 years return period).

R_{rup}	13.0	mi
R_{1b}	13.0	mi
R_x	5.0	mi
V_{s30}	2000	ft/s
$Z_{1.0}$	N/A	ft
$Z_{2.5}$	N/A	mi

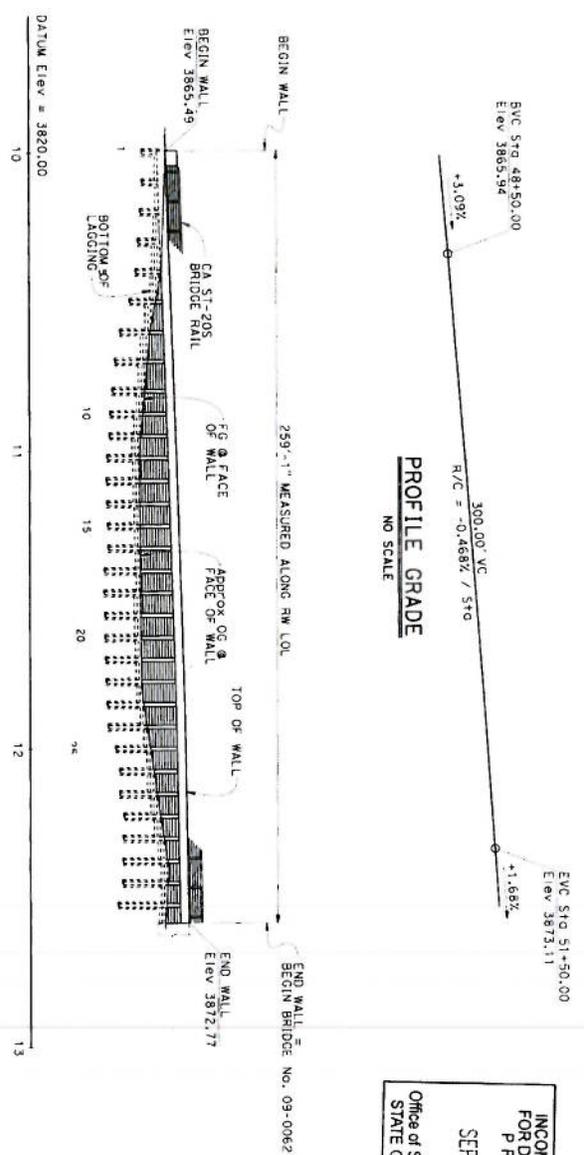
Final

Design Response Spectrum

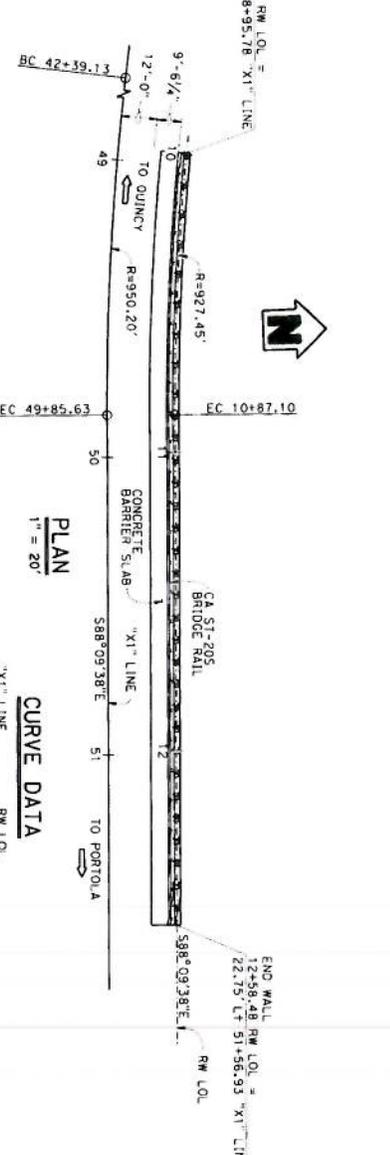
PROFILE GRADE
NO SCALE

INCOMPLETE PLAN
FOR DESIGN STUDY
PRINTED
SEP 11 2015
Office of Structures, Design
STATE OF CALIFORNIA

POST COUNTY	ROUTE	POST MILEAGE TOTAL PROJECT	SHEET NO. OF SHEETS
02	70		1
REGISTERED CIVIL ENGINEER		DATE	
REGISTERED CIVIL ENGINEER		DATE	
REGISTERED CIVIL ENGINEER No. 5521 State of California CIVIL			



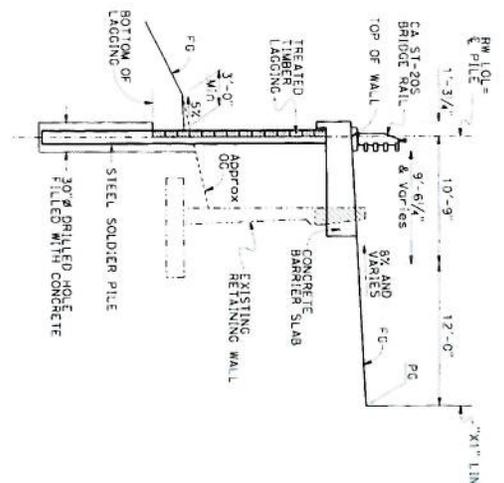
MIRRORED ELEVATION
1" = 20'



CURVE DATA
1" = 20'

R = 950.20'	R = 927.45'
Δ = 45°00.47"	Δ = 5°25.04"
T = 393.71'	T = 43.88'
L = 746.50'	L = 87.70'

TYPICAL SECTION
1" = 5'



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

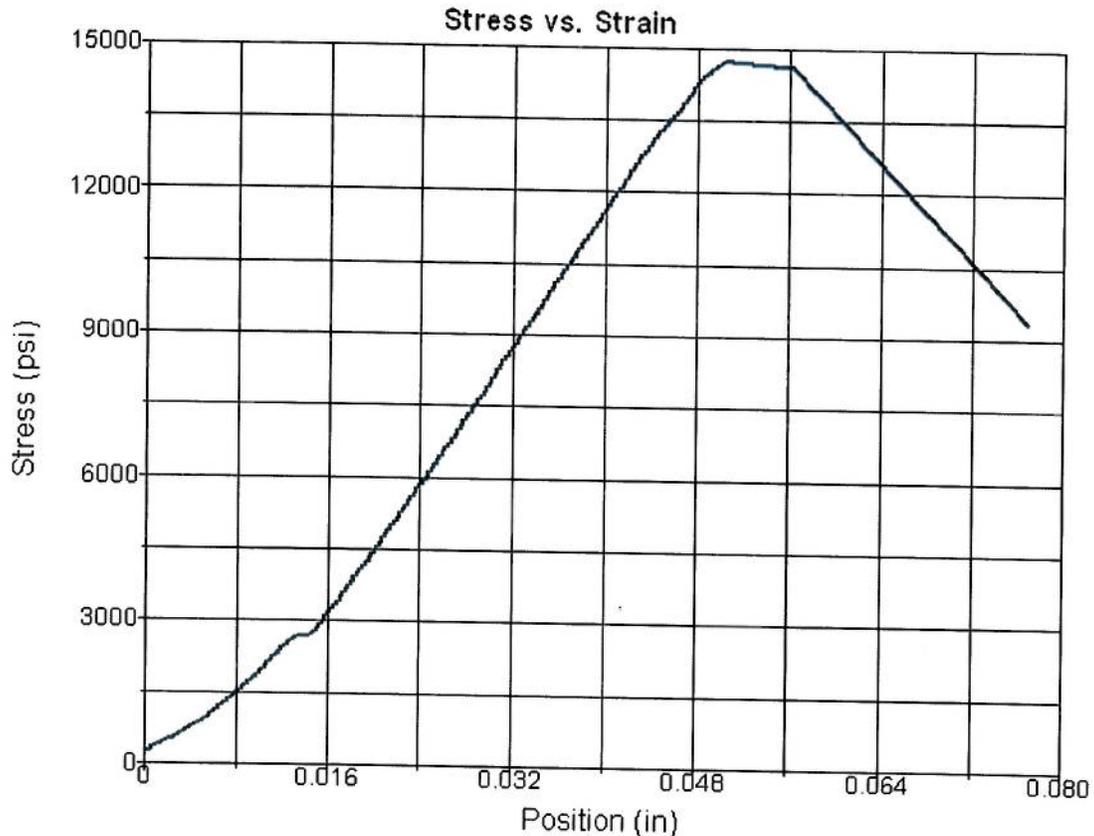
DIVISION OF STRUCTURAL SERVICES
DESIGN BRANCH 1

RETAINING WALL NO. 50
GENERAL PLAN

DESIGN ENGINEER	DATE	PROJECT NO.	CONTRACT NO.
Jeff Sims		0200009611	02-200904
DESIGNER	DATE	PROJECT NO.	CONTRACT NO.
Worold Koshlinski		0200009611	02-200904
CHECKER	DATE	PROJECT NO.	CONTRACT NO.
Keith Stillman		0200009611	02-200904
APPROVER	DATE	PROJECT NO.	CONTRACT NO.
Worold Koshlinski		0200009611	02-200904

CHECKED DESIGN

NOTE: "INDEX TO PLANS", "GENERAL NOTES", and "QUANTITIES", see "INDEX TO PLANS" sheet.

**Test Summary**

Sample: RC-14-002-6A
 Depth: 29.2
 Description: Light greenish gray metamorphic rock, fine to medium grained and massive w/near vertical felsic veins(core-axis).

Dist-EA: 02-2C0900
 Location: 02-PLU-70-50.3-50
 Project: SPRING GARDEN OH BRIDGE
 GL #: 15-029
 Ticket: Q15-037

Procedure Name: ASTM D7012 Method C
 Start Date: 5/29/2015
 Elapsed Time: 00:06:51
 Workstation: DIK00YB1
 Operator: AZM

Moisture Condition: As-Received, Not Tested

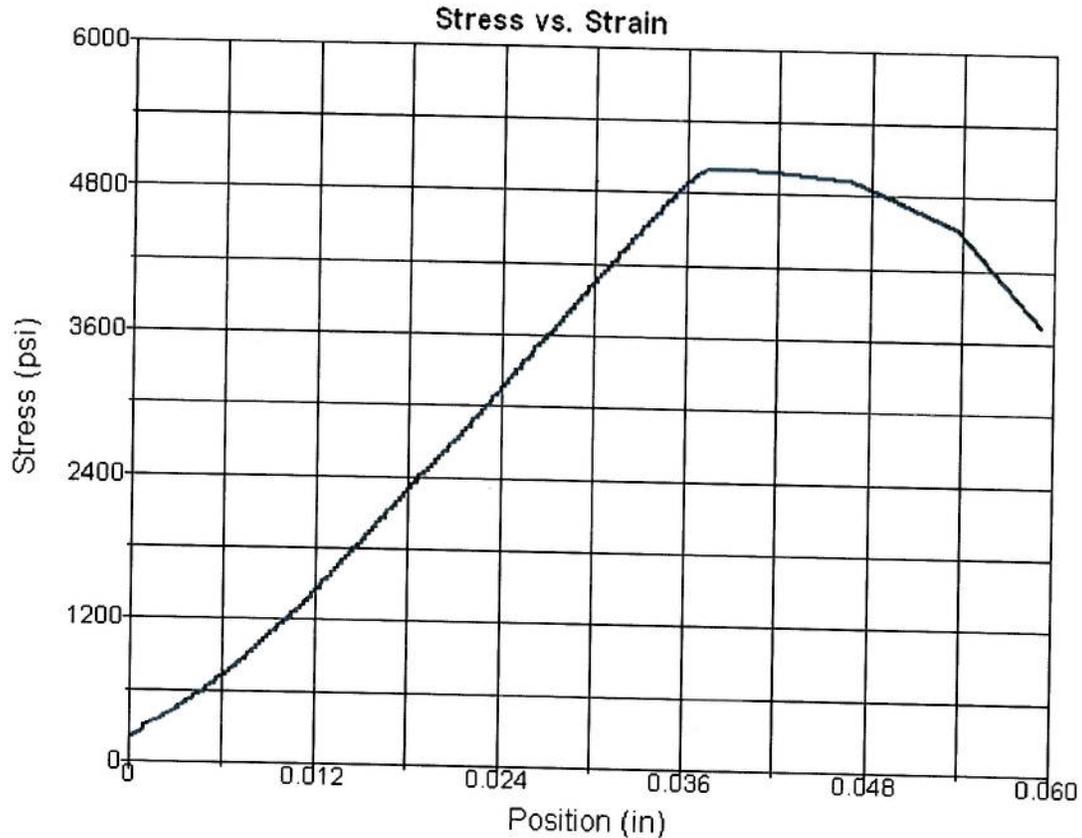
Non-Conformances: Flatness

Comments: Best Effort Conform.; Test As-Is

Test Results

Specimen Gage Length: 5.5200 in
 Diameter: 2.3890 in
 Area: 4.4825 in²
 Maximum Load: 66061 lbf
 Compressive Strength: 14738 psi
 Peak Load Rate: 1.52e+005 lbf/min



**Test Summary**

Sample: RC-15-004-7A
 Depth: 32
 Description: Dark greenish gray - black serpentinite. Foliated and intensely fractured; fractures infilled by secondary minerals.

Dist-EA: 02-2C0900
 Location: 02-PLU-70-50.3-50
 Project: Spring Garden OH Bridge
 GL #: 15-029
 Ticket: Q15-038
 Procedure Name: ASTM D7012 Method C
 Start Date: 6/3/2015
 Elapsed Time: 00:02:15
 Workstation: D1K00YB1
 Operator: AZM
 Moisture Condition: As-Received, Not Tested
 Non-Conformances: Flatness
 Comments: Best Effort Conform.; Test As-Is

Test Results

Specimen Gage Length: 5.2700 in
 Diameter: 2.3890 in
 Area: 4.4825 in²
 Maximum Load: 22430 lbf
 Compressive Strength: 5004 psi
 Peak Load Rate: 1.03e+005 lbf/min



For Contract No. 02-2C0904

MATERIALS INFORMATION

Foundation Report for Spring Garden BOH (Bridge No. 09-0062) dated September 30, 2015

Memorandum

*Serious Drought.
Help Save Water!*

To: MR. JEFF SIMS
Branch Chief,
Bridge Design Branch 1
Office of Bridge Design North & Central
Structure Design
Division of Engineering Services MS9-4/81

Date: September 30, 2015

File: 02-PLU-70-PM 51.21

EA 02-2C0900
ID 0200000161
Spring Garden BOH
(Widen & Retrofit)
Br. No. 09-0062

Attention: Mr. MANODE KODSUNTIE

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Report (FR) for Spring Garden BOH

Scope of Work

Per your request dated December 3, 2014, the Office of Geotechnical Design North (OGD-N) presents this Foundation Report (FR) for the proposed widening and seismic retrofit of Spring Garden OH Bridge (Br. No. 09-0062) located on State Route (SR) 70, east of Quincy (P.M. 51.21), in Plumas County.

The scope of work proposed by the Office Bridge Design (OBD) includes widening the existing bridge on both sides to allow for eight-foot wide shoulders, new bridge rails, and seismic retrofit. It also involves the installation of a proposed 260-foot long, 15-foot high soldier pile wall directly behind Abutment 1 (adjacent to the existing retaining wall) to support the left edge of the approach fill. OBD has proposed a soldier pile wall to allow the existing retaining wall to remain in place and keep the roadway open during construction. Foundation recommendations for the proposed soldier pile wall have been provided in a separate report.

The widening and retrofit design does not modify the dimensions of the existing spread footings. Table 8 on page 12 of this report shows the footing data at Bents 2 to 7 and at Abutment 8 for the proposed retrofit and widening. The extended portions of Abutment 1 for the proposed widening will be supported on 30-inch diameter CIDH piles.

This report is based on a review and evaluation of the "As-Built" records of the existing bridge (Br. No. 09-0062), on six new borings performed in October, 2014, on the request memo dated December 3, 2014, and on pertinent geological publications and related reports in the subject bridge file, including the following:

1. Spring Garden BOH (widen), General Plan, 12/09/2014.
2. Final Hydraulic Report, Spring Garden Bridge and Overhead, (BOH), Br. No. 09-0062, Located near Quincy, California, dated October 21, 2014.
3. Preliminary Foundation Report (PFR) for Spring Garden BOH, dated September 19, 2014.
4. Caltrans ARS Online (V2.3.06).
5. Bridge Inspection Report (by Catherine A. Tarala), dated June 4, 2013.
6. District Preliminary Geotechnical Report for Spring Garden OH, by Scott Lewis, dated July 28, 2009.
7. July 2009 Supplemental Project Scope Summary Report (Bridge Replacement) "To Request Programming in the 2008 SHOPP" (under the direction of Mark J. Miller, 9/3/09).
8. BNSF Railway - Union Pacific Railroad: Guidelines for Railroad Grade Separation Projects, by A. Aman (File owner: UPRR, dated: 1/24/07).
9. Preliminary Geology Recommendations, dated March 12, 2002.
10. Addendum to PGR report for APS-Spring Garden Bridge and Overhead, dated March 28, 2002.
11. Preliminary Seismic Design Recommendations for Spring Garden OH, dated March 29, 2002.
12. Geotechnical Scour Evaluation Office Review for Spring Garden OH, (Mark Palmer, Office of Geotechnical Support, e-mail correspondence, dated July 7, 2001).
13. Geologic Map of the Chico Quadrangle (1:250,000) compiled by G.J. Saucedo and D.L. Wagner, 1992.
14. An untitled subsurface investigation, geology and foundation recommendations report for Spring Garden OH, by R.W. Reynolds & C.H. Harned, dated July 9, 1953.

Project Description

According to the December 3, 2014 request memo, OBD is requesting a FR in order to develop Structure P&Q (milestone 3/1/15) and Structure PS&E (milestone 1/1/16) for the widening, rehabilitation and seismic retrofit of Spring Garden BOH (Br. No. 09-0062), located on SR 70 (PM 51.21) east of Quincy, in Plumas County.

The Spring Garden Bridge and Overhead (Spring Garden BOH) structure is located on SR 70, about six miles east of the City of Quincy. It is approximately 426 feet long, 33 feet wide, and it was built in 1956 to convey roadway vehicular traffic on SR 70. The existing bridge spans over Greenhorn Creek, Union Pacific Railroad (UPRR), and the old SR 402A.

Field Investigation and Testing Program

The Office of Geotechnical Design-North conducted a subsurface investigation in October, 2014, for the proposed bridge retrofit and rehabilitation. The purpose of the investigation was to determine the site-specific geology for the Foundation Report.

Four mud rotary soil/rock borings were completed in October, 2014 and April 2015 for the proposed retrofit and widening of Spring Garden Bridge. Borings were drilled at Abutment 1, and at Bents 6 and 7, and at Abutment 8. The borings for Bents 2, 3, 4, and 5 were not drilled due to delays in acquiring right-of-entry permits from UPRR and because the existing bent footings are not planned to be modified. The mud rotary borings were advanced using a self-casing wireline drilling method with a diamond bit for rock coring. The maximum depth achieved was 76 feet into soil and rock (Boring RC-15-004). Standard Penetration Test (SPT) sampling was performed in soil and rock layers where possible. Soil and rock core samples were collected and labeled in core boxes for selective rock sample analysis and storage. A summary of the borings drilled for the bridge during the subsurface investigation is included below in Table 1.

**Table 1. Subsurface Exploration Summary for Spring Garden OH
 (Br. No. 09-0062), 10/2014 & April, 2015.**

Boring No.	Approx. Location	Date Completed	Drill Rig ID	Hammer Type	Hammer Efficiency (%)	Estimated Surface Elevation of Boring (ft)	Boring Depth (ft)	Approx. Bedrock surface Elevation (ft)
RC-15-004	18 ft behind Abut 1	4/14/15	B47	Safety Hammer	53 12/07/05	3872	76	3862
RC-14-009	Near Bent 6 (under the bridge)	10/13/14	Acker (0398)	Automatic	71 4/26/13	3842	55	3840.5
RC-14-010	Near Bent 7 (under the bridge)	10/08/14	Acker (0398)	Automatic	71 4/26/13	3848	59	3846.5
RC-14-011	At Abut 8	10/16/14	Acker (0398)	Automatic	71 4/26/13	3880	60	3875.5

The following datum was used on the Foundation Plan dated 05/14/15 to reference horizontal and vertical positions of the proposed structure:

Horizontal: North American Datum of 1983 NAD83 (1991.35)
Vertical: National Geodetic Vertical Datum of 1929 (GVD29)

The subsurface geologic data will be provided on the Project Log of Test Borings (LOTB) when completed.

The conclusions and recommendations in this report are based on available project records (As-Built Plans, geotechnical reports and geologic literature), as indicated on page 2 under Scope of Work, and on the October 2014, and April 2015, subsurface investigation.

Laboratory Testing Program

Selected rock/soil samples were submitted to the soils laboratory for analyses. The samples were analyzed for corrosion and unconfined compressive strength (qu). Corrosion results are provided under the corrosion section below. The qu results are shown in Table 4 below.

Table 2: Results of Laboratory Analysis of Rock Samples at Spring Garden OH (Br. No. 09-0062)

Sample No.	Location	Sample depth (ft)	Sample Type	Unconfined Compressive Strength (qu) (psi)
RC-14-002-6A	Boring RC-14-002	29.2 to 30	Rock (Serpentinite)	14738
RC-15-004-7A	Boring RC-15-004	32 to 33	Rock (Serpentinite)	5004

A report of the detailed results is provided as part of the attachments to this report.

Site Geology and Subsurface Conditions

The project site is located within the northern part of the Sierra Nevada geomorphic province of California (Norris and Webb 2nd Edition). The Geologic Map of the Chico Quadrangle (Compiled by G.J. Saucedo and D.L. Wagner, 1992) indicates that the site is underlain by serpentinitized ultramafic rocks (um) within the Shoo Fly Complex.

According to Saucedo and Wagner 1992, the Shoo Fly Complex (Pzsf) consists of a mixture of meta-sedimentary, mafic, and ultramafic rocks, including serpentinized ultramafic rocks. The Shoo Fly Complex is mapped as lower Paleozoic (mainly Ordovician-Silurian) in age (Saucedo and Wagner, Geologic Map of the Chico Quadrangle, 1992).

A subsurface foundation investigation was conducted for the subject bridge in July, 1953. The results of the 1953 investigation were used to develop the LOTB for the foundation of the existing bridge. The untitled foundation report, dated July, 1953 and the LOTB, (unknown date), indicate that the 1953 investigation consisted of one rotary sample boring, ten, 1-inch penetration borings and six test pits. According to the 1953 LOTB, borehole numbers 1, 2, 3, 4, 7, 8, 9, 10, 13, & 14 were driven, drilled or dug through soil mantle, sand, boulders and rock fragments, to serpentine bedrock. Borehole numbers 5, 6, 12, 17, and TH-1 & TH-2 (Test Holes 1 & 2), were driven or drilled through fill material to serpentine bedrock. According to the LOTB, the boreholes were driven or drilled to depths of approximately 2 to 20 feet and all were terminated in serpentine bedrock. According to the foundation report dated July 9, 1953, the "entire bridge site is underlain by bedrock at shallow depth consisting of meta-sediments and volcanics of probable Carboniferous and Miocene age." The cited foundation report states that the Recent alluvium in the present stream channel varies in thickness from four to seven feet and lies directly on fresh bedrock. Field observations in 2014 indicate that bedrock is covered in place by a thin yellowish brown residual soil in admixture with sand, cobbles, boulders and other rock fragments. Fresh serpentine rock outcrops were also observed in places across the rugged valley.

The recent field investigation conducted in October 2014, and in April 2015, explored a maximum depth of approximately 76 feet (which corresponds to approximately elevation 3796 feet) in Boring RC-15-004. Borings RC-14-001, 002 and 003 were drilled near the footprint of the proposed soldier pile retaining wall to be constructed behind Abutment 1.

A temporary piezometer was installed in Borings RC-14-010 for groundwater measurement.

The subsurface soil/rock encountered during the October 14, 2014, and April 15, 2015, foundation investigation consists of granular materials comprised of sandy/silty gravel and cobbles overlying mainly serpentine bedrock.

The soil/rock layers encountered can be generalized as follows:

- Upper layer of mainly fill material comprised of medium to dense silty and sandy gravel and cobbles which varies in thickness from 1.5 feet (Borings RC-14-009, and RC-14-010) to ten feet (Boring RC-15-004).
- Bedrock comprised of dark greenish gray, gray, and black serpentinite, which exhibits varying degrees of weathering, fracturing, and hardness. The serpentinite encountered in the borings drilled in for this project was intensely weathered and decomposed in places, to moderately weathered and fresh rock. It ranges in hardness from soft for weathered rock, to moderately hard and very hard for fresh rock. The serpentinite was weathered into a soft, gray and white fibrous mass in places.

The serpentinite was moderately to intensely fractured, and occasionally exhibited two predominant sets of joint/fractures that intersect along the core axis (approximately a northwest-southeast set intersecting a northeast-southwest set). The fracture surfaces were generally serpentinitized and slickensided, but occasionally, the surfaces are filled or lined with clay, or secondary minerals like calcite, and probably talc or magnesite. Some fractures were filled/healed by one or the other secondary minerals mentioned above. In places, distinctly light gray to light green blocks of various sizes comprised of relatively fresh and very hard massive, and granular rock, occurred within the distinct serpentinite bedrock. The parting surfaces of the blocks of rock may or may not be serpentinitized. The massive felsic rocks may represent meta-sedimentary units within the Shoo Fly Complex that underlies the area.

The boring data for this project will be provided on the Log of Test Borings, LOTBs, which will be forwarded when completed.

Groundwater

Based on the As- Built LOTB, groundwater was encountered on July 1, 1953, at elevation 3803 ft (approximately at creek level).

Table 3 below indicates recorded groundwater measurements during October of 2014.

Table 3: Groundwater measurement in Boring RC-14-010 (Br. No. 09-0062)

Boring	Date	Estimated top of boring elevation (ft)	Measured groundwater elevation (ft)	Depth to groundwater (ft)
RC-14-010	10/09/14	3848	3807	41
RC-14-010	10/13/14	3848	3804	44
RC-14-010	10/20/14	3848	3803	45

The average measured groundwater elevation during the October, 2014, investigation is approximately 3804.7 ft.

Scour Evaluation

The Final Hydraulic Report, dated October 21, 2014, concluded that "Due to foundations for Bents 2-7 being supported on scour-resistant, serpentine bedrock and the local presence of serpentine bedrock within the bridge site, effects due to long-term channelbed degradation, contraction scour, local scour, and/or lateral thalweg migration are assumed negligible for a 75-year design period (minimum), which is a typical design period considered for new bridge structures."

Corrosion Evaluation

Soil/rock samples were obtained for corrosion analyses at the locations shown in the table below. Table 4 shows laboratory results for soil/rock samples collected and analyzed during the foundation investigations conducted in October, 2014 and April, 2015.

Table 4: Corrosion Test Summary Report-Ret Wall 50 (Str. No. 09E0006)

SIC Number (TL101)	Sample Location (Boring Number)	Sample Type	Sample Depth (ft)	Minimum Resistivity ¹ (ohm-cm)	pH ¹	Chloride Content ² (ppm)	Sulfate Content ³ (ppm)	Is sample Corrosive?
C874583	R-14-011	Soil/rock	0-8	2508	7.81	-	-	No
C874576	R-15-004	Soil/rock	0-5	2083	8.06	154	35	No
C874577	R-15-004	Soil/rock	10-15	466	6.0	703	12	Yes

Note: For Structural Elements, Caltrans considers a site corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at the site:

pH is 5.5 or less, chloride concentration is 500 ppm or greater, sulfate concentration is 2000 ppm or greater. Resistivity is not considered for structural elements. MSE backfill shall conform to the requirements of section 47-2.0C Structure Backfill in the 2010 Standard Specifications.

The minimum resistivity serves only as an indicator parameter for the possible presence of soluble salts and is not used to define a site as being corrosive. It is the practice of the Corrosion Technology Branch that if the minimum resistivity of the sample is greater than 1000 ohm-cm, the sample is considered to be non-corrosive and testing to determine the sulfate and chloride content is not performed.

Based on these corrosion results, the native soil/rock at the Spring Garden OH Bridge site is corrosive to foundation elements per Caltrans standards as shown in Table 4 by the results of soil/rock sample number RC-15-004 (Abutment 1).

Corrosion Mitigation Measures for Reinforced Concrete

Based on the Caltrans Corrosion Guidelines, Version 2.0, NOVEMBER 2012, "Corrosion protection of reinforced concrete is required in accordance with Section 5 Concrete Structures of California Amendments (to the AASHTO LRFD Bridge Design Specifications - Fourth Edition)."

Seismic Recommendations

Based on the As-Built LOTBs, a V_{S30} (the weighted average shear wave velocity for the top 100 feet of foundation materials) of about 2,000 feet per second is considered applicable for the site.

Based on the "Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations, November 2012," the design ground motion is the highest spectral acceleration as obtained by any or a combination of the following three methods for the bridge site:

- 1) Statewide minimum deterministic spectrum with MMax of 6.5, vertical strike-slip event with a rupture distance of 7.5 miles.
- 2) Deterministic Spectrum from the ARS Online Tool (Version 2.3.06).

3) The USGS 5% Probability of Exceedance in 50 years (975 years return period).

The design Acceleration Response Spectrum (ARS) is determined by method 3 as stated above. The peak ground acceleration is estimated to be 0.30 g. The potential for soil liquefaction is insignificant because there is no loose saturated granular soil at the site.

There are no known faults that are Holocene or younger in age that fall within 1,000 feet of the structure. The structure does not fall within an Alquist-Priolo Earthquake Fault Zone. Therefore, a fault rupture hazard study, per Caltrans Memo To Designers 20-10 of January 2013, is not required.

As-Built Foundation Data

Based on the "As-Built" General Plan (dated circa 1953), the Footing (Foundation) Plan (undated), and the geology and foundation report (untitled), by R.W. Reynolds dated July 9, 1953, the existing Spring Garden Bridge & Overhead was founded at the abutments and bents on spread footings with design load of 5 TSF. According to As-Built LOTB, all the footings were constructed on serpentine bedrock.

Table 5 below shows the design loads and footing elevations for the abutments and the bents of the existing Spring Garden OH Bridge.

Table 5
As- Built Design Loads and Footing Elevations of Spring Garden Bridge & Overhead (Br. No. 09-0062)

Support Location	Design Load (tons/ft ²)	Approx. Footing Elevations (feet)
Abutment 1 (Left) Abutment 1 (Right)	5.0	3848.00 3841.00
Bent 2 (Left) Bent 2 (Right)	5.0	3830.00 3825.00
Bent 3 (Left) Bent 3 (Right)	5.0	3818.50 3823.00
Bent 4 (Left) Bent (Right)	5.0	3799.50 3799.50
Bent 5 (Left) Bent 5 (Right)	5.0	3796.50 3798.50
Bent 6 (Left) Bent 6 (Right)	5.0	3816.00 3822.50
Bent 7 (Left) Bent 7 (Right)	5.0	3837.00 3839.00
Abutment 8 (Left) Abutment 8 (Right)	5.0	3869.00 3867.00

Note: The July 9, 1953 geology foundation report recommended the option to use 10x42 (45 tons) Steel H-piles at Abutment 1, if it was more economical.

Foundation Recommendations

Based on the Final Foundation Report Request from OBD dated December 3, 2014, and on the subject bridge General and Foundation Plans dated June 22 and May 14, 2015, respectively, the design for the widening and retrofit of existing spread footing foundations for Bents 2 through to Bent 7, and at Abutment 8, does not involve the modification of the existing footings. Table 8 below presents the current recommended foundation data for design at Bents 2 to 7 and at Abutment 8.

The extended portions of Abutment 1 for the proposed widening will be supported on Cast-In-Drilled-Hole (CIDH) piles as shown in Table 6 below.

Foundation Recommendations for the Abutment 1 (Br. No. 09-0062)

For the proposed retrofit/widening of the existing Spring Garden Bridge & OH (Br. No. 09-0062), as indicated on the General Plan dated June 22, 2015 and the Foundation Plan dated May 14, 2015, Abutment 1 may be supported on 30-inch Cast-in-Drilled-Hole (CIDH) piles (Rock-Socketed Shafts) according to the table below.

Table 6: Abutment 1 Foundations Design Recommendations (Spring Garden OH Br. No. 09-0062)

Support	Pile	Cut-off Elevation (ft)*	WSD Service-I Limit State Load (kips) per Support		WSD Service-I Limit State Total Load (kips) per Pile (Compression)	Nominal Resistance (kips)	Design Pile Tip Elevation (ft)	Specified Pile Tip Elevation (ft)
			Total	Permanent				
Abut 1 (Right)	30-inch CIDH Piles	3863.50	121	93	163	330	(a) 3834.0	3834.0
Abut 1 (Left)	30-inch CIDH Piles	3863.50	245	142	182	370	(a) 3832.0	3832.0

* Bottom of Abutment 1 Elevation provided in an e-mail from OBD dated 12/30/14.

1. Design tip elevations are controlled by (a) Compression.
2. The CIDH specified tip elevation shall not be raised.
3. The specified tip elevation shall not be raised above the designed tip elevation for Lateral Load.
4. Uncertain soil layers (Fill?) that do not contribute to the design nominal resistance exist at Abutment 1 and extend to approximately elevation 3852 ft for the right and left footing locations.
5. A minimum rock socket length of 18 feet is recommended for Abutment 1 right and 20 feet for Abutment 1 left.

Table 7: Pile Data Table (Abutments 1 Right & Left Br. No. 09-0062)

Location	Pile Type	Nominal Resistance (kips)		Design Pile Tip Elevation (ft)	Specified Pile Tip Elevation (ft)
		Compression	Tension		
Abut 1 (Right)	30-in CIDH Piles	330	0	(a) 3834.0	3834.0
Abut 1 (Left)	30-in CIDH Piles	370	0	(a) 3832.0	3832.0

Notes:

1. Design tip elevations are controlled by (a) Compression.
2. The CIDH specified tip elevation shall not be raised.
3. The specified tip elevation shall not be raised above the designed tip elevation for Lateral Load
4. Uncertain soil layers (Fill?) that do not contribute to the design nominal resistance exist at Abutment 1 and extend to approximately elevation 3852 for the right and left footing locations.
5. A minimum rock socket length of 18.0 feet is recommended for Abutment 1 Right and 20 feet for Abutment 1 left.

In determining the geotechnical capacity of the CIDH pile foundations recommended in this report, the procedures described in the National Cooperative Highway Research Program (NCHRP) Synthesis 360, titled "Rock-Socketed Shafts for Highway Structure Foundations, A Synthesis of Highway Practice" Transportation Research Board of the National Academies, were utilized.

Foundation Recommendations for the existing Spread Footings at Bents 2 to 7 and at Abutment 8 (Br. No. 09-0062).

Bents 2 to 7 of Spring Garden OH (Br. No. 09-0062) may be supported on the existing spread footings. Abutment 8 will be extended/widen to accommodate the proposed widening of the bridge. The extended/widened portion of Abutment 8 will be on new spread footings.

Table 8 below presents foundation recommendations for Bent 2 to 7 and for Abutment 8.

Table 8: Foundation Design Recommendations for Spread Footings

Support Location (existing footings)	Footing Size (ft)		Bottom of Footing Elevation (ft)	Maximum Footing Embedment Depth (ft)	Total Permissible Support Settlement (inches)	LRFD		
	B	L				Service Limit State	Strength or Construction Limit State $\phi_b = 0.45$	Extreme Limit Event $\phi_b = 1.00$
Bent 2 Left	9	9	3830.0	10.0	< 1	48.6	22.5	50
Bent 2 Right	9	9	3825.0	15.0	< 1	48	22.5	50
Bent 3 Left	11	11	3818.5	15.5	< 1	48	22.5	50
Bent 3 Right	11	11	3823.0	11.0	< 1	48.5	22.5	50
Bent 4 Left	12	10	3799.5	8.5	< 1	49	22.5	50
Bent 4 Right	12	10	3799.5	6.5	< 1	49	22.5	50
Bent 5 Left	12	10	3796.5	8.5	< 1	49	22.5	50
Bent 5 Right	12	10	3798.5	7.5	< 1	49	22.5	50
Bent 6 Left	11	11	3816.0	14.0	< 1	48	22.5	50
Bent 6 Right	11	11	3822.5	9.5	< 1	48.7	22.5	50
Bent 7 Left	9	9	3837.0	8.0	< 1	49	22.5	50
Bent 7 Right	9	9	3839.0	10.0	< 1	48.6	22.5	50
Abutment 8 Left widening (new footing)	9.75	7.54	3867.5	6.5	< 1	49.5	22.5	50
Abutment 8 Right widening (new footing)	7.75	11.42	3865.5	9.5	< 1	49	22.5	50

General Note to Designer

1. Lateral tip elevations for the CIDH piles recommended in this report will be provided by OBD.

Construction Considerations

A. CIDH Piles

1. Groundwater was measured at approximately elevation 3804 ft during the October 2014 subsurface investigations for the proposed retrofit/widening, which is below the pile tip elevations recommended in this FR. However, during construction of the CIDH pile shafts, the Contractor should anticipate water in the shafts resulting from seepage of storm water, or from perched water trapped within the fractured bedrock. Pumping of water to keep the shaft dry should therefore be expected during construction and installation of the CIDH piles.
2. Fill material comprised of sand, silt, cobbles and possible boulders overlie the bedrock at the site. If necessary, the Contractor has the option to utilize temporary casings up to elevation 3852 to prevent caving of the fill materials and rock fragments from weathered and fractured bedrock. If utilized, the temporary casing must be removed during the pouring of the pile.
3. If utilized, the temporary casing can be installed by drilling or vibrating in place. Drilling to install the casing will encounter difficulty through the hard cobbles and possible boulders in the fill. It is therefore advisable for the Contractor to anticipate drilling through large and hard boulders and be prepared with tools and equipment for coring through boulders to install the casing.
4. The geotechnical capacity of the CIDH piles at all support locations at Abutments 1 for the proposed bridge retrofit/widening, is derived from side resistance (skin friction) resulting from the shear stress that develops at the concrete-rock interface along the sides of the shaft. The piles must, therefore, be installed to the recommended tips specified in the pile data table to achieve the required embedment. No end bearing is considered for design capacity.
5. The CIDH piles at Abutment 1 are designed for a minimum embedment into bedrock socket of 18 and 20 feet respectively for Abutment 1 right and left. The geotechnical bearing socket starts from elevation 3852 feet to the specified tip elevations shown in the pile data table provided in this report for the right and left CIDH piles at Abutment 1.
6. The bedrock generally ranges in hardness from soft to very hard, but is mostly fractured. The Contractor should therefore be prepared for vertical and horizontal variations in hardness when coring the CIDH shafts.

7. The CIDH pile shafts should not be left open any longer than necessary for placement of the concrete. Cage placement and concrete pour should be done as soon as the excavation has reached the specified tip elevation.
8. The dry method is anticipated for the installation of the CIDH piles but if excessive seepage of storm and/or perched water dictates pile construction in the wet condition, the piles will need to be gamma-gamma tested.
9. The tools and equipment that are planned for use by the Contactor should be described in the Contractor's drilled shaft installation plan and the equipment actually used documented in the construction records.
10. The occurrence of serpentinite at the site may indicate the presence of asbestos. We recommend that the North Region Hazardous Waste Coordinator be contacted for additional recommendations.
13. The Office of Geotechnical Design-North should be invited to a pre-construction meeting.

B. Spread Footings

1. Excavation for the construction and placement of the new footings at Abutment 8 may encounter hard rock.
2. Concrete for the construction of the new footings at Abutment 8 shall be placed neat on clean rock surface at the specified bottom of footing.

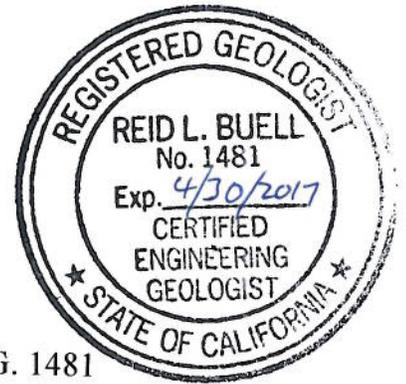
The recommendations contained in this memorandum are based on specific project information regarding structure type, and location that have been provided by OSB. If any conceptual changes to the structure are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the foundation recommendations herein provided are still applicable.

If you have any questions or need further information regarding this report, please contact Abu Barrie at (916) 227-1043, Reid Buell (916) 227-1012, John Huang (916) 227-1037.

Report by:

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Attachments: (1) ARS curve
(2) Lab Results

cc: Deena Matagulay, District Project Manager (e-copy)
Eskinder Taddese, Project Liaison Engineer (e-copy)
Chris Quiney District Environmental Planner (e-copy)
District Materials Engineer –
GS Corporate

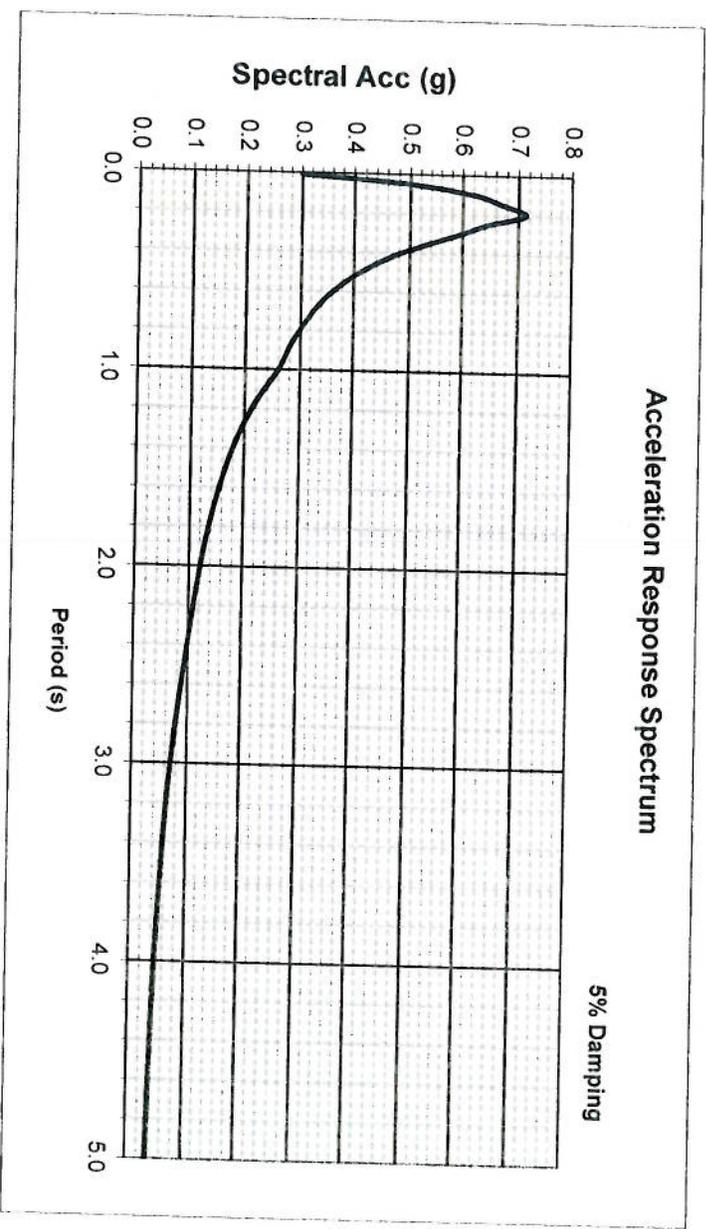
Spring Garden BOH

Bridge No. 09-0062
 EFIS 0200000161

Latitude 39.911711
 Longitude -120.81270

Control Probabilistic

Period (s)	Sa(g)
0.010	0.299
0.050	0.498
0.100	0.621
0.150	0.673
0.200	0.713
0.250	0.645
0.300	0.595
0.400	0.484
0.500	0.412
0.600	0.361
0.700	0.325
0.850	0.286
1.000	0.259
1.200	0.213
1.500	0.167
2.000	0.122
3.000	0.070
4.000	0.046
5.000	0.035



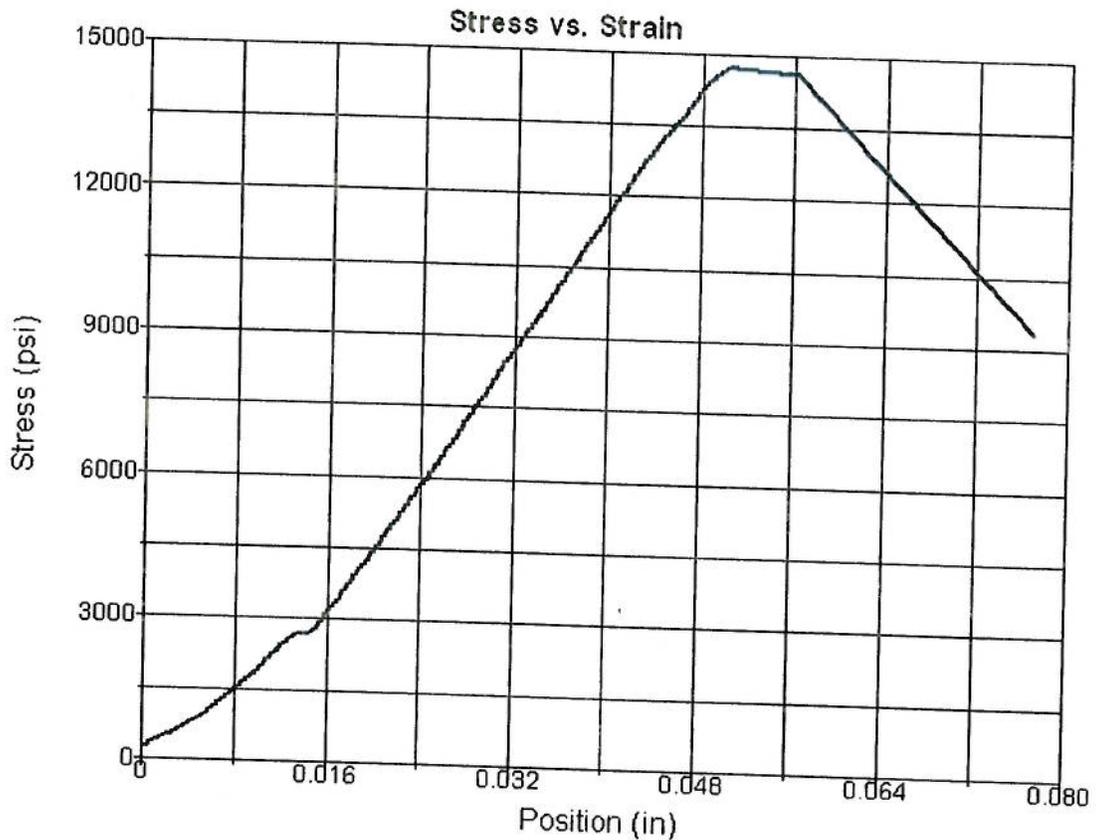
Deterministic Procedure Data

Fault Butt Creek fault zone
 Fault ID 48
 Style SS
 Mmax 7
 Dip 90 deg
 ZBOR 8 mi
 ZTOR 0 mi

R_{rup} 13.0 mi
 R_{yb} 13.0 mi
 R_x 5.0 mi
 V_{s30} 2000 ft/s
 Z_{1.0} N/A ft
 Z_{2.5} N/A mi

Notes: Please note the Design ARS curve is based on the USGS 5% Probability of Exceedance in 50 years (975 years return period).

Final Design Response Spectrum



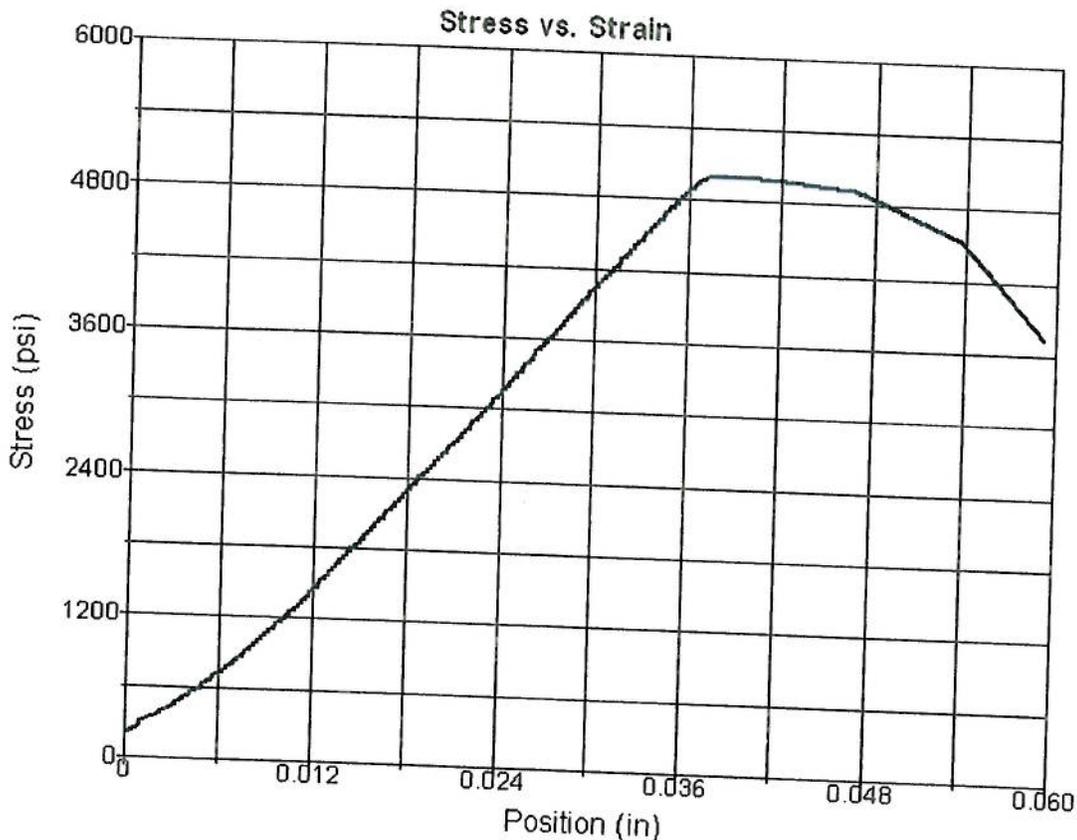
Test Summary

Test Results

Sample: RC-14-002-6A
Depth: 29.2
Description: Light greenish gray metamorphic rock. fine to medium grained and massive w/near vertical felsic veins(core-axis).
Dist-EA: 02-2C0900
Location: 02-PLU-70-50.3-50
Project: SPRING GARDEN OH BRIDGE
GL #: 15-029
Ticket: Q15-037
Procedure Name: ASTM D7012 Method C
Start Date: 5/29/2015
Elapsed Time: 00:06:51
Workstation: DIK00YB1
Operator: AZM
Moisture Condition: As-Received, Not Tested
Non-Conformances: Flatness
Comments: Best Effort Conform.; Test As-Is

Specimen Gage Length: 5.5200 in
Diameter: 2.3890 in
Area: 4.4825 in²
Maximum Load: 66061 lbf
Compressive Strength: 14738 psi
Peak Load Rate: 1.52e+005 lbf/min





Test Summary

Sample: RC-15-004-7A
Depth: 32
Description: Dark greenish gray - black serpentinite. Foliated and intensely fractured; fractures infilled by secondary minerals.
Dist-EA: 02-2C0900
Location: 02-PLU-70-50.3-50
Project: Spring Garden OH Bridge
GL #: 15-029
Ticket: Q15-038
Procedure Name: ASTM D7012 Method C
Start Date: 6/3/2015
Elapsed Time: 00:02:15
Workstation: D1K00YB1
Operator: AZM
Moisture Condition: As-Received, Not Tested
Non-Conformances: Flatness
Comments: Best Effort Conform.; Test As-Is

Test Results

Specimen Gage Length: 5.2700 in
Diameter: 2.3890 in
Area: 4.4825 in²
Maximum Load: 22430 lbf
Compressive Strength: 5004 psi
Peak Load Rate: 1.03e+005 lbf/min



For Contract No. 02-2C0904

MATERIALS INFORMATION

Final Hydraulic Report for Spring Garden Bridge and Overhead (Bridge No. 09-0062)

FINAL HYDRAULIC REPORT

Spring Garden Bridge and Overhead (BOH)

Br. No. 09-0062

Located near Quincy, California

PROJECT

DESCRIPTION: Proposed Widening, Rehabilitation, and Seismic Strengthening

LOCATION: 02 - PLU - 70 - PM 51.21

EA (EFIS): 02-2C0900 (02 0000 0161)

DATE: October 21, 2014

Prepared by:



Jose J. Vargas, P.E.
Registered Civil Engineer
Registration Number C 65612



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(NOTE: Except for FIGURES 1 & 6, all ATTACHMENTS are based on outputs from the HEC-RAS Program.)

General Notes:

- 1) *The source of ground elevation data for this study is the survey data file (CAiCE file format) provided by District 2 in the Bridge Site Submittal (BSS) in May 2014. The vertical datum referenced for the survey data is the National Geodetic Vertical Datum of 1929 (NGVD29). All reported elevations are rounded off to 0.1 feet.*
 - 2) *The peak discharges used for this study considered a 20% reduction due to assumed peak flow attenuation attributed to upstream railroad culvert conveyance capacity limitations and storage effects of the Williams Loop lake/wetland area.*
 - 3) *The 1956 "As-Built" General Plan (GP) Sheet indicates Beginning of Bridge (BB) and End of Bridge (EB) stations of 48,097.17 feet and 48,522.83 feet and BB/EB elevations of 3,872.25 feet and 3,879.73 feet, respectively. Applicable adjustments may be necessary to adjust the reported values to match current project stationing and/or datums if the BB and EB stations/elevations on the currently-proposed GP sheet do not match the "As-Built" values.*
-

GENERAL INFORMATION

The existing Spring Garden Bridge and Overhead (BOH) Structure (Br. No. 09-0062) is located on State Highway 70 in Plumas County near Quincy, California. The bridge structure spans over Greenhorn Creek and an existing Railroad (RR) facility. The proposed project consists of widening, rehabilitation, and seismic strengthening of the existing bridge structure. Although this project is currently in the Preliminary or "0" (zero) Phase, the Final Hydraulic Report (FHR) was requested by Bridge Design Branch 1. A proposed General Plan sheet (print date of 8/18/14) provided by Bridge Design Branch 1 was used in preparation of this report.

For information purposes, the existing Spring Garden BOH structure was built in 1956 (never widened) and is a 7-span, Simply-Supported Steel Girder (4) Spans Composite with a Reinforced Concrete (RC) deck on RC caps on two RC Column Bents and RC Bent-Style Abutment at Abutment 1 and a RC Seat Abutment at Abutment 8. All abutments and bents are supported on spread-footing foundations. The structure depth (deck plus girder) is 3.5 feet and the total bridge length and width is 425.7 feet and 33.3 feet, respectively. The rectangular columns at Bents 2-7 are generally aligned in the main flow direction (i.e. no significant hydraulic skew is assumed) and have chamfered edges/corners. In plan (cross-section) view, each rectangular column is 3.0 feet by 5.0 feet (dimensions measured perpendicular and parallel to the main flow direction, respectively).

Based on the proposed General Plan sheet provided by Bridge Design Branch 1, the proposed project includes two main changes to the existing bents. The existing bent caps will be widened to accommodate the widened deck superstructure and include new concrete corbels at Bents 4-7 and steel corbels at Bents 2 and 3 due to clearance restrictions around the existing railroad tracks. The bent cap modifications are not expected to impact the existing hydraulic conditions since the bent caps are located above the active waterway area. Infill walls will be added to connect the two existing (individual) columns at each bent location (Bents 2-7). The new infill walls will be supported on the existing spread-footing foundations at Bents 3-6 and new small footings will be installed beneath the infill walls (between the existing footings) at Bents 2 and 7. At this time, it appears that no changes are necessary to the existing foundations, mainly due to the footings being supported on serpentine bedrock.

DESCRIPTION OF BRIDGE SITE

The bridge site is located just downstream and northwest of the “*Williams Loop*” (a local spiral-loop section of railroad which provides for gradual elevation changes/transitions). The bridge site is located within a roughly 900-foot section of Greenhorn Creek which is bounded by two railroad culverts. The bounding upstream (U/S) and downstream (D/S) railroad culverts are located roughly 600 feet and 300 feet away from the bridge site, respectively. For this report only, the “*upstream*” and “*downstream*” railroad culverts refer to the two bounding culverts, unless otherwise noted.

Based on available aerial and Google Maps (Street View) images, flow entering the 900-foot bounded channel section of Greenhorn Creek is mainly controlled by the upstream railroad culvert, which conveys flow from the lake/wetland area located within the Williams Loop. The two main sources of flow entering the Williams Loop lake/wetland area are two local railroad culverts: one located on the northern end of the loop and one located on the eastern side of the loop. Some additional local wetland/floodplain areas are located just upstream of the eastern culvert. Further upstream from the eastern culvert (along the main channel), there is a series of additional railroad culvert crossings. (**Refer to FIGURE 1 on Page 12**)

At this time, there is no information available regarding any of the upstream railroad culverts (i.e. type, dimensions, slope, invert elevations, design capacity, etc.). Based on the CAiCE survey data, the downstream railroad culvert is described as a Reinforced Concrete Box (RCB) culvert with noted dimensions of 13 feet wide by 12 feet high. However, considering some potential inaccuracy of the noted culvert descriptions and based on preliminary model sensitivity analysis results, a square-shaped culvert of 14 feet (culvert opening size) was assumed for modeling purposes. Although the actual details for the other local railroad culverts are unknown, this study generally assumes all the local railroad culverts are of similar type, dimensions, and conveyance capacity.

PEAK DISCHARGES

Peak discharge estimates for the Greenhorn Creek watershed at the bridge site were determined based on the United States Geological Survey (USGS) regional regression methods currently available (Reference: USGS Scientific Investigations Report, SIR, 2012-5113). The basin parameters required for the regional regression equations were determined based on a watershed delineation using the online “USGS StreamStats” software program. For comparison purposes, the watershed delineation and drainage area determined using the online tool was confirmed using other available software (Watershed Modeling System, WMS, Version 9.1) and current USGS elevation data available online.

Based on the USGS StreamStats results, the watershed drainage area for the bridge site is roughly 35.3 square miles, the mean annual precipitation is 48.5 inches, and the average basin elevation is 5,504 feet. The calculated 50-year and 100-year frequency discharges for the bridge site are roughly 5,140 cubic feet per second (cfs) and 6,630 cfs (values rounded to the nearest 10 cfs), respectively. It may be noted that the 50-year and 100-year frequency discharge events may also be referred to as the 2% and 1% Annual Exceedance Probability (AEP) flood, respectively.

Actual flows observed in the channel at the bridge site at any time may vary significantly due to many variable factors, including snowpack melt runoff, additional localized surface runoff, conveyance limitations of local railroad culverts, and basin storage effects. The actual peak flow (magnitude) observed at the bridge site may be directly affected by two site-specific factors: local railroad culvert conveyance capacities and storage effects of the Williams Loop lake/wetland area. These two factors may attenuate the peak discharge actually reaching the bridge site. Due to the difficulty of accurately quantifying the peak flow reduction based on limited information, a 20% peak discharge reduction at the bridge site was assumed for this study. Therefore, the adjusted 50-year and 100-year frequency discharges considered for this study are 4,110 cfs and 5,300 cfs, respectively. *(Refer to TABLE 1)*

The current Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for this area were reviewed for peak discharge comparison and/or hydraulic model calibration purposes; however, the current studies do not include any detailed discharge or stage (WSEL) information for the bridge site.

TABLE 1 - Estimated Peak Discharges

Frequency Discharge	AEP Flood	Calculated Peak Discharge, cfs	Adjusted Peak Discharge, cfs
50-Year	2%	5,140	4,110
100-Year	1%	6,630	5,300

AEP = Annual Exceedance Probability

NOTES:

- 1) *The **Calculated Peak Discharge** is based on a total drainage area of 35.3 square miles and assumes no peak flow attenuation.*
- 2) *The **Adjusted Peak Discharge** considers an assumed 20% reduction for peak flow attenuation due to local railroad culvert conveyance capacity limitations and storage effects of the Williams Loop lake/wetland area.*
- 3) *Estimated discharges are rounded off to the nearest 10 cfs.*

HYDRAULIC MODEL INFORMATION

For the purpose of evaluating potential hydraulic impacts due directly to the proposed project, existing and proposed conditions were simulated using HEC-RAS (Version 4.1.0) hydraulic modeling software. The Hydrologic Engineering Center - River Analysis System (HEC-RAS) is a one-dimensional hydraulic analysis program developed by the U.S. Army Corps of Engineers (USACE). A hydraulic model for both existing and proposed conditions was created using HEC-RAS software based on geometric data provided by survey data, bridge/channel design details from As-Built and proposed plan sheets, and other necessary assumptions required to run the model. Considering the significant freeboard available below the bridge soffit and that both abutments are located high on each side of the canyon (outside the main channel waterway area), the hydraulic model only included Bents 2 through 6 (i.e. Abutments 1 and 7 are not included). *(Refer to FIGURE 2 and FIGURE 3 on Page 13)*

For general comparison and evaluation purposes, preliminary hydraulic models for the bridge site considered cases with and without backwater effects due to the downstream railroad culvert. As expected, the calculated hydraulic results between the two models varied significantly. As compared to the model considering backwater conditions, the “no backwater” model resulted in lower local WSEL values and higher local peak (water) velocity values at the bridge site. Based on site-specific factors and current assumptions, the backwater case was considered to be more applicable for this site; therefore, the results provided in this report are based on the hydraulic model with backwater conditions.

The existing bridge has two-column bents; the proposed project will add new infill walls between the two individual columns at each bent location. The new infill walls will be supported on the existing spread-footing foundations. For bridge modeling purposes, the existing and proposed conditions within the main (active) waterway area would remain identical except for the addition of the proposed infill walls. Considering the limitations of using a one-dimensional hydraulic model and for comparison purposes, the existing and proposed models only vary based on the selected bridge modeling approach (the hydraulic calculation method in HEC-RAS). The Existing Conditions model assumes the energy-based method while the Proposed Conditions model assumes the momentum-based method (the momentum-based solution was assumed to better simulate the potential effect of the “new” pier walls).

Survey Data for Hydraulic Model

Survey data for creating the hydraulic models was provided by District 2 (CAiCE electronic file) in the Bridge Site Submittal (BSS) sent to Preliminary Investigations - North (P.I.-North) in May 2014. The survey data included survey points and Digital Terrain Model (DTM) surface for the channel located within the study area. The P.I. Survey Information Sheet provided with the BSS indicates the survey data was referenced to the National Geodetic Vertical Datum of 1929 (NGVD29). Assuming the 1956 As-Built plan sheets for the existing bridge are also based on NGVD29, all elevation data is referenced to the NGVD29 vertical datum.

The geo-referenced elevation data was imported into the Watershed Modeling System (WMS, Version 9.1) software program in order to process the elevation data and obtain cross-section data for the hydraulic (HEC-RAS) model. Model sensitivity analysis was completed to determine the final cross-section configuration (location, orientation, spacing, etc.). Representative cross-section data from WMS was exported to HEC-RAS to create the baseline hydraulic model. Bridge details for the existing and proposed conditions and other necessary information (Manning’s “*n*” values, culvert details, etc.) were incorporated into the model to provide the best representation of local hydraulic conditions. For information purposes, the upstream and downstream model limits (distances measured along the main channel alignment) are roughly 350 feet and 910 feet away from the bridge, respectively.

Manning's Roughness Coefficients

Representative Manning’s (“*n*”) roughness coefficients for the hydraulic model were estimated to account for relative differences in roughness (based on surface/material/vegetation coverage/local flow depths/etc.) for areas located within each cross-section. Based on aerial photos of the site and engineering judgment, Manning's “*n*” values of 0.038, 0.042, and 0.068 were selected for this study.

A value of 0.038 was selected for the main channel areas and 0.068 was selected for areas within and/or adjacent to the general channel area and other areas with medium to heavy vegetation/brush cover. A value of 0.042 was assumed for general floodplain/overbank areas located outside the main channel areas. It should be noted that the HEC-RAS program was allowed to composite Manning's "n" values where deemed appropriate based on its default criteria; composited values were reviewed for overall reasonableness.

WATER SURFACE ELEVATIONS

As noted previously, estimated water surface elevations (WSEL's) are based on backwater conditions at the bridge site due to the railroad box culvert located downstream of the bridge. For WSEL change evaluation purposes, two reference locations were considered for the bridge site at the extreme upstream and downstream bridge face locations. Based on calculated HEC-RAS results at the two reference locations, the WSEL's based on the existing and proposed conditions are shown below in **TABLE 2**. It should be noted that due to many factors affecting calculated water surface elevations values, all estimated WSEL's reported in this study are rounded off to 0.1 feet. (*Refer to FIGURES 4A & 4B and FIGURE 5 on Page 14*)

TABLE 2 - WSEL Comparison at Bridge Site (100-Year Discharge)

HEC-RAS River Station	River Station Reference Location	Condition	WSEL (feet, NGVD29)	WSEL Difference (feet)
942.6 (feet)	Upstream Face of Bridge	Proposed	3,831.5	+ 0.2
		Existing	3,831.3	
908.6 (feet)	Downstream Face of Bridge	Proposed	3,831.2	0
		Existing	3,831.2	

NOTES:

- 1) WSEL at the upstream/downstream face of bridge at the intersection with the main channel alignment.
- 2) Calculated WSEL values from HEC-RAS output; all reported WSEL's in this study are rounded off to 0.1 feet.

PEAK VELOCITY

Based on the estimated discharges for Greenhorn Creek, a local peak (water) velocity of roughly 5 feet per second (ft/s) is estimated at the bridge site. It should be noted that the reported peak velocity is based on backwater conditions due to the railroad culvert located downstream of the bridge site. It may be noted that preliminary hydraulic models not considering backwater conditions and/or assuming lower Manning's roughness coefficient values than used for this study resulted in significantly higher local peak velocities at the bridge site.

WATERWAY CAPACITY & MINIMUM BRIDGE SOFFIT ELEVATION

The existing Spring Garden BOH structure was built in 1956 and spans over Greenhorn Creek and an existing Railroad facility (railroad track). The Bridge Inspection Records Information System (BIRIS) was reviewed for any records or reports regarding historical highwater information or any localized overtopping at the existing bridge site. No historical highwater or overtopping records were located to help calibrate the hydraulic model and/or for general WSEL comparison purposes.

As a railroad overcrossing structure, the bridge (soffit) must provide a minimum local vertical clearance above the railroad track in order to meet specific railroad requirements. Based on the estimated peak discharges and site conditions assumed for this study, the hydraulic model results indicate that high water is not expected to reach the top of local railroad (track) embankment within the vicinity of the bridge. For information purposes, the approximate average elevation of the top of railroad (track) embankment underneath the existing bridge is 3,841 feet.

In the event of very extreme flood conditions, the water surface elevation in Greenhorn Creek would be expected to rise until it reaches the top of local channel banks. Once the local maximum channel conveyance capacity is exceeded, excess flows would begin to exit the channel through localized overtopping (overbanking) via low bank areas located adjacent to the channel. Considering the significant amount of freeboard available underneath the bridge deck/soffit, no issues related to waterway (conveyance) capacity or water reaching the bridge deck/soffit are anticipated at this site.

DRIFT POTENTIAL

Based on the geographic location of the bridge site and potential sources of floating drift/debris located near the channel, there is some potential for drift/debris to pass through the bridge site. Available bridge maintenance inspection records for the existing Spring Garden BOH structure were reviewed for any historical drift information at this site. No records regarding significant drift accumulation at the bridge piers were located, which may suggest that significant drift/debris accumulation is not generally an issue at the existing piers. In addition, it is expected that any significant amount of drift/debris which may accumulate at the pier locations during significant flood events would be periodically removed by Caltrans Maintenance or others, as required.

The existing Spring Garden BOH structure has six (two-column) bents, each with 3.0-foot thick columns (dimension perpendicular to the main flow direction) with chamfered edges/corners. The orientation of the existing bents is generally aligned in the direction of high flows (i.e. no hydraulic skew is assumed at the columns/bents). Within the main (active) waterway area, the proposed project will add new infill walls between the two existing columns at each bent location. The infill walls will be supported on the existing spread-footing foundations; the existing footings will remain unchanged. From a strictly hydraulic perspective and as compared to the existing two-column bents, the single pier configuration of the new “pier walls” may help streamline localized flow around the entire pier and may reduce overall floating drift/debris accumulation potential at the piers by eliminating the current open space between the two existing columns where drift/debris may tend to catch.

POTENTIAL SCOUR & LONG-TERM CHANNEL CHANGES

Potential scour for a bridge is evaluated based on the current Hydraulic Engineering Circular No. 18 (HEC-18) Manual, “*Evaluating Scour at Bridges*” (5th Edition, April 2012). **Total scour** at a highway crossing generally consists of three main components: **long-term degradation** of the river bed, **contraction scour** at the bridge, and **local scour** at the piers or abutments. Potential **thalweg migration** to the pier locations and abutments is also evaluated as part of the scour analysis procedure.

An evaluation completed in 2001 (email dated 7/19/01) of the As-Built Plans by Mark Palmer of Geotechnical Services indicated, “*As interpreted from the as-builts: Bents 4 & 5 are supported by spread footings located in the active portion of the channel on fresh, sufficiently scour resistant, serpentine bedrock. Scour does not appear to be a problem at these supports. Bents 3 & 6, also supported by spread footings, are located higher up on the channel slopes and are also founded on the serpentine bedrock. Scour does not appear to be a problem at these supports either.*”

The 2001 geotechnical assessment indicates the existing bridge foundations at Bents 3-6 are supported on “*sufficiently scour resistant, serpentine bedrock*”. Although not included in the review, the spread-footing foundations at Bents 2 and 7 are also supported on local serpentine bedrock based on the As-Built Plans. For scour evaluation purposes, the existing spread-footing foundations at all bent locations (Bents 2-7) are assumed to be supported on local scour-resistant serpentine bedrock. Based on current information provided by Bridge Design Branch 1, the existing foundations will remain unchanged. The proposed infill walls between each existing two-column bent will be supported on the existing foundations and not require any retrofitting to the existing footings or the addition of any new footings at Bents 3-6. A small footing will be installed beneath the infill wall between the existing footings at Bents 2 and 7. If retrofitting and/or additional footings are later determined to be required for the infill walls, it is recommended the retrofitted/new footings match or use similar details as the existing spread-footing foundations (i.e. dimensions, orientation, footings supported on local serpentine bedrock, etc.).

Due to the presence of local scour-resistant serpentine bedrock at this site and also supporting the existing spread-footing foundations, the bridge foundations are not expected to be significantly affected by potential long-term degradation, contraction scour, local scour, and/or thalweg migration effects. Potential effects due to these scour-related factors are assumed negligible for a 75-year design period (minimum), which is a typical design period considered for new bridge structures. In the event that an updated Geotechnical Services assessment determines the local serpentine bedrock is not scour resistant, an updated scour evaluation may be necessary.

Long-Term Degradation

Historical cross-section data for the existing Spring Garden BOH structure was located for the following years: 1956 (As-Built LOTB), 1992, and 2007. Comparing the 1992 and 2007 recorded channel profiles at the upstream side of bridge, the two channel cross-sections appear very similar, especially within the main (active) channel area (Bents 3-6). For general comparison purposes, the 1992 and 2007 cross-sections also appear similar to the “*existing ground profile*” shown on the 1956 As-Built LOTB sheet. It should be noted the 1956 channel profile represents the “existing ground line” along the bridge layout line (along the main bridge centerline, not the upstream face) and is included for general comparison purposes only. (*Refer to FIGURE 6 on Page 15*)

Riverine environments are naturally dynamic and may be expected to change over time. Some variation of local channelbed elevations may be expected due to natural cycles of gradual sediment deposition (aggradation) and/or degradation over time due to varying flow conditions and other factors. The limited available cross-section data and DTM survey data suggest the main channel area (Bents 3-6) at the existing bridge site has been relatively stable overall (vertically and horizontally) since the bridge was built. The presence of local scour-resistant serpentine bedrock is assumed to provide the general vertical and horizontal stability of the channelbed at the bridge site.

Thalweg Migration

For information purposes, the estimated thalweg elevations at the existing upstream and downstream faces are roughly 3,804.0 feet and 3,802.0 feet, respectively. For general comparison purposes, an estimated thalweg elevation of approximately 3,802 feet is indicated on the “existing ground profile” shown on the 1956 As-Built LOTB sheet for the existing bridge.

ADDITIONAL CONSIDERATIONS

Caltrans Geotechnical Services Recommendations

As previously discussed, this study assumes the existing spread-footing foundations at all bent locations are supported on local scour-resistant serpentine bedrock as indicated on the As-Built Plan Sheets and noted in the 2001 evaluation by Geotechnical Services. In the event that updated geotechnical information and/or an updated Geotechnical Services assessment determines the local serpentine bedrock is not scour resistant, an updated scour evaluation may be necessary.

Environmental Restrictions / Permits

It is unknown what specific environmental-related restrictions, constraints, agreements, and/or permits exist or may be applicable at this bridge location. If applicable, additional and significant coordination may be necessary with Local, State, and Federal agencies and/or other entities involved in order to successfully obtain all necessary permits within the desired timeframe and minimize potential project delays.

SUMMARY INFORMATION FOR THE BRIDGE DESIGNER

NOTE: Unless otherwise specified, elevations in this report are referenced to the National Geodetic Vertical Datum of 1929 (NGVD29). Reported elevations are rounded off to 0.1 feet.

- The P.I. Survey Information Sheet provided with the BSS for the CAiCE survey data indicates elevations are based on the NGVD29 vertical datum. If significant elevation (vertical datum) differences are encountered, applicable adjustments may be necessary to adjust the reported values to match current project stationing and/or datums.
- Local Peak (Water) Velocity at Bridge Site = 5 ft/s
(based on backwater conditions due to the downstream railroad culvert)
- Estimated Current Thalweg Elevation at Bridge Site = 3,802.0 feet
(based on HEC-RAS model cross-section at the downstream face of bridge)
- Based on available information, the existing spread-footing foundations for Bents 2-7 are supported on serpentine bedrock that is considered to be scour resistant. If Geotechnical Services determines otherwise, an updated scour evaluation may be necessary.
- Due to existing foundations for Bents 2-7 being supported on scour-resistant, serpentine bedrock and the local presence of serpentine bedrock within the bridge site, effects due to long-term channelbed degradation, contraction scour, local scour, and/or lateral thalweg migration are assumed negligible for a 75-year design period (minimum), which is a typical design period considered for new bridge structures.

TABLE 3 - Hydrologic / Hydraulic Summary

Hydrologic / Hydraulic Summary			
Total Drainage Basin Area: 35.3 square miles			
	Design Flood	Base Flood	Overtopping Flood
Frequency, years	50	100	N/A
Discharge, cfs	4,110 *	5,300 *	N/A
Water Surface Elevation at Bridge, feet	3,821.6 **	3,831.5 **	N/A
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

NOTES:

- * *The reported discharges at the bridge site consider an assumed 20% reduction for peak flow attenuation due to local railroad culvert capacity limitations and storage effects of the Williams Loop lake/wetland area.*
- ** *Calculated WSEL at the upstream face of the bridge.*

LIST OF ACRONYMS

AEP	Annual Exceedance Probability
BB	Beginning of Bridge
BIR	Bridge Inspection Report
BIRIS	Bridge Inspection Records Information System
BOH	Bridge and Overhead
BSS	Bridge Site Submittal
CAiCE	Computer-Aided Civil Engineering (<i>software program</i>)
Caltrans	California Department of Transportation
cfs	cubic feet per second
D/S	downstream
DHIPP	Digital Highway Inventory Photography Program (Caltrans)
DTM	Digital Terrain Model
EB	End of Bridge
EOW	Edge of Water
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map (FEMA)
FIS	Flood Insurance Study (FEMA)
FHR	Final Hydraulic Report
GP	General Plan
HEC-18	Hydraulic Engineering Circular No. 18 <i>"Evaluating Scour at Bridges"</i>
HEC-RAS	Hydrologic Engineering Center - River Analysis System (<i>software program</i>)
LOTB	Log of Test Borings
NFIP	National Flood Insurance Program (FEMA)
NGVD29	National Geodetic Vertical Datum of 1929
P.I.	Preliminary Investigations
RC	Reinforced Concrete
RCB	Reinforced Concrete Box (culvert)
RR	Railroad
SBR	Supplementary Bridge Report
SIR	Scientific Investigations Report (USGS)
USACE	United States Army Corps of Engineers
U/S	upstream
USGS	United States Geological Survey
WMS	Watershed Modeling System (<i>software program</i>)
WSEL	Water Surface Elevation

REFERENCES

- 1) California Department of Transportation (Caltrans) - Bridge Inspection Reports (BIR's), Supplemental Bridge Reports (SBR's), Bridge File, Hydraulic Bridge File, As-Built Plan Sheets, Bridge Site Photos, (Caltrans) Digital Highway Inventory Photography Program (DHIPP) - aerial photos, proposed Bridge Plans - General Plan Sheet (*dated 8/18/14*)
- 2) Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS)
Plumas County, California and Incorporated Areas
Flood Insurance Study Number: 06063CV000A
(*Effective Date: March 2, 2005*)
- 3) Federal Emergency Management Agency (FEMA)
National Flood Insurance Program (NFIP), Flood Insurance Rate Map (FIRM)
Plumas County, California and Incorporated Areas
Map Number: 06063C0950E (Panel 950 of 1650)
(*Effective Date: March 2, 2005*)
- 4) USGS Scientific Investigations Report (SIR) 2012-5113
(Prepared in cooperation with the Federal Emergency Management Agency)
"Methods for Determining Magnitude and Frequency of Floods in California, Based on Data through Water Year 2006"
- 5) HEC-18, *"Evaluating Scour at Bridges"* (5th Edition, April 2012)
- 6) HEC-RAS Hydraulic Reference Manual (Version 4.1.0, January 2010)
US Army Corps of Engineers, Hydraulic Engineering Center
- 7) Additional References:
 - USGS StreamStats - online tool (*Software Program*)
<http://water.usgs.gov/osw/streamstats/california.html>
 - Google Earth (Version 7.1) (*Software Program*)
 - Google (web search engine) <http://www.google.com/>
 - Google Maps <https://www.google.com/maps/>
 - Bing Maps <http://www.bing.com/maps/>

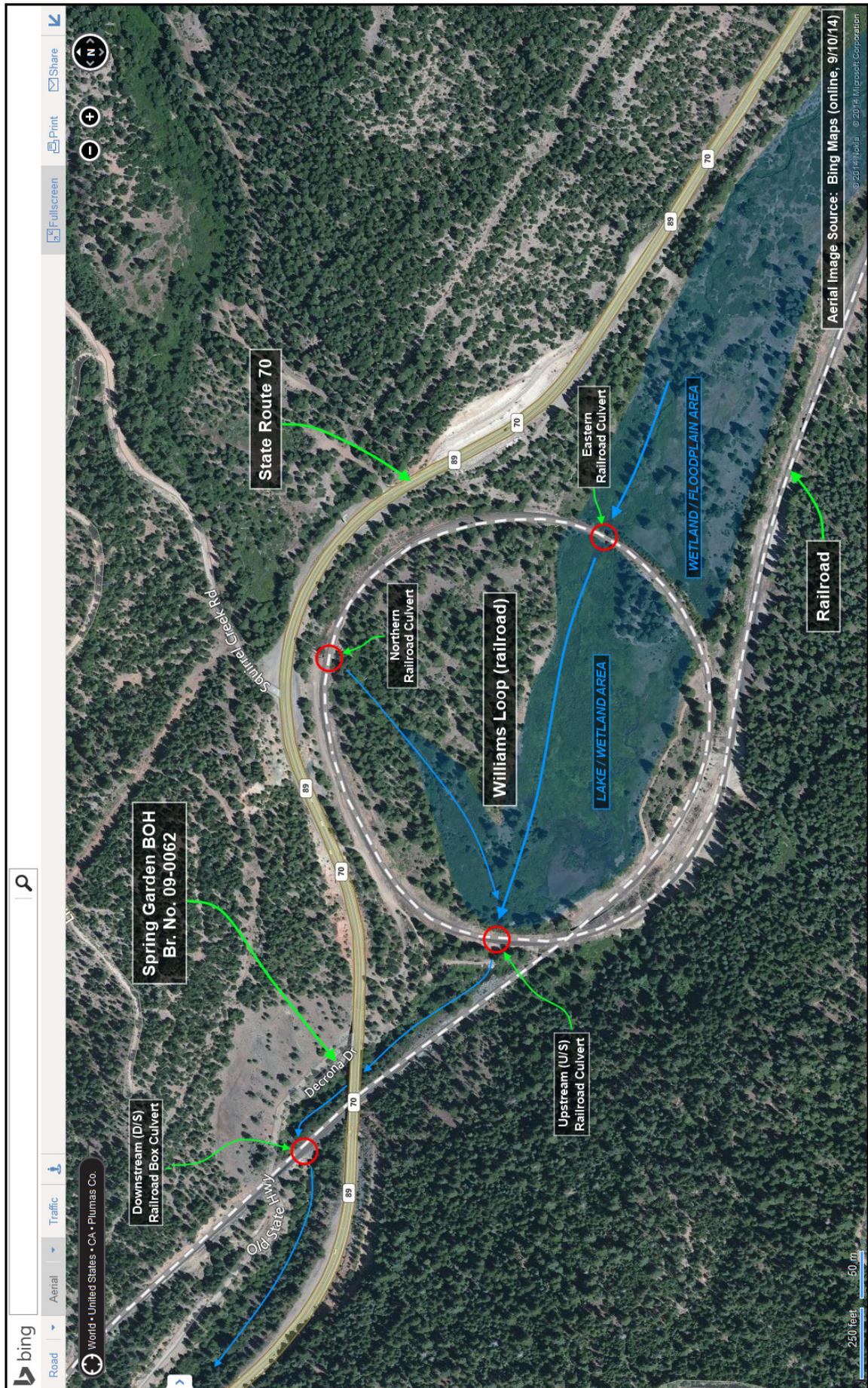


FIGURE 1 - Location Map of Spring Garden BOH, Br. No. 09-0062

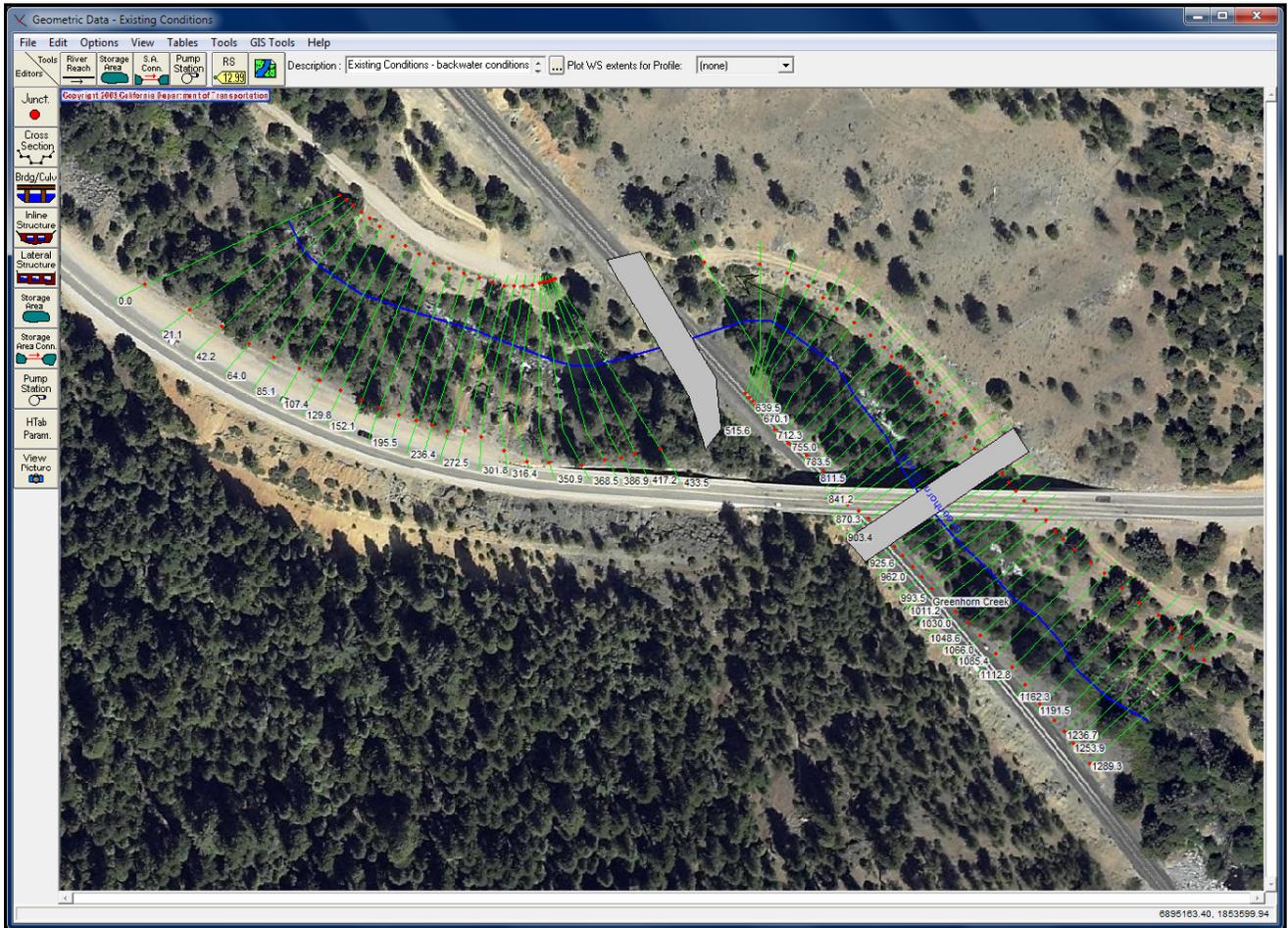


FIGURE 2 - Schematic Diagram of Hydraulic Model

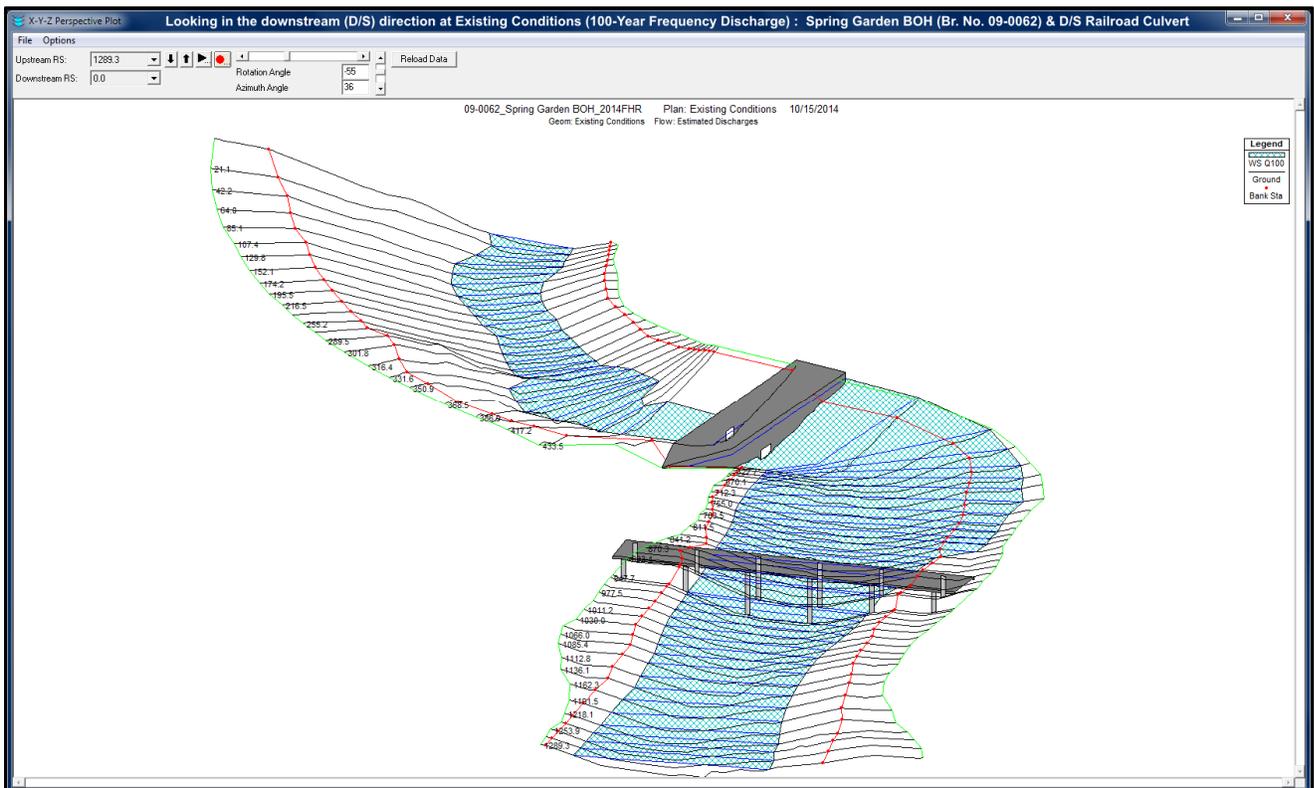


FIGURE 3 - XYZ Perspective Plot of Hydraulic Model

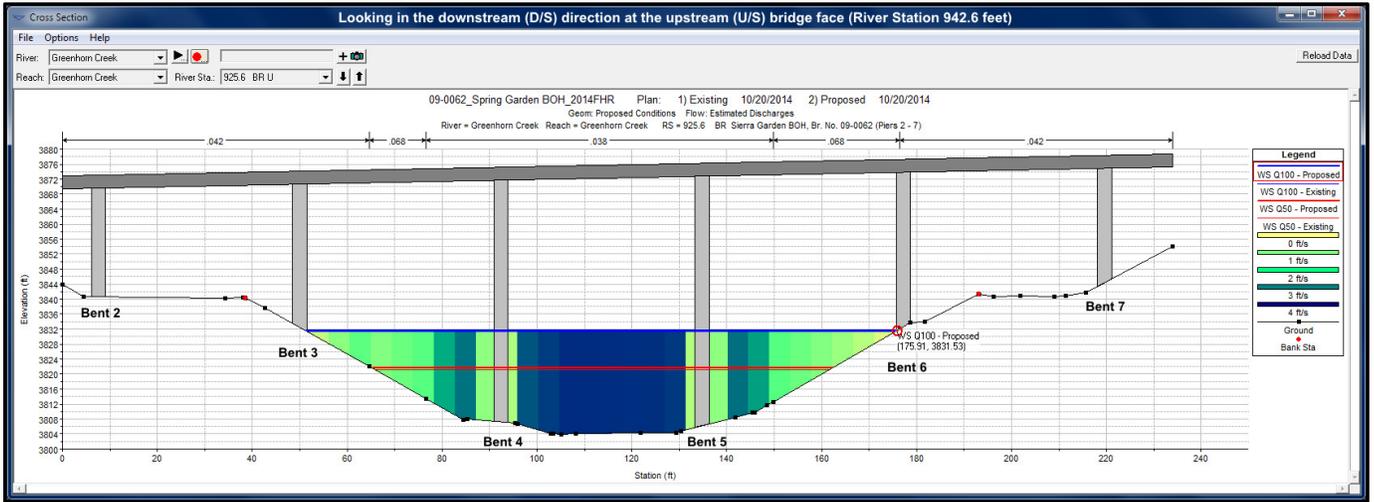


FIGURE 4A - Cross-Section at U/S Bridge Face (River Station 942.6 feet)

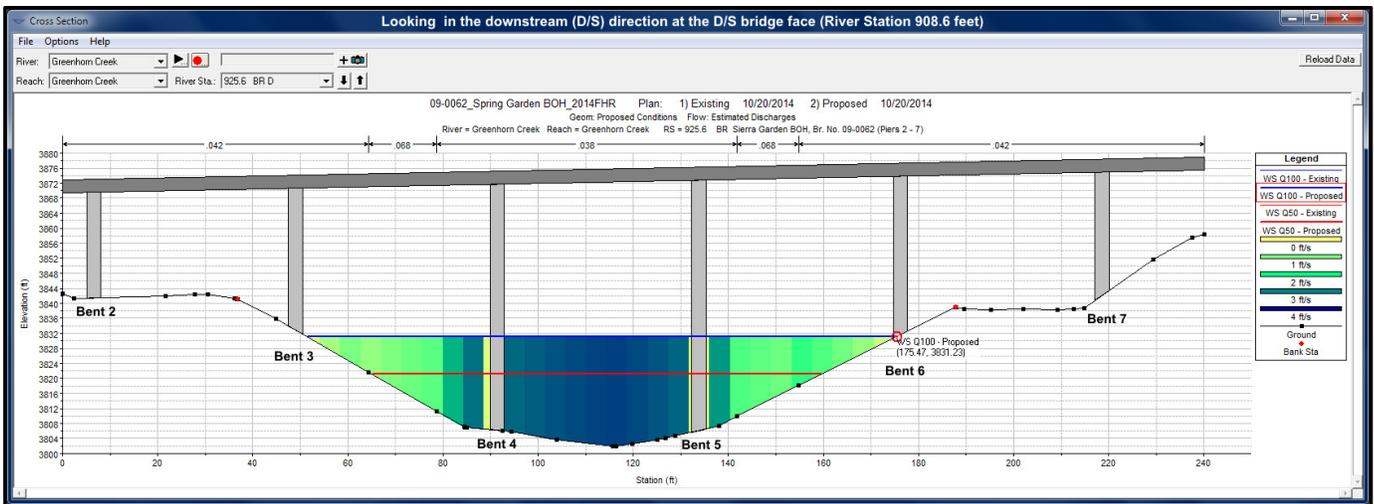


FIGURE 4B - Cross-Section at D/S Bridge Face (River Station 908.6 feet)

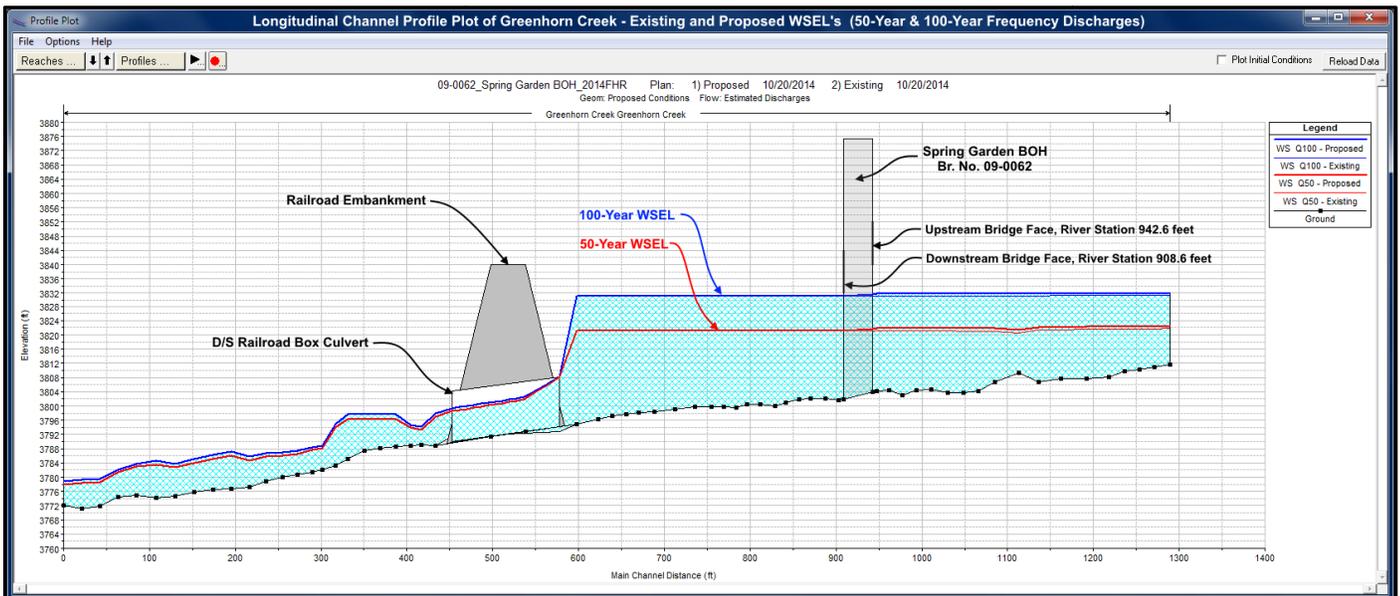


FIGURE 5- WSEL Profile Plot of Greenhorn Creek (Existing & Proposed)

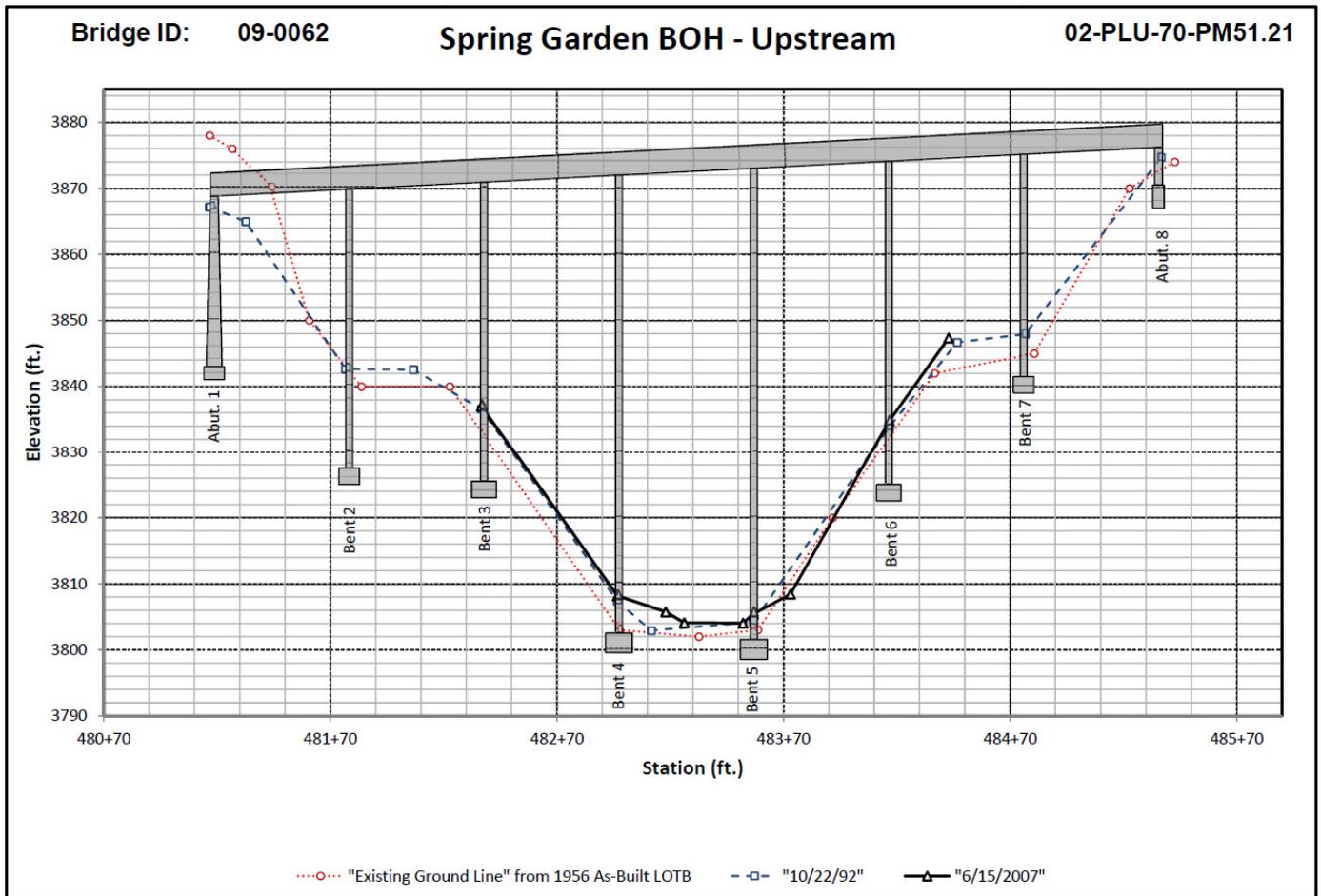


FIGURE 6 - Historical Channel Cross-Section (Profile) Plot

For Contract No. 02-2C0904

MATERIALS INFORMATION

Asbestos and Lead-Containing Paint Survey Report

**ASBESTOS AND LEAD-CONTAINING
PAINT SURVEY REPORT**

**Spring Garden Bridge and Overhead
Bridge No. 09-0062
02-PLU-70 Post Mile 51.29
Plumas County, California**

PREPARED FOR:

**CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 3
703 B STREET, P.O. BOX 911
MARYSVILLE, CALIFORNIA 95901**



PREPARED BY:

**GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DRIVE, SUITE 800
RANCHO CORDOVA, CALIFORNIA 95742**



**GEOCON PROJECT NO. S9805-01-65
TASK ORDER NO. 65
E-FIS 02-0000-0161-1 (EA 02-2C0901)
CONTRACT NO. 03A2132**

NOVEMBER 2015



Project No. S9805-01-65
November 25, 2015

Mark Melani, Task Order Manager
Caltrans District 3
703 B Street
Marysville, California 95901

Subject: ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT
02-PLU-70, PM 51.29, SPRING GARDEN BRIDGE AND OVERHEAD (09-0062)
PLUMAS COUNTY, CALIFORNIA
CONTRACT NO. 03A2132, E-FIS 02-0000-0161-1, EA 02-2C0901
TASK ORDER NO. 65

Dear Mr. Melani:

In accordance with California Department of Transportation Contract No. 03A2132 and Task Order No. 65, we have performed an asbestos and lead-containing paint survey of the Spring Garden Bridge and Overhead in Plumas County, California. Our scope of services included surveying the structure for suspect asbestos-containing materials and lead-containing paint, collecting bulk samples, and submitting the samples to laboratories for analyses.

The accompanying report summarizes the services performed and laboratory analysis.

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

Please contact us if you have questions concerning the contents of this report or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.

David A. Watts, CAC No. 98-2404
Senior Project Scientist

John E. Juhrend, PE, CEG
Senior Engineer

(4 + 4 CDs) Addressee

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2. Site Plan

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- A. Analytical Laboratory Reports and Chain-of-custody Documentation
-

ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT

1.0 INTRODUCTION

This asbestos and lead-containing paint (LCP) survey report was prepared by Geocon Consultants, Inc. under Caltrans Contract No. 03A2132, Task Order No. 65 (TO-65).

1.1 Project Description

The project consists of the Spring Garden Bridge and Overhead (09-0062) at Post Mile (PM) 51.29 on Highway 70 in Plumas County, California. We performed asbestos and LCP survey activities at the project location. The project location is depicted on the Vicinity Map, Figure 1, and Site Plan, Figure 2.

1.2 General Objectives

The purpose of the scope of services outlined in TO-65 was to determine the presence and quantity of asbestos and LCP at the project location prior to bridge rehabilitation activities. The information obtained from this investigation will be used by Caltrans for waste profiling, determining California Occupational Safety and Health Administration (Cal/OSHA) applicability, and coordinating asbestos and LCP disturbance activities.

It was not Geocon's intent during this inspection to conduct an evaluation of lead-based paint hazards in accordance with U.S. Department of Housing and Urban Development (HUD) guidelines.

2.0 BACKGROUND

2.1 Asbestos

The Code of Federal Regulations (CFR), 40 CFR 61, Subpart M, National Emissions Standards for Hazardous Air Pollutants (NESHAP) and Federal Occupational Safety and Health Administration (FED OSHA) classify asbestos-containing material (ACM) as any material or product that contains *greater than* 1% asbestos. Nonfriable ACM is classified by NESHAP as either Category I or Category II material defined as follows:

- **Category I** – asbestos-containing packings, gaskets, resilient floor coverings, and asphalt roofing products.
- **Category II** – all remaining types of nonfriable asbestos-containing material not included in Category I that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Regulated asbestos-containing material (RACM), a California hazardous waste when friable, is classified as any manufactured material that contains *greater than* 1% asbestos by dry weight *and* is:

- Friable (can be crumbled, pulverized, or reduced to powder by hand pressure); or
- Category I material that has become friable; or
- Category I material that has been subjected to sanding, grinding, cutting, or abrading; or
- Category II nonfriable material that has a high probability of becoming crumbled, pulverized, or reduced to a powder during demolition or renovation activities.

Activities that disturb materials containing *any* amount of asbestos are subject to certain requirements of the Cal/OSHA asbestos standard contained in Title 8 of the California Code of Regulations (CCR) §1529. Typically, removal or disturbance of more than 100 square feet of material containing more than 0.1% asbestos must be performed by a registered asbestos abatement contractor, but associated waste labeling is not required if the material contains 1% or less asbestos. When the asbestos content of a material exceeds 1%, virtually all requirements of the standard become effective.

Materials containing more than 1% asbestos are also subject to NESHAP regulations (40 CFR Part 61, Subpart M). RACM (friable ACM and nonfriable ACM that will become friable during demolition operations) must be removed from structures prior to demolition. Certain nonfriable ACM and materials containing 1% or less asbestos may remain in structures during demolition; however, there are waste handling/disposal issues and Cal/OSHA work requirements that must be addressed. Contractors are responsible for segregating and characterizing waste streams prior to disposal.

With respect to potential worker exposure, notification, and registration requirements, Cal/OSHA defines asbestos-containing construction material (ACCM) as construction material that contains more than 0.1% asbestos (Title 8, CCR 341.6).

2.2 Lead Paint

Construction activities (including demolition) that disturb materials or paints containing *any* amount of lead are subject to certain requirements of the Cal/OSHA lead standard contained in Title 8, CCR, §1532.1. Deteriorated paint is defined by Title 17, CCR, Division 1, Chapter 8, §35022 as a surface coating that is cracking, chalking, flaking, chipping, peeling, non-intact, failed, or otherwise separating from a substrate. Demolition of a deteriorated LCP component would require waste characterization and appropriate disposal. Intact LCP on a component is currently accepted by most landfills and recycling facilities; however, contractors are responsible for segregating and characterizing waste streams prior to disposal.

For a solid waste containing lead, the waste is classified as California hazardous when: 1) the representative total lead content equals or exceeds the respective Total Threshold Limit

Concentration (TTLC) of 1,000 milligrams per kilogram (mg/kg); or 2) the representative soluble lead content equals or exceeds the respective Soluble Threshold Limit Concentration (STLC) of 5 milligrams per liter (mg/l) based on the standard Waste Extraction Test (WET). A waste has the potential for exceeding the lead STLC when the waste's total lead content is greater than or equal to ten times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when total lead is detected at a concentration greater than or equal to 50 mg/kg, and assuming that 100 percent of the total lead is soluble, soluble lead analysis is required. Lead-containing waste is classified as "Resource, Conservation, and Recovery Act" (RCRA) hazardous, or Federal hazardous, when the representative soluble lead content equals or exceeds the Federal regulatory level of 5 mg/l based on the Toxicity Characteristic Leaching Procedure (TCLP).

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability; however, for the purposes of this investigation, toxicity (i.e., lead concentration) is the primary factor considered for waste classification since waste generated during the construction activities would not likely warrant testing for ignitability or other criteria. Waste that is classified as either California-hazardous or RCRA-hazardous requires management as a hazardous waste.

Potential hazards exist to workers who remove or cut through LCP coatings during demolition. Dust containing hazardous concentrations of lead may be generated during scraping or cutting materials coated with lead-containing paint. Torching of these materials may produce lead oxide fumes. Therefore, air monitoring and/or respiratory protection may be required during the demolition of materials coated with LCP. Guidelines regarding regulatory provisions for construction work where workers may be exposed to lead are presented in Title 8, CCR, §1532.1.

2.3 Architectural Drawings and Previous Survey Activities

We reviewed structure architectural plans provided by Caltrans prior to field activities. We did not identify specifications or notes regarding the use of asbestos-containing materials or lead paint in the architectural plans provided. Previous asbestos survey reports were not available for our review.

3.0 SCOPE OF SERVICES

Mr. David Watts, a California-Certified Asbestos Consultant (CAC), certification No. 98-2404 (expiration September 16, 2016), and Certified Lead Paint Inspector/Assessor and Project Monitor with the California Department of Public Health (DPH), certification numbers I-1734 and M-1734 (expiration December 4, 2016), performed the asbestos and LCP survey at the project location on November 4, 2015.

3.1 Asbestos

Suspect ACM were grouped into homogeneous areas with representative samples randomly collected from each. In addition, each potential ACM was evaluated for friability. A total of seven bulk asbestos samples representing three suspect materials were collected.

Our procedures for inspection and sampling in accordance with TO-65 are discussed below:

- Collected bulk asbestos samples after first wetting friable materials with a light mist of water. The samples were then cut from the substrate and transferred to labeled containers. Note that when multiple samples were collected, the sampling locations were distributed throughout the homogeneous area (spaces where the material was observed).
- Relinquished bulk asbestos samples under standard chain-of-custody protocol to EMSL Analytical, Inc., a California-licensed and Caltrans-approved subcontractor, for asbestos analysis in accordance with United States Environmental Protection Agency (EPA) Test Method 600/R-93/116 using polarized light microscopy (PLM). EMSL Analytical, Inc. is a laboratory accredited by the National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program (NIST-NVLAP) for bulk asbestos fiber analysis. The laboratory analyses were requested on a turnaround period of five days.

Sample group identification numbers, material descriptions, approximate quantities, friability assessments, and photo references are summarized on Table 1. Approximate sample locations are presented on Figure 2. Materials represented by the samples collected are shown in the attached photographs.

3.2 Lead Paint

A total of six bulk paint samples representing were collected from suspect LCP observed at the project location. Mr. Watts field-composited the suspect LCP samples into three paint schemes prior to submittal to the laboratory. We did not observe deteriorated LCP during our survey. Our sampling procedures in accordance with TO-65 are discussed below:

- Collected bulk samples of suspect LCP using techniques presented in HUD guidelines. In addition, the painted areas were evaluated for evidence of deterioration such as flaking or cracking.
- Relinquished bulk LCP samples under standard chain-of-custody protocol to Advanced Technology Laboratories, a California-licensed and Caltrans-approved subcontractor, for total and soluble lead analysis in accordance with EPA Test Method 6010B. Advanced Technology Laboratories is accredited by the DPH for lead analysis. The laboratory analyses were requested on a turnaround period of five days.

Paint sample identification numbers, descriptions, peeling and flaking quantities, and photo references are summarized on Table 2. Approximate sample locations are presented on Figure 2. Materials represented by the samples collected are shown in the attached photographs.

4.0 INVESTIGATIVE RESULTS

4.1 Asbestos Analytical Results

Asbestos was not detected in samples of the suspect materials collected during our survey. A summary of the analytical laboratory test results for asbestos is presented on Table 1. Reproductions of the laboratory report and chain-of-custody documentation are presented in Appendix A.

4.2 Paint Analytical Results

Representative total lead was not detected at or above the laboratory reporting limit (RL) of 4.0 mg/kg in our sample representing intact yellow traffic striping.

Our sample representing intact white traffic striping exhibited a representative total lead concentration of 4.2 mg/kg.

Our sample representing intact green paint applied to steel structural members of the bridge exhibited a representative total lead concentration of 14,000 mg/kg and a representative TCLP lead concentration of 82 mg/l.

A summary of the analytical laboratory test results for paint is presented on Table 2. Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix A.

5.0 RECOMMENDATIONS

Based on our findings, we recommend the following:

5.1 Asbestos

Since no asbestos was detected in the samples collected during our survey, the Cal/OSHA asbestos standard does not apply for planned activities. In addition, debris would not be considered a California hazardous waste based on asbestos content. Written notification to the U.S. EPA Region IX and the California Air Resources Board is required ten working days prior to commencement of *any* demolition activity (whether asbestos is present or not).

5.2 Lead Paint

Green paint applied to steel structural members of the bridge would be classified as California and Federal hazardous based on lead content, if stripped, blasted, or otherwise separated from the substrate. Activities disturbing 100 square feet or more of the paint would require a Cal/OSHA lead notification.

Yellow and white traffic striping sampled during our survey would not be classified as California or Federal hazardous waste based on lead content.

We recommend that all paints at the project location be treated as lead-containing for purpose of determining the applicability of the Cal/OSHA lead standard during maintenance, renovation, and demolition activities. This recommendation is based on LCP sample results and the fact that lead was a common ingredient of paints manufactured before 1978 and is still an ingredient of some paints. In accordance with Title 8, CCR, §1532.1(p), written notification to the nearest Cal/OSHA district office is required at least 24 hours prior to certain lead-related work. Compliance and training requirements regarding construction activities where workers may be exposed to lead are presented in Title 8, CCR, §1532.1, subsections (e) and (l), respectively.

The removal, transportation, placement, handling, and disposal of LCP must result in no visible dust.

6.0 REPORT LIMITATIONS

The asbestos and LCP survey was conducted in conformance with generally accepted standards of practice for identifying and evaluating asbestos and LCP in structures. The survey addressed only the structure identified in Section 1.1. Due to the nature of structure surveys, asbestos and LCP use, and laboratory analytical limitations, some ACM or LCP at the project location may not have been identified. Spaces such as cavities, voids, crawlspaces, and pipe chases may have been concealed to our investigator. Previous renovation work may have concealed or covered spaces or materials or may have partially demolished materials and left debris in inaccessible areas. Additionally, renovation activities may have partially replaced ACM with indistinguishable non-ACM. Asbestos and/or LCP may exist in areas of the structure that were not accessible or sampled in conjunction with this TO.

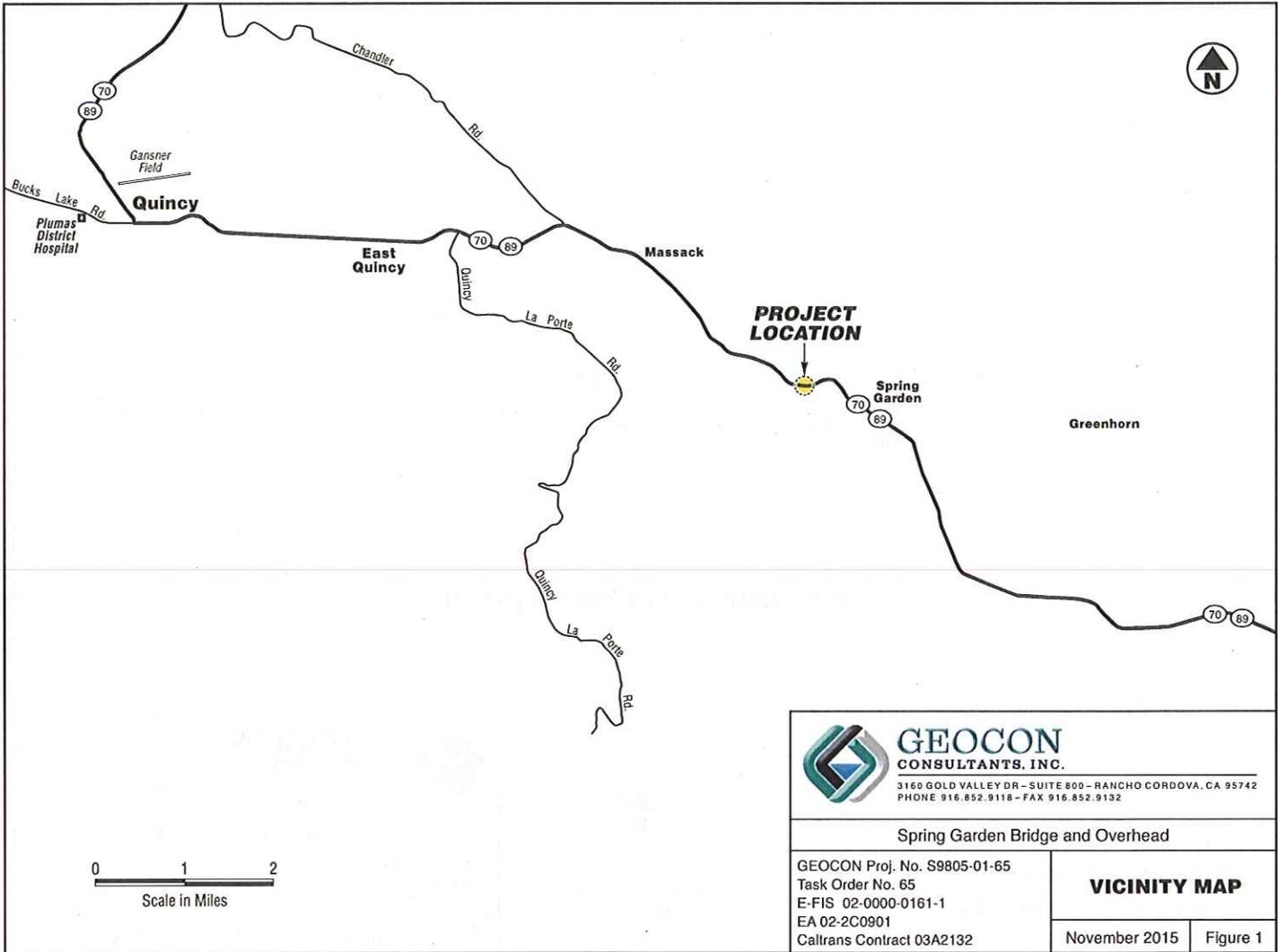
During renovation or demolition operations, suspect materials may be uncovered which are different from those accessible for sampling during this assessment. Personnel in charge of renovation/demolition should be alerted to note materials uncovered during such activities that differ substantially from those included in this or previous assessment reports. If suspect ACM and/or LCP are found, additional sampling and analysis should be performed to determine if the materials contain asbestos or lead.

This report has been prepared exclusively for Caltrans. The information contained herein is only valid as of the date of the report and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and

laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. Geocon strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

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



GEOCON
CONSULTANTS, INC.

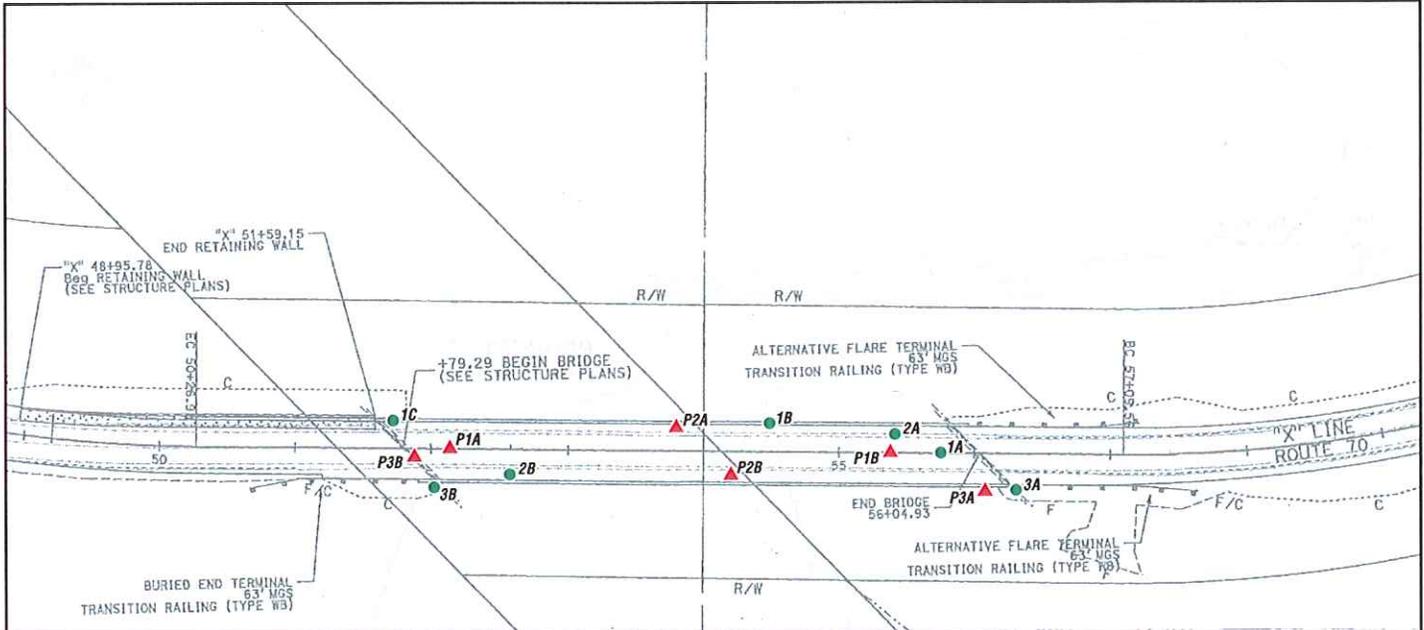
3160 GOLD VALLEY DR - SUITE 800 - RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 - FAX 916.852.9132

Spring Garden Bridge and Overhead

GEOCON Proj. No. S9805-01-65
Task Order No. 65
E-FIS 02-0000-0161-1
EA 02-2C0901
Caltrans Contract 03A2132

VICINITY MAP

November 2015 | Figure 1



SPRING GARDEN BRIDGE AND OVERHEAD (09-0062)

LEGEND:

- Approximate Asbestos Sample Location
- ▲ Approximate Paint Sample Location



GEOCON
CONSULTANTS, INC.

3160 GOLD VALLEY DR - SUITE 600 - RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 - FAX 916.852.9132

Spring Garden Bridge and Overhead

GEOCON Proj. No. S9805-01-65
Task Order No. 65
E-FIS 02-0000-0161-1
EA 02-2C0901
Caltrans Contract 03A2132

SITE PLAN

November 2015 | Figure 2



Photo 1 – Spring Garden Bridge and Overhead at PM 51.29 on Highway 70 in Plumas County, California



Photo 2 – Bridge abutment and bearings



Photo 3 – Bridge deck



Photo 4 – Steel conduit



Photo 5 – Steel drainpipe



Photo 6 – Elastomeric (non-suspect) deck joint seal

TABLE 1
SUMMARY OF ASBESTOS ANALYTICAL RESULTS
CONTRACT 03A2132, TASK ORDER NO. 65, E-FIS 02-0000-0161-1 (EA 02-2C0901)
SPRING GARDEN BRIDGE AND OVERHEAD (09-0062)
PLUMAS COUNTY, CALIFORNIA

Polarized Light Microscopy (PLM) - EPA Test Method 600/R-93/116

Sample Group No.	Description of Material	Approximate Quantity	Friable	Site Photo	Asbestos Content
1	Concrete	NA	NA	1 through 6	ND
2	Asphalt	NA	NA	3 and 6	ND
3	Joint fill material	NA	NA	2	ND

Notes:

NA = Not applicable (no asbestos detected)
ND = Not detected

TABLE 2
SUMMARY OF PAINT ANALYTICAL RESULTS - TOTAL AND SOLUBLE LEAD
CONTRACT 03A2132, TASK ORDER NO. 65, E-FIS 02-0000-0161-1 (EA 02-2C0901)
SPRING GARDEN BRIDGE AND OVERHEAD (09-0062)
PLUMAS COUNTY, CALIFORNIA

Sample No.	Paint Description	Approximate Quantity Peeling/Flaking	Site Photos	Total Lead (mg/kg)	TCLP Lead (mg/l)
P1A/B	Yellow traffic striping	Intact	3 and 6	<4.0	---
P2A/B	White traffic striping	Intact	3 and 6	4.2	---
P3A/B	Green (steel members)	Intact	1, 2, 4, and 5	14,000	82

Notes:

mg/kg = milligrams per kilogram

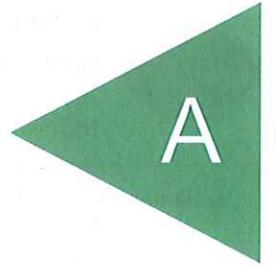
TCLP = Toxicity Characteristic Leaching Procedure

mg/l = milligrams per liter

< = not detected at or above the indicated laboratory reporting limit

--- = not analyzed

APPENDIX



A



EMSL Analytical, Inc.

464 McCormick Street San Leandro, CA 94577
Tel/Fax: (510) 895-3675 / (510) 895-3680
<http://www.EMSL.com> / sanleandrolab@emsl.com

EMSL Order: 091518846
Customer ID: GECN21
Customer PO:
Project ID: 03A2132

Attention: Dave Watts
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Project: SPRING GARDEN (03A2132)

Phone: (925) 785-5340
Fax: (925) 371-5915
Received Date: 11/ 6/2015 8:00 AM
Analysis Date: 11/17/2015
Collected Date: 11/ 4/2015

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
1A <i>091518846-0001</i>	CONCRETE	Gray Non-Fibrous Homogeneous		40% Quartz 30% Ca Carbonate 30% Non-fibrous (Other)	None Detected
1B <i>091518846-0002</i>	CONCRETE	Gray Non-Fibrous Homogeneous		40% Quartz 30% Ca Carbonate 30% Non-fibrous (Other)	None Detected
1C <i>091518846-0003</i>	CONCRETE	Gray Non-Fibrous Homogeneous		40% Quartz 30% Ca Carbonate 30% Non-fibrous (Other)	None Detected
2A <i>091518846-0004</i>	ASPHALT	Black Non-Fibrous Homogeneous		40% Quartz 20% Ca Carbonate 30% Matrix 10% Non-fibrous (Other)	None Detected
2B <i>091518846-0005</i>	ASPHALT	Black Non-Fibrous Homogeneous		40% Quartz 20% Ca Carbonate 30% Matrix 10% Non-fibrous (Other)	None Detected
3A <i>091518846-0006</i>	JOINT FILL MASTIC	Brown Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
3B <i>091518846-0007</i>	JOINT FILL MASTIC	Brown Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected

Analyst(s)
Matthew Batongbacal (7)

Chris Dojlidko, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial Report From: 11/17/2015 11:16:26



Asbestos Chain of Custody
EMSL Order Number (Lab Use Only).

091518846
03A 2132

EMSL ANALYTICAL, INC
 2235 POLVOROSA DR #230
 SAN LEANDRO, CA 94577
 PHONE: (510) 895-3675
 FAX: (510) 895-3680

Company: GEOCON		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 6671 BRISA ST		Third Party Billing requires written authorization from third party	
City: LIVERMORE	State/Province: CA	Zip/Postal Code: 94550	Country: USA
Report To (Name): D. WATTS		Telephone #: 925-371-5900	
Email Address: WATTS@GEOCONINC.COM		Fax #: 925-371-5915	Purchase Order: 03A2132
Project Name/Number: SPRING GARDEN		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email	
U.S. State Samples Taken: CA 39805-01-65		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air <input type="checkbox"/> Check if samples are from NY <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA	TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312	TEM - Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167)
PLM - Bulk (reporting limit) <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5	Soil/Rock/Vermiculite <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> TEM Qual. via Filtration Technique <input type="checkbox"/> TEM Qual. via Drop-Mount Technique
TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking		Other: <input type="checkbox"/>

Check For Positive Stop - Clearly Identify Homogenous Group Filter Pore Size (Air Samples): 0.8µm 0.45µm

Samplers Name: **D. WATTS** Samplers Signature: *[Signature]*

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
1A-C	CONCRETE	NA	4/10/15
2A/B	ASPHALT	↓	↓
3A/B	JOINT FILL MAT'L	↓	↓

Client Sample # (s): **1A-3B** Total # of Samples: **7**

Relinquished (Client): *[Signature]* Date: **11/4/15** Time: **1800**

Received (Lab): *[Signature]* Date: **11/6/15** Time: **8:00am**

Comments/Special Instructions: **(D/B)**



November 13, 2015

Dave Watts
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 961-5273
Fax: (925) 371-5915

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No.: T104704502

Re: ATL Work Order Number : 1503828
Client Reference : SPRING GARDEN, S9805-01-65

Enclosed are the results for sample(s) received on November 06, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', is written over a light blue horizontal line.

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.

3275 Walnut Avenue, Signal Hill, CA 90755 • Tel: 562-989-4045 • Fax: 562-989-4040
www.atlglobal.com



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SPRING GARDEN, S9805-01-65
Report To : Dave Watts
Reported : 11/13/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
P1A/B	1503828-01	Paint	11/04/15 0:00	11/06/15 7:57
P2A/B	1503828-02	Paint	11/04/15 0:00	11/06/15 7:57
P3A/B	1503828-03	Paint	11/04/15 0:00	11/06/15 7:57



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SPRING GARDEN, S9805-01-65
Report To : Dave Watts
Reported : 11/13/2015

Total Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1503828-01	P1A/B	ND	mg/kg	4.0	1	B5K0302	11/11/2015	11/12/15 10:21	
1503828-02	P2A/B	4.2	mg/kg	4.0	1	B5K0302	11/11/2015	11/12/15 10:25	
1503828-03	P3A/B	14000	mg/kg	100	50	B5K0302	11/11/2015	11/12/15 10:17	D6



Certificate of Analysis

Geocon Consultants, Inc.
 6671 Brisa Street
 Livermore, CA 94550

Project Number : SPRING GARDEN, S9805-01-65
 Report To : Dave Watts
 Reported : 11/13/2015

QUALITY CONTROL SECTION

Total Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD RPD	RPD Limit	Notes
Batch B5K0302 - EPA 3050B_S									
Blank (B5K0302-BLK1)					Prepared: 11/11/2015 Analyzed: 11/12/2015				
Lead	ND	1.0			NR				
LCS (B5K0302-BS1)					Prepared: 11/11/2015 Analyzed: 11/12/2015				
Lead	48.5274	1.0	50.0000		97.1	80 - 120			
LCS Dup (B5K0302-BSD1)					Prepared: 11/11/2015 Analyzed: 11/12/2015				
Lead	49.5459	1.0	50.0000		99.1	80 - 120	2.08	20	
Duplicate (B5K0302-DUP1)					Prepared: 11/11/2015 Analyzed: 11/12/2015				
		Source: 1503828-03							
Lead	16876.6	100		14435.8	NR		15.6	20	D6



Certificate of Analysis

Geocon Consultants, Inc.

6671 Brisa Street

Livermore, CA 94550

Project Number : SPRING GARDEN, S9805-01-65

Report To : Dave Watts

Reported : 11/13/2015

Notes and Definitions

D6	Sample required dilution due to high concentration of target analyte.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
- (3) Results are wet unless otherwise specified.

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY:

Advanced Technology Laboratories
 3275 Walnut Avenue
 Signal Hill, CA 90755
 (562) 989-4045 • Fax: (562) 989-4040

P.O.#: 03A2132
 Logged By: _____ Date: _____

Method of Transport: Client ATL CA OverN FEDEX Other: _____

Sample Condition Upon Receipt:
 1. CHILLED Y N 4. SEALED Y N
 2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
 3. CONTAINER INTACT Y N 6. PRESERVED Y N

Client: **GEOCON CONSULTANTS, INC.**
 Address: 6671 Brisa Street
 City: Livemore State: CA Zip Code: 94550
 TEL: (925) 371-5900 FAX: (925) 371-5915

Project Name: SPRING GARDEN Project #: 9805-01-65 Sampler: D. WATTS
 Relinquished by: (Signature and Printed Name) [Signature] Date: 11/4/15 Time: 1800
 Relinquished by: (Signature and Printed Name) [Signature] Date: 11/6/15 Time: 07:50
 Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____

Bill To: _____
 Alt#: _____
 Co: SAME AS ABOVE
 Address: _____
 City: _____ State: _____ Zip: _____

Send Report To: _____
 Alt#: _____
 Co: SAME AS ABOVE
 Address: _____
 City: _____ State: _____ Zip: _____

Special Instructions/Comments:
Anticipate Soluble Requests (PAINT)

Sample/Records - Archival & Disposal
 Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
 • Sample : \$2.00 / sample / mo (after 45 days)
 • Records : \$1.00 / ATL workorder / mo (after 1 year)

LAB USE ONLY: Batch #	Sample Description	Sample I.D. / Location	Date	Time	SPECIFY APPROPRIATE MATRIX		PRESERVATION	QA/QC
					Container(s)	Type		
1503828-01	P1A/B	P1A/B	11/4/15	VAR	PAINT	WASTEWATER	X	RTNE <input type="checkbox"/> CT <input checked="" type="checkbox"/> SWRCB <input type="checkbox"/> Logcode <input type="checkbox"/> OTHER _____
1	P2A/B	P2A/B	↓	↓	PAINT	GROUND WATER	↑	REMARKS: <u>WTS</u>
7	P3A/B	P3A/B	↓	↓	PAINT	WATER	↑	REMARKS: <u>WTS</u>
								REMARKS: <u>SHL</u>

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday
 C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays
 Container Types: T=Tube V=VOA L=Liter P=Pin J=Jar B=Tealjar G=Glass P=Plastic M=Metal
 Preservatives: H=Hcl N=HNO₃ S=H₂SO₄ C=4°C Z=Zn(AC) O=NaOH T=Na₂S₂O₃

DISTRIBUTION: White with report Yellow in folder Pink in submittal



November 20, 2015

Dave Watts
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 961-5273
Fax: (925) 371-5915

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1503828
Client Reference : SPRING GARDEN, S9805-01-65

Enclosed are the results for sample(s) received on November 06, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', is written over a light blue horizontal line.

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.

3275 Walnut Avenue, Signal Hill, CA 90755 • Tel: 562-989-4045 • Fax: 562-989-4040
www.atlglobal.com



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SPRING GARDEN, S9805-01-65
Report To : Dave Watts
Reported : 11/20/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
P3A/B	1503828-03	Paint	11/04/15 0:00	11/06/15 7:57



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SPRING GARDEN, S9805-01-65
Report To : Dave Watts
Reported : 11/20/2015

TCLP Metals by ICP-AES EPA 6010B Analyte: Lead Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1503828-03	P3A/B	82	mg/L	0.62	10	B5K0513	11/18/2015	11/19/15 09:48	D6



Certificate of Analysis

Geocon Consultants, Inc.
 6671 Brisa Street
 Livermore, CA 94550

Project Number : SPRING GARDEN, S9805-01-65

Report To : Dave Watts

Reported : 11/20/2015

QUALITY CONTROL SECTION

TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD RPD	RPD Limit	Notes
Batch B5K0513 - EPA 3010A_S									
Blank (B5K0513-BLK1)					Prepared: 11/18/2015 Analyzed: 11/18/2015				
Lead	ND	0.050			NR				
Blank (B5K0513-BLK2)					Prepared: 11/18/2015 Analyzed: 11/18/2015				
Lead	ND	0.050			NR				
LCS (B5K0513-BS1)					Prepared: 11/18/2015 Analyzed: 11/18/2015				
Lead	0.973002	0.050	1.00000		97.3	80 - 120			
Duplicate (B5K0513-DUP1)					Source: 1503885-07 Prepared: 11/18/2015 Analyzed: 11/18/2015				
Lead	4.25711	0.050		4.17784	NR		1.88	20	
Duplicate (B5K0513-DUP2)					Source: 1503747-52 Prepared: 11/18/2015 Analyzed: 11/18/2015				
Lead	0.047859	0.050		0.045159	NR		5.80	20	
Matrix Spike (B5K0513-MS1)					Source: 1503885-07 Prepared: 11/18/2015 Analyzed: 11/18/2015				
Lead	6.01919	0.050	2.50000	4.17784	73.7	77 - 121			M1
Matrix Spike (B5K0513-MS2)					Source: 1503747-52 Prepared: 11/18/2015 Analyzed: 11/18/2015				
Lead	2.23474	0.050	2.50000	0.045159	87.6	77 - 121			
Matrix Spike Dup (B5K0513-MSD1)					Source: 1503885-07 Prepared: 11/18/2015 Analyzed: 11/18/2015				
Lead	6.08652	0.050	2.50000	4.17784	76.3	77 - 121	1.11	20	M1



Certificate of Analysis

Geocon Consultants, Inc.

Project Number : SPRING GARDEN, S9805-01-65

6671 Brisa Street

Report To : Dave Watts

Livermore , CA 94550

Reported : 11/20/2015

Notes and Definitions

M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
D6	Sample required dilution due to high concentration of target analyte.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
- (3) Results are wet unless otherwise specified.

Diane Galvan

From: Dave Watts, CAC [watts@geoconinc.com]
Sent: Friday, November 13, 2015 3:43 PM
To: Diane Galvan
Cc: Luann Beadle
Subject: Re: Results/EDD/Invoice - SPRING GARDEN (1503828)
Attachments: image001.jpg

Tclp p3. Same tat. Thx.

David Watts, Geocon
925-785-5340
watts@geoconinc.com
Sent from my iPhone

For Contract No. 02-2C0904

MATERIALS INFORMATION

Aerially Deposited Lead and Naturally Occurring Asbestos Site Investigation Report

AERIALLY DEPOSITED LEAD AND NATURALLY OCCURRING ASBESTOS SITE INVESTIGATION REPORT

State Route 70 (02-PLU-70)
Post Miles 50.3 to 53.0
Plumas County, California

PREPARED FOR:

**CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 3
703 B STREET, P.O. BOX 911
MARYSVILLE, CALIFORNIA 95901**



PREPARED BY:

**GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DRIVE, SUITE 800
RANCHO CORDOVA, CALIFORNIA 95742**



**GEOCON PROJECT NO. S9805-01-65
TASK ORDER NO. 65
E-FIS 02-0000-0161-1 (EA 02-2C0901)
CONTRACT NO. 03A2132**

DECEMBER 2015



Project No. S9805-01-65
December 30, 2015

Mark Melani, Task Order Manager
Caltrans District 3
703 B Street
Marysville, California 95901

Subject: AERIALY DEPOSITED LEAD AND NATURALLY OCCURRING ASBESTOS
SITE INVESTIGATION REPORT
STATE ROUTE 70 (02-PLU-70), POST MILE 50.3 to 53.0
PLUMAS COUNTY, CALIFORNIA
CONTRACT NO. 03A2132, E-FIS 02-0000-0161-1, EA 02-2C0901
TASK ORDER NO. 65

Dear Mr. Melani:

In accordance with California Department of Transportation Contract No. 03A2132 and Task Order No. 65, we have performed environmental engineering services at the project site. The Site consists of State Route 70 at approximate Post Mile 50.3 to 53.0 in Plumas County, California. The accompanying report summarizes the services performed including the excavation of 19 hand-auger borings for the collection of soil samples for aerially deposited lead and/or naturally occurring asbestos analysis.

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

Please contact us if you have any questions concerning the contents of this report or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.

John C. Pfeiffer, PG, CEG
Senior Geologist



John E. Juhrend, PE, CEG
Senior Engineer

(2 + 2 CD) Addressee

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AERIALY DEPOSITED LEAD AND NATURALLY OCCURRING ASBESTOS SITE INVESTIGATION REPORT

1.0 INTRODUCTION

This Aerially Deposited Lead (ADL) and Naturally Occurring Asbestos (NOA) Site Investigation Report for State Route 70 (SR-70) Post Mile (PM) 50.3 to 53.0 was prepared by Geocon Consultants, Inc. under California Department of Transportation (Caltrans) Contract No. 03A2132, Task Order (TO) No. 65.

1.1 Project Description and Proposed Improvements

The project area consists of the unpaved shoulders unpaved shoulders and adjacent road embankment along SR-70 at the Spring Garden Bridge and Overhead (Bridge No. 09-0062), between PM 50.3 and 53.0 (the Site), approximately 6 miles east of the town of Quincy in Plumas County, California. The approximate project location is depicted on the attached Vicinity Map, Figure 1.

Caltrans proposes to rehabilitate and widen the existing Spring Garden Bridge and Overhead on SR-70. The project would include bridge rehabilitation and widening, road widening, paving, sign replacement, road striping, metal beam guardrail installation/replacement, retaining walls, grading and earthwork, relocation of ice warning system conduit and conductors, vegetation removal and tree clearing, and temporary placement of clean gravel fill in Greenhorn Creek. The Site is depicted on the attached Site Plan, Figure 2.

1.2 General Objectives

The proposed bridge rehabilitation and roadway improvement project will require the disturbance of soil at the Site and will generate excess soil. The purpose of the scope of services outlined in TO No. 65 was to evaluate the Site for potential impacts due to ADL from motor vehicle exhaust in the surface and near-surface soils and the presence of NOA derived from ultramafic rock within the project boundaries. The investigative results will be used by Caltrans to inform the construction contractor if ADL- and/or NOA-impacted soils are present within the project boundaries for construction worker health and safety, and soil management and disposal purposes.

2.0 BACKGROUND

Caltrans requested the site investigation to provide data regarding the potential presence of ADL and/or NOA within the proposed soil disturbance area.

Regulatory criteria to classify a waste as “California hazardous” for handling and disposal purposes are contained in the California Code of Regulations (CCR), Title 22, Division 4.5, Chapter 11, Article 3,

§ 66261.24. Criteria to classify a waste as “Resource, Conservation, and Recovery Act (RCRA) hazardous” are contained in Chapter 40 of the Code of Federal Regulations (40 CFR), § 261.

2.1 Potential Lead Soil Impacts

Ongoing testing by Caltrans has indicated that ADL exists along major freeway routes due to emissions from vehicles powered by leaded gasoline.

2.2 Hazardous Waste Determination Criteria

For waste containing metals, the waste is classified as California hazardous when: 1) the representative total metal content equals or exceeds the respective Total Threshold Limit Concentration (TTLC); or 2) the representative soluble metal content equals or exceeds the respective Soluble Threshold Limit Concentration (STLC) based on the standard Waste Extraction Test (WET). A waste may have the potential of exceeding the STLC when the waste’s total metal content is greater than or equal to ten times the respective STLC value, since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to ten times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is required. A material is classified as RCRA hazardous, or Federal hazardous, when the representative soluble metal content equals or exceeds the Federal regulatory level based on the Toxicity Characteristic Leaching Procedure (TCLP).

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability and corrosivity; however, for the purposes of this investigation, toxicity (i.e., representative lead concentrations) is the primary factor considered for waste classification since waste generated during the construction activities would not likely warrant testing for ignitability or corrosivity. Waste that is classified as either California-hazardous or RCRA-hazardous requires management as a hazardous waste.

The Department of Toxic Substances Control (DTSC) regulates and interprets hazardous waste laws in California. DTSC generally considers excavated or transported materials that exhibit “hazardous waste” characteristics to be a ‘waste’ requiring proper management, treatment and disposal. Soil that contains lead above hazardous waste thresholds and is left in-place would not be necessarily classified by DTSC as a ‘waste.’ The DTSC has provided site-specific determinations that “movement of wastes within an area of contamination does not constitute ‘land disposal’ and, thus, does not trigger hazardous waste disposal requirements.” Therefore, lead-impacted soil that is scarified in-place, moisture-conditioned, and recompacted during roadway improvement activities might not be considered a ‘waste.’ DTSC should be consulted to confirm waste classification. It is noted that in addition to DTSC regulations, health and safety requirements and other local agency requirements may also apply to the handling and disposal of lead-impacted soil.

2.3 Naturally Occurring Asbestos

The construction activities proposed by Caltrans may disturb NOA-containing soil and/or rock units, if present at the Site. The California Air Resources Board (CARB) has mitigation practices for construction, grading, quarrying and surface mining operations that may disturb natural occurrences of asbestos as outlined in CCR Title 17, § 93105. NOA potentially poses a health hazard when it becomes an airborne particulate. Mitigation practices can reduce the risk of exposure to asbestos-containing dust. The primary mitigation practice used for controlling exposure to potentially asbestos-containing dust is the implementation of engineering controls including wetting the materials being disturbed. If engineering controls do not adequately control exposure to potentially asbestos-containing dust, the use of personal protective equipment including wearing air purifying respirators with High Efficiency Particulate Air filters is required during construction activities. Dust control methods similar to those in CCR Title 17, § 93105 are outlined in CCR Title 17, § 93106 for airborne asbestos in road surfacing applications. Using surfacing material with 0.25% or more asbestos material is not permitted and wetting of the material or the application of a surface sealant is recommended to minimize disturbance of the asbestos material. Onsite reuse or disposal of NOA-containing materials is allowed by CCR Title 17, § 93106 and CCR Title 17, § 93105 if it is buried under at least 3 inches of material that does not contain NOA.

3.0 SCOPE OF SERVICES

The scope of services requested by Caltrans in TO No. 65 included the collection of soil samples for analysis to determine lead and asbestos content, and the preparation of this report.

3.1 Pre-field Activities

- Retained the services of Advanced Technology Laboratories (ATL), a Caltrans-approved and California-certified analytical laboratory, to perform lead analysis of soil samples.
- Retained the services of EMSL Inc., a Caltrans-approved analytical laboratory, to perform asbestos analysis of samples.
- Reviewed documents pertaining to the geologic setting of the site vicinity.

3.2 Field Activities

On November 4, 2015, a Geocon Certified Engineering Geologist experienced in conducting NOA assessments performed a geologic reconnaissance of the Site and collected soil samples for lead and NOA analysis.

We advanced fifteen hand-auger borings (HA1 through HA15) to an approximate sampling depth of 2.0 feet on the eastbound (EB) and westbound (WB) shoulders of SR-70 between PM 50.3 and 53.0. We also advanced four hand-auger borings (HA16 through HA19) to an approximate sampling depth of 1.0 foot at locations beneath the Spring Garden Bridge and Overhead. Soil samples were collected at

approximate depth intervals of 0.0 to 1.0 foot and 1.0 to 2.0 feet in borings HA1 through HA15, and at an approximate depth interval of 0.5 to 1.0 foot in borings HA16 through HA19.

The sampling locations were selected in the field by the Geocon field supervisor and Caltrans TO Manager to provide representative samples of geologic material at the Site. The approximate sampling locations are depicted on the Site Plan, Figure 2.

4.0 INVESTIGATIVE METHODS

4.1 ADL Soil Sampling

A total of thirty soil samples were collected for lead analysis from fifteen ADL hand-auger borings (HA1 through HA15). Two soil samples were collected from each boring, from depth intervals of 0.0 to 1.0 feet and 1.0 to 2.0 feet. The soil samples were transferred directly from the hand-auger to labeled Ziploc[®] re-sealable plastic bags and homogenized in the field.

Each of the sample bags was subsequently labeled, placed in an ice chest, and delivered to ATL for analytical testing under chain-of-custody (COC) documentation.

The coordinates of the boring locations were determined using a differential global positioning system (GPS). The GPS was utilized during the field activities to locate the horizontal position of the boring locations with an error of no more than 3.3 feet. The latitude and longitude of the boring locations are summarized on Table 1.

4.2 NOA Soil Sampling

A total of nineteen soil samples were collected for NOA analysis from nineteen hand-auger borings (HA1 through HA19). Prior to sample collection, we conducted a reconnaissance assessment of the exposed soil and rock types present within cut slopes and along the roadway shoulders at the Site. We obtained soil samples for NOA analysis from the fifteen ADL borings (HA1 through HA15) and four additional hand-auger borings (HA16 through HA19) performed near bents beneath the Spring Garden Bridge and Overhead.

ADL samples collected from a depth interval of 1.0 to 2.0 feet (HA1-1 through HA15-1) were split into two samples, and the second sample was placed in a labeled Ziploc[®] re-sealable plastic bag with sample identification for asbestos analysis. Samples collected from borings HA16 through HA19 at a depth interval of 0.5 to 1.0 foot were transferred directly from the hand-auger to labeled Ziploc[®] re-sealable plastic bags and subsequently delivered to EMSL for asbestos analysis under COC protocol.

4.2 Quality Assurance/Quality Control (QA/QC) Procedures

QA/QC procedures were performed during the field exploration activities. These procedures included the decontamination of sampling equipment before each sample was collected and providing COC documentation for each sample submitted to the laboratories. The soil samples were collected using clean nitrile-gloved hands. The hand-augers used during sampling were double-rinsed between sample locations with clean tap water. The decontamination water was discharged to the ground surface within the Caltrans right-of-way, away from the roadway and storm drain inlets.

4.3 Laboratory Analyses

4.3.1 ADL Soil Samples

Thirty soil samples (HA1 through HA15) were analyzed for total lead following United States Environmental Protection Agency (EPA) Test Method 6010B under standard turnaround time (TAT). The laboratory was instructed to homogenize the soil samples prior to analysis in accordance with Contract 03A2132 requirements.

4.3.2 NOA Samples

EMSL performed asbestos fiber analysis on nineteen soil samples under two-week TAT. EMSL analyzed the samples for asbestos using polarized light microscopy (PLM) by CARB Method 435. The CARB 435 preparation includes milling the sample to a -200 mesh size which also homogenizes the sample. The analytical sensitivity of the PLM analysis was 0.25% by area.

4.3.3 Laboratory QA/QC Procedures

QA/QC procedures were performed by ATL as applicable for the method of analysis with specificity for each analyte listed in the test method's QA/QC. QA/QC measures for the lead analysis included the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever was more frequent, with the spike made at ten times the detection limit or at the analyte level.

Prior to submitting the samples to the laboratories, the COC documentation was reviewed for accuracy and completeness. Copies of the laboratory reports and COC documentation are presented in Appendix A.

5.0 FIELD OBSERVATIONS AND INVESTIGATIVE RESULTS

5.1 Site Geology

We reviewed the *Geologic Map of the Chico Quadrangle* (Department of Conservation, Division of Mines and Geology, Scale 1:250,000, 1992) pertaining to the geologic setting of the Site. The map depicts the geologic units underlying the Site as Paleozoic ultramafic rock, undifferentiated mélangé of the Paleozoic Shoo Fly Complex (metasedimentary, metavolcanic, gabbro, and/or serpentized ultramafic rocks), and Miocene-Pliocene volcanic rocks. Generally, ultramafic rocks are depicted in the western portion of the Site.

John Pfeiffer, a California Certified Engineering Geologist (CEG 2372) with experience in the assessment of NOA, performed the geologic assessment of the site vicinity. We observed serpentized ultramafic rock in cut slopes and outcrops beneath and west of the Spring Garden Bridge and Overhead. East of the bridge, we noted a transition to older alluvial deposits (ancient river terrace) and weathered metasedimentary rock, materials not considered likely to contain NOA.

Materials observed during advancement of the hand-auger borings generally consisted of fill and weathered bedrock materials. The fill consisted of brown, grayish-brown, or yellowish-brown silty sand with gravel. Gravel in the fill material consisted of varied proportions of metavolcanic, volcanic, metasedimentary, and ultramafic rock.

With regard to roadway improvement plans and anticipated soil disturbance areas, soil/rock encountered east of Station 59+00 on the Site is not likely to contain NOA. Materials encountered west of Station 59+00 on the Site consist predominantly of ultramafic rock and are considered likely to contain NOA.

5.2 ADL Soil Analytical Results

Total lead was detected in each of the thirty samples analyzed at concentrations ranging from 1.4 to 34 mg/kg, less than 50 mg/kg (ten times the STLC value for lead of 5.0 mg/l).

A summary of the ADL analytical results are presented on Table 2. A copy of the ATL laboratory report and COC documentation are in Appendix A.

5.3 NOA Results

Results for sixteen of the nineteen samples (HA1-1 through HA8-1, HA10-1 through HA15-1, HA18-0.5 and HA19-0.5) were reported as none detected for asbestos and 100% non-fibrous. One sample (HA9-1) was reported to contain chrysotile asbestos at less than the laboratory reporting limit of 0.25%. Two samples, HA16-0.5 and HA17-0.5, collected beneath the bridge at the easternmost two bents, were reported

to contain chrysotile asbestos at area percentages of 0.75% and 14.25%, respectively, by the PLM method.

A summary of NOA analytical results is on Table 3. Copies of the EMSL laboratory report and COC documentation are in Appendix A.

5.4 Review of Laboratory QA/QC

We reviewed the QA/QC provided with the ATL laboratory reports. The relative percent differences for two duplicates were outside acceptance criteria. Calculation is based on raw values as noted in the laboratory reports. Based on the laboratory QA/QC data, no additional qualification of the data presented herein is necessary, and the data are of sufficient quality for the purposes of this report.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 ADL

Total lead concentrations for the soil samples collected at the Site ranged from 1.4 to 34 mg/kg, less than 50 mg/kg (ten times the lead STLC of 5.0 mg/l). Soil excavated to the maximum sampling depth of 2 feet within the project limits as represented by borings HA1 through HA15 will not require special soil handling and disposal procedures based on lead content and can be reused or disposed of as non-hazardous soil since the total lead concentrations are less than 50 mg/kg.

6.2 Naturally Occurring Asbestos

NOA is a State of California regulated substance and may be present in ultramafic rocks. Based on the presence of ultramafic rocks and associated potential for NOA at the Site, engineering controls are required for work at that location to minimize the potential aerial dispersion of NOA as described in CCR 93105.

Based on field observations and laboratory analytical results, we recommend that the Site be divided into three sub-areas for the purpose of soil management during the proposed roadway improvement project. The three sub-areas are discussed in Sections 6.2.1 through 6.2.3.

6.2.1 Station 40+50 to 54+00 – Samples HA7 through HA14, HA18, and HA19

The geologic materials within this sub-area consist predominantly of ultramafic rock, which is considered likely to contain NOA. Chrysotile asbestos was reported in one of ten samples collected from this sub-area at less than 0.25% by PLM. We recommend that earthen material generated from roadway improvement activities within this sub-area be managed as Restricted Material with less than 1% asbestos. The contractor(s) should implement NOA-containing soil management practices and asbestos worker protection measures as discussed in Sections 6.2.4 and 6.2.5.

6.2.2 Station 54+00 to 59+00 – Samples HA6 and HA15 through HA17

The native geologic materials within this sub-area consist predominantly of sheared and serpentized ultramafic rock, which is considered likely to contain NOA. Chrysotile and tremolite asbestos were reported in two samples of soil collected within this sub-area beneath the eastern portion of the bridge (HA16 and HA17) at concentrations of 0.75% and 14.25% by PLM, respectively. We recommend that earthen material generated from excavations of soil/rock at the bridge bents and abutment on the east side of Greenhorn Creek, if applicable, be managed as Restricted Material with greater than or equal to 1% asbestos as discussed in Section 6.2.4. The contractor(s) should implement NOA-containing soil management practices and asbestos worker protection measures as discussed in Sections 6.2.3 and 6.2.4.

6.2.3 Station 59+00 to 63+50 – Samples HA1 through HA5

The geologic materials within this sub-area consist primarily of older alluvial deposits (ancient river terrace) and weathered metasedimentary rock. These materials are not considered likely to contain NOA, and NOA was not detected at concentrations of 0.25% or greater in the five samples of soil (HA1 through HA5) collected in this portion of the Site. Therefore, material generated from the proposed roadway improvement project within this sub-area can be reused or disposed of without restrictions with regard to NOA.

6.2.4 NOA-containing Soil Management

The contractor(s) should prepare and implement an Asbestos Dust Mitigation Plan (ADMP) that describes measures that will be taken to control the potential release of NOA-containing dust from the soil/rock as a result of construction excavation activities. Asbestos dust control activities to be implemented shall be in compliance with the following:

- CCR § 93105 – Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations (ATCM 93105);
- CCR § 93106 – Asbestos Airborne Toxic Control Measure for Surfacing Applications (ATCM 93106); and
- Northern Sierra Air Quality Management District guidelines.

According to Title 17 CCR, §93106(i)(20), the soil/rock material within the western sub-area of the Site is considered Restricted Material because ultramafic rock is present in the it contains asbestos at 0.25% or greater. Therefore, it cannot be used in such a way as to fall under the definition of surfacing (Title 17 CCR, §93106(i)(26)). Title 17 CCR, §93105(e)(4)(G) requires that disturbed asbestos-containing material (0.25% asbestos or greater) must be stabilized via options that include paving or covering with at least 3 inches of non-asbestos-containing material (less than 0.25% asbestos).

We understand that it is Caltrans policy for excess soil with greater than or equal to 1.0% asbestos to be disposed of within Caltrans' right-of-way, at a Caltrans disposal site, or at an appropriately permitted landfill.

Any party, other than a permitted landfill, receiving NOA-containing soil must be provided the following warning statement:

"WARNING!

This material may contain asbestos.

It is unlawful to use this material for surfacing or any application in which it would remain exposed and subject to possible disturbance.

Extreme care should be taken when handling this material to minimize the generation of dust."

Construction/maintenance activities involving NOA-containing soil may fall under regulatory jurisdiction of the California Division of the Occupational Safety and Health Administration (Cal-OSHA) under CCR Title 8 §5208. Mitigation measures during construction/maintenance activities should be utilized to minimize releases of NOA to air (dust control) and surface waters (stormwater discharge).

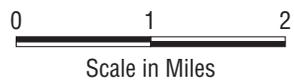
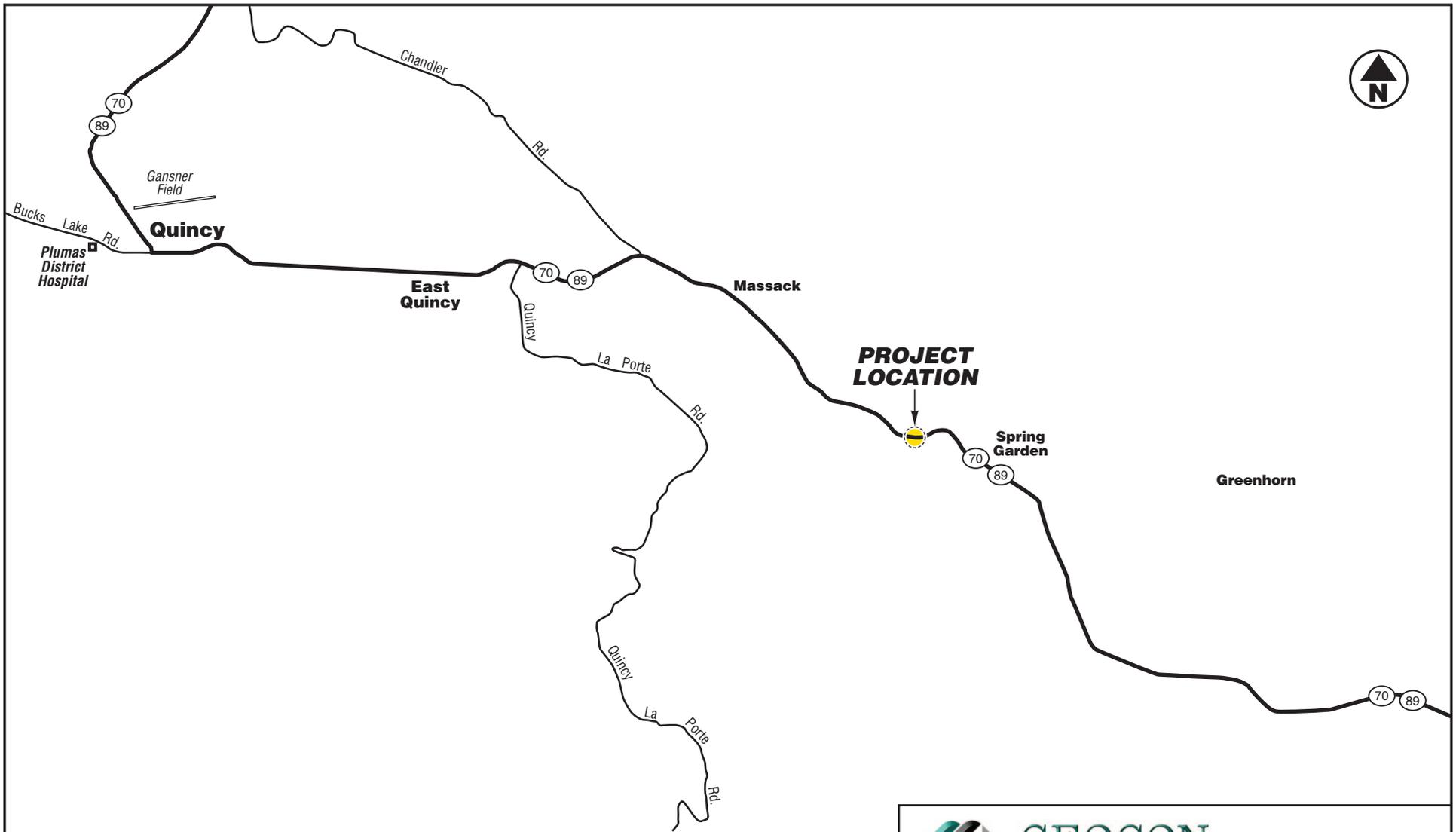
6.2.5 Asbestos Risk to Human Health

Currently, regulatory exposure limits and health hazard data are not available for NOA in soils. Federal regulations governing asbestos define it as the asbestiform variety of the amphibole minerals actinolite, amosite, anthophyllite, crocidolite, and tremolite, and the asbestiform variety of serpentine, chrysotile. Asbestos fibers occurring in industrial materials are considered by the National Institute for Occupational Safety and Health (NIOSH) as potential occupational carcinogens. Prudence is recommended, therefore, in dealing with soils containing NOA. Engineering controls such as wet suppression should be utilized to minimize aerial dispersion of NOA fibers in planned work areas during excavation and road construction activities. Under Title 8 §5208 of the CCR, disturbance of asbestos-containing materials requires wet working methods and possible respiratory protection and air monitoring. The CARB has established protocols outlined in Title 17, §93105 for the implementation of worker health, safety and monitoring plans for excavation, grading and transport of NOA-containing soils. Contractors working in the study areas identified as containing or likely to contain NOA should consult Title 17, §93105 and contact Cal-OSHA to establish the appropriate regulatory protocol and actions necessary for excavation and/or disturbance of asbestos-containing soils.

7.0 REPORT LIMITATIONS

This report has been prepared exclusively for Caltrans. The information contained herein is only valid as of the date of the report and will require an update to reflect additional information obtained.

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



 **GEOCON**
CONSULTANTS, INC.
3160 GOLD VALLEY DR - SUITE 800 - RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 - FAX 916.852.9132

Spring Garden Bridge and Overhead

GEOCON Proj. No. S9805-01-65
Task Order No. 65
E-FIS 02-0000-0161-1
EA 02-2C0901
Caltrans Contract 03A2132

VICINITY MAP
December 2015 | Figure 1



LEGEND:

- HA1 ⊗ Approximate Hand-Auger Boring Location
- * Sample Collected Beneath Bridge



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EA 02-2C0901
Caltrans Contract 03A2132

SITE PLAN

December 2015 | Figure 2

TABLE 1
SUMMARY OF SOIL BORING COORDINATES
EA 02-2C0901
STATE ROUTE 70 (02-PLU-70) POST MILE 50.3 TO 53.0
PLUMAS COUNTY, CALIFORNIA

BORING ID	SAMPLE DATE	LATITUDE	LONGITUDE
HA1	11/4/2015	39.912189	-120.809066
HA2	11/4/2015	39.911922	-120.809856
HA3	11/4/2015	39.912184	-120.808745
HA4	11/4/2015	39.911949	-120.809432
HA5	11/4/2015	39.911762	-120.810554
HA6	11/4/2015	39.911708	-120.811775
HA7	11/4/2015	39.911778	-120.813495
HA8	11/4/2015	39.911994	-120.815103
HA9	11/4/2015	39.912495	-120.816106
HA10	11/4/2015	39.913020	-120.816766
HA11	11/4/2015	39.912884	-120.816809
HA12	11/4/2015	39.912404	-120.816225
HA13	11/4/2015	39.911907	-120.815232
HA14	11/4/2015	39.911662	-120.81356
HA15	11/4/2015	39.911601	-120.811696
HA16	11/4/2015	39.911667	-120.812005
HA17	11/4/2015	39.911672	-120.81224
HA18	11/4/2015	39.911691	-120.812590
HA19	11/4/2015	39.911696	-120.812796

TABLE 2
 SUMMARY OF SOIL ANALYTICAL RESULTS - LEAD
 EA 02-2C0901
 STATE ROUTE 70 (02-PLU-70) POST MILE 50.3 TO 53.0
 PLUMAS COUNTY, CALIFORNIA

BORING ID	SAMPLE DEPTH (feet)	TOTAL LEAD (mg/kg)
HA1-0	0	11
HA1-1	1	6.3
HA2-0	0	5.0
HA2-1	1	8.4
HA3-0	0	5.4
HA3-1	1	9.5
HA4-0	0	6.0
HA4-1	1	19
HA5-0	0	7.0
HA5-1	1	9.5
HA6-0	0	11
HA6-1	1	10
HA7-0	0	8.6
HA7-1	1	7.0
HA8-0	0	7.4
HA8-1	1	23
HA9-0	0	7.4
HA9-1	1	18
HA10-0	0	8.3
HA10-1	1	10
HA11-0	0	4.7
HA11-1	1	29
HA12-0	0	4.0
HA12-1	1	34
HA13-0	0	3.8
HA13-1	1	1.4
HA14-0	0	3.6
HA14-1	1	6.8
HA15-0	0	6.1
HA15-1	1	14

Notes:

HA1-0

 Top of sample depth interval in feet below ground surface
 Boring identification

mg/kg = Milligrams per kilogram

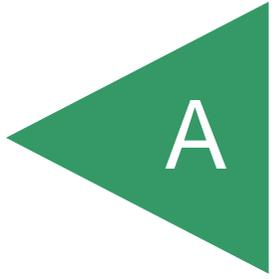
TABLE 3
 SUMMARY OF SOIL ANALYTICAL RESULTS - ASBESTOS
 EA 02-2C0901
 STATE ROUTE 70 (02-PLU-70) POST MILE 50.3 TO 53.0
 PLUMAS COUNTY, CALIFORNIA

SAMPLE I.D.	SAMPLE DATE	ANALYTICAL METHOD	ASBESTOS %	ASBESTOS TYPE
HA1-1	11/4/2015	PLM	ND	None Reported
HA2-1	11/4/2015	PLM	ND	None Reported
HA3-1	11/4/2015	PLM	ND	None Reported
HA4-1	11/4/2015	PLM	ND	None Reported
HA5-1	11/4/2015	PLM	ND	None Reported
HA6-1	11/4/2015	PLM	ND	None Reported
HA7-1	11/4/2015	PLM	ND	None Reported
HA8-1	11/4/2015	PLM	ND	None Reported
HA9-1	11/4/2015	PLM	<0.25%	Chrysotile
HA10-1	11/4/2015	PLM	ND	None Reported
HA11-1	11/4/2015	PLM	ND	None Reported
HA12-1	11/4/2015	PLM	ND	None Reported
HA13-1	11/4/2015	PLM	ND	None Reported
HA14-1	11/4/2015	PLM	ND	None Reported
HA15-1	11/4/2015	PLM	ND	None Reported
HA16-0.5	11/4/2015	PLM	0.75%	Chrysotile
HA17-0.5	11/4/2015	PLM	14.25%	Tremolite
HA18-0.5	11/4/2015	PLM	ND	None Reported
HA19-0.5	11/4/2015	PLM	ND	None Reported

Notes:
 PLM = Polarized Light Microscopy
 ND = Not detected
 < = Less than the laboratory reporting limit

APPENDIX

A





November 13, 2015

John Pfeiffer
Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
Tel: (916) 852-9118
Fax:(916) 852-9132

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1503832
Client Reference : Spring Garden Bridge S9805-01-65

Enclosed are the results for sample(s) received on November 06, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', written in a cursive style.

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.

*3275 Walnut Avenue, Signal Hill, CA 90755 • Tel: 562-989-4045 • Fax: 562-989-4040
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Certificate of Analysis

Geocon Consultants, Inc.

3160 Gold Valley Drive, Suite 800

Rancho Cordova , CA 95742

Project Number : Spring Garden Bridge S9805-01-65

Report To : John Pfeiffer

Reported : 11/13/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA1-0	1503832-01	Soil	11/04/15 9:42	11/06/15 8:44
HA1-1	1503832-02	Soil	11/04/15 9:45	11/06/15 8:44
HA2-0	1503832-03	Soil	11/04/15 9:51	11/06/15 8:44
HA2-1	1503832-04	Soil	11/04/15 9:55	11/06/15 8:44
HA3-0	1503832-05	Soil	11/04/15 10:08	11/06/15 8:44
HA3-1	1503832-06	Soil	11/04/15 10:13	11/06/15 8:44
HA4-0	1503832-07	Soil	11/04/15 10:24	11/06/15 8:44
HA4-1	1503832-08	Soil	11/04/15 10:28	11/06/15 8:44
HA5-0	1503832-09	Soil	11/04/15 10:51	11/06/15 8:44
HA5-1	1503832-10	Soil	11/04/15 10:54	11/06/15 8:44
HA6-0	1503832-11	Soil	11/04/15 10:51	11/06/15 8:44
HA6-1	1503832-12	Soil	11/04/15 10:54	11/06/15 8:44
HA7-0	1503832-13	Soil	11/04/15 11:11	11/06/15 8:44
HA7-1	1503832-14	Soil	11/04/15 11:12	11/06/15 8:44
HA8-0	1503832-15	Soil	11/04/15 11:15	11/06/15 8:44
HA8-1	1503832-16	Soil	11/04/15 11:22	11/06/15 8:44
HA9-0	1503832-17	Soil	11/04/15 11:18	11/06/15 8:44
HA9-1	1503832-18	Soil	11/04/15 11:24	11/06/15 8:44
HA10-0	1503832-19	Soil	11/04/15 11:36	11/06/15 8:44
HA10-1	1503832-20	Soil	11/04/15 11:41	11/06/15 8:44
HA11-0	1503832-21	Soil	11/04/15 11:35	11/06/15 8:44
HA11-1	1503832-22	Soil	11/04/15 11:40	11/06/15 8:44
HA12-0	1503832-23	Soil	11/04/15 11:49	11/06/15 8:44
HA12-1	1503832-24	Soil	11/04/15 11:54	11/06/15 8:44
HA13-0	1503832-25	Soil	11/04/15 12:00	11/06/15 8:44
HA13-1	1503832-26	Soil	11/04/15 12:05	11/06/15 8:44
HA14-0	1503832-27	Soil	11/04/15 12:01	11/06/15 8:44
HA14-1	1503832-28	Soil	11/04/15 12:04	11/06/15 8:44
HA15-0	1503832-29	Soil	11/04/15 12:24	11/06/15 8:44
HA15-1	1503832-30	Soil	11/04/15 12:31	11/06/15 8:44



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3160 Gold Valley Drive, Suite 800

Rancho Cordova, CA 95742

Project Number : Spring Garden Bridge S9805-01-65

Report To : John Pfeiffer

Reported : 11/13/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1503832-01	HA1-0	11	mg/kg	1.0	1	B5K0307	11/12/2015	11/12/15 13:36	
1503832-02	HA1-1	6.3	mg/kg	1.0	1	B5K0307	11/12/2015	11/12/15 13:40	
1503832-03	HA2-0	5.0	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 13:49	
1503832-04	HA2-1	8.4	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 13:50	
1503832-05	HA3-0	5.4	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 13:51	
1503832-06	HA3-1	9.5	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 13:55	
1503832-07	HA4-0	6.0	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 13:56	
1503832-08	HA4-1	19	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 13:58	
1503832-09	HA5-0	7.0	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 13:59	
1503832-10	HA5-1	9.5	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:00	
1503832-11	HA6-0	11	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:01	
1503832-12	HA6-1	10	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:03	
1503832-13	HA7-0	8.6	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:06	
1503832-14	HA7-1	7.0	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:10	
1503832-15	HA8-0	7.4	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:11	
1503832-16	HA8-1	23	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:12	
1503832-17	HA9-0	7.4	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:13	
1503832-18	HA9-1	18	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:15	
1503832-19	HA10-0	8.3	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:16	
1503832-20	HA10-1	10	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:17	
1503832-21	HA11-0	4.7	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:18	
1503832-22	HA11-1	29	mg/kg	1.0	1	B5K0308	11/12/2015	11/12/15 14:19	
1503832-23	HA12-0	4.0	mg/kg	1.0	1	B5K0309	11/12/2015	11/12/15 14:30	
1503832-24	HA12-1	34	mg/kg	1.0	1	B5K0309	11/12/2015	11/12/15 14:31	
1503832-25	HA13-0	3.8	mg/kg	1.0	1	B5K0309	11/12/2015	11/12/15 14:32	
1503832-26	HA13-1	1.4	mg/kg	1.0	1	B5K0309	11/12/2015	11/12/15 14:33	
1503832-27	HA14-0	3.6	mg/kg	1.0	1	B5K0309	11/12/2015	11/12/15 14:35	
1503832-28	HA14-1	6.8	mg/kg	1.0	1	B5K0309	11/12/2015	11/12/15 14:38	
1503832-29	HA15-0	6.1	mg/kg	1.0	1	B5K0309	11/12/2015	11/12/15 14:40	
1503832-30	HA15-1	14	mg/kg	1.0	1	B5K0309	11/12/2015	11/12/15 14:41	



Certificate of Analysis

Geocon Consultants, Inc.
 3160 Gold Valley Drive, Suite 800
 Rancho Cordova , CA 95742

Project Number : Spring Garden Bridge S9805-01-65
 Report To : John Pfeiffer
 Reported : 11/13/2015

QUALITY CONTROL SECTION

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5K0307 - EPA 3050 Modified_S									
Blank (B5K0307-BLK1)					Prepared: 11/12/2015 Analyzed: 11/12/2015				
Lead	ND	1.0					NR		
Blank (B5K0307-BLK2)					Prepared: 11/12/2015 Analyzed: 11/12/2015				
Lead	ND	1.0					NR		
LCS (B5K0307-BS1)					Prepared: 11/12/2015 Analyzed: 11/12/2015				
Lead	47.4129	1.0	50.0000		94.8	80 - 120			
Duplicate (B5K0307-DUP1)					Prepared: 11/12/2015 Analyzed: 11/12/2015				
Lead	5.93634	1.0		6.29213	NR		5.82	20	
Duplicate (B5K0307-DUP2)					Prepared: 11/12/2015 Analyzed: 11/12/2015				
Lead	6.99228	1.0		7.36940	NR		5.25	20	
Matrix Spike (B5K0307-MS1)					Prepared: 11/12/2015 Analyzed: 11/12/2015				
Lead	208.618	1.0	250.000	6.29213	80.9	35 - 129			
Matrix Spike (B5K0307-MS2)					Prepared: 11/12/2015 Analyzed: 11/12/2015				
Lead	213.974	1.0	250.000	7.36940	82.6	35 - 129			
Matrix Spike Dup (B5K0307-MSD1)					Prepared: 11/12/2015 Analyzed: 11/12/2015				
Lead	204.943	1.0	250.000	6.29213	79.5	35 - 129	1.78	20	



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Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5K0308 - EPA 3050 Modified_S								
Blank (B5K0308-BLK1)								
Lead	ND	1.0			NR			
Prepared: 11/12/2015 Analyzed: 11/12/2015								
Blank (B5K0308-BLK2)								
Lead	ND	1.0			NR			
Prepared: 11/11/2015 Analyzed: 11/12/2015								
LCS (B5K0308-BS1)								
Lead	46.9446	1.0	50.0000		93.9 80 - 120			
Prepared: 11/11/2015 Analyzed: 11/12/2015								
Duplicate (B5K0308-DUP1)								
Lead	39.5087	1.0		29.0799	NR	30.4	20	R
Source: 1503832-22 Prepared: 11/11/2015 Analyzed: 11/12/2015								
Duplicate (B5K0308-DUP2)								
Lead	8.28258	1.0		10.3568	NR	22.3	20	R
Source: 1503832-12 Prepared: 11/11/2015 Analyzed: 11/12/2015								
Matrix Spike (B5K0308-MS1)								
Lead	228.732	1.0	250.000	29.0799	79.9 35 - 129			
Source: 1503832-22 Prepared: 11/11/2015 Analyzed: 11/12/2015								
Matrix Spike (B5K0308-MS2)								
Lead	201.093	1.0	250.000	10.3568	76.3 35 - 129			
Source: 1503832-12 Prepared: 11/11/2015 Analyzed: 11/12/2015								
Matrix Spike Dup (B5K0308-MSD1)								
Lead	225.986	1.0	250.000	29.0799	78.8 35 - 129	1.21	20	
Source: 1503832-22 Prepared: 11/11/2015 Analyzed: 11/12/2015								



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Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	Limits	RPD	RPD Limit	Notes
Batch B5K0309 - EPA 3050 Modified_S									
Blank (B5K0309-BLK1)									
Lead	ND	1.0							Prepared: 11/12/2015 Analyzed: 11/12/2015 NR
LCS (B5K0309-BS1)									
Lead	47.5523	1.0	50.0000		95.1	80 - 120			Prepared: 11/12/2015 Analyzed: 11/12/2015
Duplicate (B5K0309-DUP1)									
Lead	14.2116	1.0		13.6155	NR		4.28	20	Source: 1503832-30 Prepared: 11/12/2015 Analyzed: 11/12/2015
Matrix Spike (B5K0309-MS1)									
Lead	191.728	1.0	250.000	13.6155	71.2	35 - 129			Source: 1503832-30 Prepared: 11/12/2015 Analyzed: 11/12/2015
Matrix Spike Dup (B5K0309-MSD1)									
Lead	180.895	1.0	250.000	13.6155	66.9	35 - 129	5.81	20	Source: 1503832-30 Prepared: 11/12/2015 Analyzed: 11/12/2015



Certificate of Analysis

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3160 Gold Valley Drive, Suite 800

Rancho Cordova, CA 95742

Project Number : Spring Garden Bridge S9805-01-65

Report To : John Pfeiffer

Reported : 11/13/2015

Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
- (3) Results are wet unless otherwise specified.

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY

Method of Transport:
 Client ATL OnTrac
 FedEx GSO Other: Signature

Sample Condition Upon Receipt:
 1. CHILLED Y N 4. SEALED Y N
 2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
 3. CONTAINER INTACT Y N 6. PRESERVED Y N

Quote #: CT Contract 03A2132 Date: _____
 Logged By: _____
NOTE: Please include your Quote No. to ensure proper pricing of your project.

Client: Geocoin Consultants, Inc.
 Attention: John Pfeiffer
 Project #: S9805-01-65
 Project Name: Spring Garden Bridge

Address: 3160 Gold Valley Drive, Suite 800
 City: Rancho Cordova State: CA Zip Code: 95742
 Tel: 916-852-9118 Fax: 916-852-9132

Sampler: John Pfeiffer
 Received by: (Signature and Printed Name) John Pfeiffer Date: 11/5/15 Time: 08:44
 Received by: (Signature and Printed Name) MS-Don M... 6/11/15 Date: 11/5/15 Time: 08:44

I hereby authorize ATL to perform the work indicated below:
 Project Mgr /Submitter: John Pfeiffer Date: 11/5/15
 Print Name: John Pfeiffer Signature: [Signature]
 Address: 3160 Gold Valley Drive, Suite 800 City: Rancho Cordova State: CA Zip: 95742

Send Report To: Geocoin Consultants, Inc. Attn: John Pfeiffer
 Address: 3160 Gold Valley Drive, Suite 800 City: Rancho Cordova State: CA Zip: 95742

Special Instructions/Comments: _____

LAB USE ONLY:

Batch #	Lab No.	Sample ID / Location	Sample Description	Date	Time
150382-1		HA1-0		11/4/15	0942
		HA1-1			0945
		HA2-0			951
		HA2-1			955
		HA3-0			1008
		HA3-1			1013
		HA4-0			1024
		HA4-1			1028
		HA5-0			1031
		HA5-1			1034

Sample/Records - Archival & Disposal
 Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
 ■ Sample: \$2.00 / sample /mo (after 45 days)
 ■ Records: \$1 /ATL workorder /mo (after 1 year)

Specify Appropriate Matrix:

Matrix	Container(s)	TAT	Type
SEDIMENT			
SOIL			
DRINKING WATER			
GROUND WATER			
WASTEWATER			
STORMWATER			
AQUEOUS			

QA/QC

RTNE	CT	Legal	SWRCB Logcode	OTHER	REMARKS

Preservatives:
 H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

CHAIN OF CUSTODY RECORD

ADVANCED TECHNOLOGY LABORATORIES

3275 Walnut Ave., Signal Hill, CA 90755
Tel: (562) 989-4045 • Fax: (562) 989-4040

Client: Geoco Consultants, Inc.
Attention: John Pfeiffer

Project Name: Spring Garden Bridge
Project #: S9805-01-65

Relinquished by: (Signature and Printed Name)
John Pfeiffer Date: 11/5/15

Relinquished by: (Signature and Printed Name)
John Pfeiffer Date: 11/5/15

Relinquished by: (Signature and Printed Name)
John Pfeiffer Date: 11/5/15

P.O. #: _____ Quote #: CT Contract 03A2132
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

Address: 3160 Gold Valley Drive, Suite 800
City: Rancho Cordova State: CA Zip Code: 95742

Method of Transport
 Client ATL FedEx GSO Other:

Sample Condition Upon Receipt
1. CHILLED Y N 4. SEALED Y N
2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
3. CONTAINER INTACT Y N 6. PRESERVED Y N

Sampler: John Pfeiffer
Received by: (Signature and Printed Name)
John Pfeiffer Date: 11/6/15 Time: 08:44

Received by: (Signature and Printed Name)
John Pfeiffer Date: 11/6/15 Time: 08:44

Received by: (Signature and Printed Name)
John Pfeiffer Date: 11/6/15 Time: 08:44

FOR LABORATORY USE ONLY

Special Instructions/Comments:

Bill To: _____ SAME AS ABOVE
Attn: _____
Co: John Pfeiffer
Addr: 3160 Gold Valley Drive, Suite 800
City: Rancho Cordova State: CA Zip: 95742

Circle or Add Analysis(es) Requested

8015B (GR) 8015B (DR) 8015B (OR) 8010B (Total Pb) 8010B (Total Pb) Gas Package: GR & BTEX 8260B (VOCs) 8270C (SVOCs) 8013 for Ethylene Glycol WET Pb 8015 for Ethylene Glycol

SEMENT SOIL DRINKING WATER WASTEWATER STORMWATER AQUEOUS

Container(s) # Type

QA/QC RTNE CT Legal SWRCB Logcode OTHER REMARKS

I hereby authorize ATL to perform the work indicated below:

Project Mgr / Submitter: John Pfeiffer
Print Name: John Pfeiffer Date: 11/5/15
Signature: *John Pfeiffer*

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
 Sample: \$2.00 / sample /mo (after 45 days)
 Records: \$1 /ATL workorder /mo (after 1 year)

LAB USE ONLY:	Sample Description	Date	Time
150332-4	HAS-0	11/4/15	1051
-5	HAS-1	1054	
-6	HAS-2	1111	
-7	HAS-3	1112	
-8	HAS-4	1115	
-9	HAS-5	1122	
-10	HAS-6	1118	
-11	HAS-7	1124	
-12	HAS-8	1136	
-13	HAS-9	1141	

TAT: _____
 A = ≤ 24 hrs
 B = _____
 C = _____
 D = _____
 E = _____
 F = _____
 G = _____
 H = _____
 I = _____
 J = _____
 K = _____
 L = _____
 M = _____
 N = _____
 O = _____
 P = _____
 Q = _____
 R = _____
 S = _____
 T = _____
 U = _____
 V = _____
 W = _____
 X = _____
 Y = _____
 Z = _____

Preservatives:
H=HCl N=HNO₃ S=H₂SO₄ C=4°C
Z=Zn(AC)₂ O=NaOH M=Metal



EMSL Analytical, Inc

464 McCormick Street, San Leandro, CA 94577

Phone/Fax: (510) 895-3675 / (510) 895-3680

<http://www.EMSL.com>

sanleandrolab@emsl.com

EMSL Order:	091519436
CustomerID:	GECN80
CustomerPO:	
ProjectID:	S9805-**-**

Attn: **John Pfeiffer**
Geocon Consultants, Inc.
3160 Gold Valley Drive
Suite 800
Rancho Cordova, CA 95742

Phone: (916) 852-9118
 Fax: (916) 852-9132
 Received: 11/10/15 9:00 AM
 Analysis Date: 11/23/2015
 Collected: 11/5/2015

Project: **Spring Gardens Bridge s9805-01-55**

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
HA1-1 <i>091519436-0001</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA2-1 <i>091519436-0002</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA3-1 <i>091519436-0003</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA4-1 <i>091519436-0004</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA5-1 <i>091519436-0005</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA6-1 <i>091519436-0006</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA7-1 <i>091519436-0007</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected

Analyst(s)

 Matthew Batongbacal (19)



 Chris Dojlidko, Laboratory Manager
 or other approved signatory

This report relates only to the samples listed above and may not be reproduced except in full, without EMSL's written approval. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. EMSL is not responsible for sample collection activities or method limitations. Some samples may contain asbestos fibers below the resolution limit of PLM. EMSL recommends that samples reported as none detected or less than the limit of detection undergo additional analysis via TEM. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 11/23/2015 20:52:04

**EMSL Analytical, Inc**

464 McCormick Street, San Leandro, CA 94577

Phone/Fax: (510) 895-3675 / (510) 895-3680

<http://www.EMSL.com>sanleandrolab@emsl.com

EMSL Order:	091519436
CustomerID:	GECN80
CustomerPO:	
ProjectID:	S9805-**-**

Attn: **John Pfeiffer**
Geocon Consultants, Inc.
3160 Gold Valley Drive
Suite 800
Rancho Cordova, CA 95742

Phone: (916) 852-9118
 Fax: (916) 852-9132
 Received: 11/10/15 9:00 AM
 Analysis Date: 11/23/2015
 Collected: 11/5/2015

Project: **Spring Gardens Bridge s9805-01-55**

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
HA8-1 <i>091519436-0008</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA9-1 <i>091519436-0009</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
HA10-1 <i>091519436-0010</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA11-1 <i>091519436-0011</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA12-1 <i>091519436-0012</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA13-1 <i>091519436-0013</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA14-1 <i>091519436-0014</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected

Analyst(s)
 Matthew Batongbacal (19)

Chris Dojlidko, Laboratory Manager
 or other approved signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 11/23/2015 20:52:04

**EMSL Analytical, Inc**

464 McCormick Street, San Leandro, CA 94577

Phone/Fax: (510) 895-3675 / (510) 895-3680

<http://www.EMSL.com>sanleandrolab@emsl.com

EMSL Order:	091519436
CustomerID:	GECN80
CustomerPO:	
ProjectID:	S9805-**-**

Attn: **John Pfeiffer**
Geocon Consultants, Inc.
3160 Gold Valley Drive
Suite 800
Rancho Cordova, CA 95742

Phone: (916) 852-9118
 Fax: (916) 852-9132
 Received: 11/10/15 9:00 AM
 Analysis Date: 11/23/2015
 Collected: 11/5/2015

Project: **Spring Gardens Bridge s9805-01-55**

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
HA15-1 <i>091519436-0015</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA16.05 <i>091519436-0016</i>		Brown Non-Fibrous Homogeneous		99.25% Non-fibrous (other)	0.75% Chrysotile
HA17 0.5 <i>091519436-0017</i>		Brown Non-Fibrous Homogeneous		85.75% Non-fibrous (other)	14.25% Tremolite
HA18 0.5 <i>091519436-0018</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
HA19 0.5 <i>091519436-0019</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected

Analyst(s)

*Matthew Batongbacal (19)*Chris Dojlidko, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 11/23/2015 20:52:04

0913
091519436



Asbestos Lab Services Chain of Custody

EMSL Order Number (Lab Use Only):

091519436

Company: Geoco Consultants, Inc.		EMSL-Bill to: <input checked="" type="checkbox"/> Sr. <small>If Bill to is Different note inst Third Party Billing requires written a...</small>
Street: 3160 Gold Valley Drive, Suite 800		
City/State/Zip: Rancho Cordova, CA 95742		
Report To (Name): John Pfeiffer	Fax:	
Telephone: 916-852-9118	Email Address: pfeiffer@geoconinc.com	
Project Name/Number: <u>Spring Garden Bridge / 59805-01-65</u>		
Please Provide Results: Email	Purchase Order:	State Samples Taken: CA

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule. There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air <input type="checkbox"/> Check if samples are from NY <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA	TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312	TEM - Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167)
PLM - Bulk (reporting limit) <input type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5 TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking	Soil/Rock/Vermiculite <input checked="" type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative)

Check For Positive Stop - Clearly Identify Homogenous Group Filter Pore Size (Air Samples): 0.8µm 0.45µm

Samplers Name: John Pfeiffer/Dave Waters Samplers Signature: [Signature]

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
HA1-1			11/4/15 945
HA2-1			955
HA3-1			1013
HA4-1			1028
HA5-1			1050
HA6-1			1054
HA7-1			1112
HA8-1			1122

Client Sample # (s): HA1-1 - HA19-0.5 Total # of Samples: 19

Relinquished (Client): [Signature] Date: 11/5/15 Time: 16:30

Received (Lab): [Signature] Date: 11/10/15 Time: 9:00 **FX**

Comments/Special Instructions: Billing per Caltrans Contract 03A2132



Asbestos Lab Services Chain of Custody
EMSL Order Number (Lab Use Only):

[Empty box for EMSL Order Number]

San Leandro, CA
 Suite 230
 2235 Polvorosa Ave
 San Leandro, CA 94577
 PHONE: (510) 895-3675
 FAX: (510) 895-3680

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
HA9-1			11/4/15 1124
HA10-1			1141
HA11-1			1140
HA12-1			1154
HA13-1			1205
HA14-1			1204
HA15-1			1231
HA16-0.5			1245
HA17-0.5			1257
HA18-0.5			1254
HA19-0.5			✓ 1248

Comments/Special Instructions:

Controlled Document - Asbestos Lab Services COC - A10 - 11/23/2009

Page 2 of 2 Pages

[Handwritten signature]
[Handwritten signature] 11/10/15 9:10

For Contract No. 02-2C0904

MATERIALS INFORMATION

Cut and Fill Slope Recommendations and Material Information

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. AL TRUJILLO
Senior Transportation Engineer

Date: May 11, 2016

Attn: Mr. Tom Pennick
Project Engineer

File: 02-PLU-70 PM 50.3/53.0
02-2C090
Spring Garden Bridge
Rehabilitation

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Cut and Fill Slope Recommendations and Material Information

This memo, prepared by the Office of Geotechnical Design North (OGDN), provides geotechnical recommendations on cuts and fills, together with material information, pertinent to the design and construction involved in conforming the roadway to the proposed widening of the Spring Garden BOH Bridge (Bridge # 02-0062) on State Highway 70 from PM 50.3 to 53.0 in Plumas County, California. Initially OGDN was tasked by the Office of Design with producing a complete Geotechnical Design Report (GDR) for this work. This task has been reduced to a simple informational memo due to recent geometrics changes by the Office of Design that substantially reduced the scope of earthwork and roadway geotechnical issues, along with a desire by the project development team (PDT) to keep support costs down. For more detailed background geological information on the project please refer to the District Preliminary Geotechnical Report (DPGR; Lewis, July 28, 2009).

Cuts

Approximate Station Interval 51+50 to 51+90 (West End of Bridge)

Very minor cuts, no higher than about 12 feet (ft), are proposed at the west end of the bridge (down station side of the bridge) on the south side of the highway, between stations 51+50 and 51+90. These cuts are in serpentinized ultramafic rocks of the Shoo Fly Formation (Wagner and Saucedo, 1992), which typically contain naturally occurring asbestos (NOA). As stated in the referenced DPGR, these rocks will need to be examined, sampled, and tested by the Hazardous Waste Branch of the Department's North Region Office of Environmental Engineering.

Our Office recommends a maximum cut slope ratio of 0.75:1 (H:V) for these rocks.

Seismic refraction profiling (McNaughton and Owen, 2016) in the immediate area of the cuts indicates that these rocks have a velocity of about 2500 ft per second (f/s) within the outer 10 ft (in the horizontal or vertical direction), and a velocity of about 5000 f/s further into the rock to a penetration depth of about 35 ft. The velocity increases to about 11,000 f/s beyond about 35 ft depth. These velocities, together with the structure of the rock, indicate that the approximate outer ten ft of rock is considered easily ripped by a Caterpillar D9 series tractor, or equivalent, with a single-tooth ripper, according to conservative Caltrans standards (McNaughton and Owen, 2016). By the same piece of equipment and the same conservative standards, the rock between about 10 and 35 ft of penetration is considered difficult to rip. According to less conservative standards published by Caterpillar (2000), this deeper layer (~ 10 to 35 ft) is rippable by the same piece of equipment. Since no portion of the relatively small cut area penetrates deeper than about 9 ft, it is highly likely that all rock encountered during excavation will be easily ripped, though the possibility exists that a small amount of rock at the deepest portions of excavation may be moderately difficult to rip. Blasting is not required.

OGDN recommends an earthwork grading factor of 1.15 for this ultramafic material.

Approximate Station Interval 56+04 to 62+50 (East of Bridge)

Cuts up to 40 ft in height are proposed east of the bridge (up station) in both the south facing slopes north of the highway from station 56+04 to 62+50. These cuts are in material mapped as undifferentiated mélangé of the Shoo Fly Formation by Saucedo and Wagner (1992). Field observations indicate that the existing south-facing cut slope east of the bridge, which has a slope ratio varying from 1.5:1 to 1:1, has two bands of breccia conglomerate at slight angles across part of the middle to upper slope, within a reddish sandy clay matrix that extends to the bottom of the slope. Andesitic cobbles and boulders are scattered on the gently sloping surface above the hinge point of the slope. Further east, where the existing cut is highest, the material consists of gravel to cobble sized clasts of andesite, chert, and possibly even greenstone, in a distinctly yellow to almost white silt to clay matrix, with some areas being red to red brown. Existing cut slopes south of the highway are composed of the same general matrix material, minus a considerable portion of the clasts.

Our Office recommends cut slope ratios of 1.5:1 where project constraints allow. These slope ratios provide stability and are not prone to any surficial sloughing. In those areas where right-of-way and archaeological (such as the historic trail located atop the existing south facing cut) constraints limit design, 1:1 cut slope ratios may be used without risking deep instability, but, in those areas where existing 1:1 cut slopes are known to undergo surficial sloughing during particularly wet winters (according to maintenance), similar behavior can be expected.

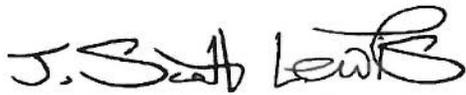
The material in all of these eastern cut slopes is easily ripped.

Our Office recommends a grading factor of 0.92 for material excavated from these eastern slopes.

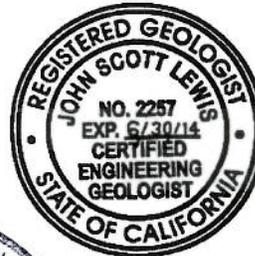
Fills

Fills were not originally planned for this project, but late changes due to NOA disposal issues have resulted in the addition of a fill less than east of the bridge on the south side of the highway. Our Office recommends fill slope ratios of 1:1 for the rocky material obtained from the west end of the bridge, provided the material is compacted (at least two passes with a sheepsfoot compactor) and the fill does not exceed 20 ft in height. OGDN recommends that fills constructed from material excavated from slopes east of the bridge be constructed at ratios of 1.5:1 or flatter.

This completes the scope of services requested at this time. If you have any questions or comments, please call Mr. Lewis at (530) 225-3516.



J. SCOTT LEWIS, P.G., C.E.G., R.G.P.
Associate Engineering Geologist
Office of Geotechnical Design North



SHAWN WEI, P.E.
Senior Transportation Engineer
Office of Geotechnical Design North



ec: Deena Matagulay
Thomas Penick
Byron Berger- D02 Materials Lab
OGDN File-<http://svgcgeodog.dot.ca.gov/>

REFERENCES

Barrie, A., March 28, 2002, Addendum to PGR Report for APS-Spring Garden Bridge and Overhead, Spring Garden (Rehab/Replace) Bridge No. 02-0062, PLU 70-KP 82.4, 02-308800.

Barrie, A., March 12, 2002, Preliminary Geology Recommendations, Spring Garden (Rehab/Replace) Bridge No. 02-0062, PLU 70-KP 82.4, 02-308800.

California Department of Transportation, Division of Maintenance GIS in coordination with Department of Environmental Analysis (2004), District 2 Areas Likely to Contain Asbestos, Map.

California Department of Conservation, Division of Mines and Geology, 2000, General Location Guide for Ultramafic Rocks in California - Areas Likely to Contain Naturally Occurring Asbestos, 2000, Map scale 1:1,100,000, Open-File Report 2000-19

Caterpillar Handbook of Ripping, 12th Edition. (2000)

Lewis, S., July 28, 2009, District Preliminary Geotechnical Report, Spring Garden (Rehab/Replace) Bridge No. 02-0062, PLU 70-PM 50.3/53.0.

McNaughton, S, and Owen, W.P., 2016, Results of seismic refraction survey at Spring Garden Bridge Replacement

Saucedo, G.J., and Wagner, D.L., 1992, Geologic Map of the Chico Quadrangle, California, California Division of Mines and Geology, Scale 1:250,000.

United States Geological Survey (USGS), 1994, Spring Garden Quadrangle, 7.5 minute series (topographic).

For Contract No. 02-2C0904

MATERIALS INFORMATION

Water Source Information

Identified non-potable water source

1) Indian Valley Community Services District

Source: Round Valley Reservoir

P.O. Box 899

127 Crescent Street Suite #1

Greenville, California

95947-0899

Contact: Jeff Titcomb, Office Manager, (530) 284-7224

<http://www.indianvalleycsd.com/home.htm>

Identified Potential water source

2) East Quincy Services District

179 Rogers Avenue

Quincy, CA 95971

Contact: Mike Green, General Manager (530) 283-2390

<http://www.eastquincycsd.com/>