

# **REQUEST FOR QUALIFICATIONS AND REQUEST FOR PROPOSAL**

## **For**

## **A DESIGN-BUILD ENTITY (D-BE)**

**for**  
**THE GRAEAGLE CREEK PEDESTRIAN BRIDGE  
PROJECT**

Request for Proposal No: RFQP 2022

Issue Date: January 1, 2023

The Graeagle Community Services District (GCSD) is interested in obtaining prices, including delivery, abutment construction and bridge erection of a 160' long by 8' wide pedestrian bridge at the Graeagle Mill Pond site. Please furnish your proposal specifying your lump sum price, freight and tax within the Fee Schedule item described on page 14.

Bids for supplying engineering staff (construction supervisor) to the project site are to be good for a period ending December 31, 2023. Please furnish your bid specifying your hourly rate of compensation all labor, subsistence costs, travel costs, profit and overhead.

**Closing Date for Submission:**

Proposals must be received at the address below by 2:00 p.m., January 31, 2023 (the "Closing Time"). Email submissions are not authorized. Proposals received after the time and date specified above will be considered nonresponsive and will be returned to the D-BE.

**Submission:**

This RFP does not commit the Graeagle Community Services District (GCSD) to award a contract, to pay any costs incurred in the preparation of a proposal for this request, or to procure or contract for services. The GCSD reserves the right to accept or reject any or all proposals received because of this request, to negotiate with any qualified D-BE, or to modify or cancel in part or in its entirety the RFP if it is in the best interests of the GCSD to do so. Furthermore, a contract award may not be made based solely on price.

The prospective D-BE is advised that should this RFP result in a recommendation for award of a contract, the contract will not be in force until it is approved and fully executed by the GCSD.

The submissions should be marked “**Request for Qualifications and Request for Proposal for the Graeagle Creek Pedestrian Bridge Project**”, provided in three (3) hard copies and one (1) pdf copy, and sent to:

**Attention: Christopher Ruedy**  
Graeagle Community Service District  
P.O. Box 1414  
Graeagle CA 96103

**Anticipated Contract Term:**

We expect that the Selected firm, if any, will be chosen by February 28, 2023.

**RFQP Acknowledgment Form:** If you are interested in proposing, please return by email the acknowledgment form, attached in Appendix A, upon receipt of the RFP. This helps ensure that Addendums, if any, are transmitted efficiently.

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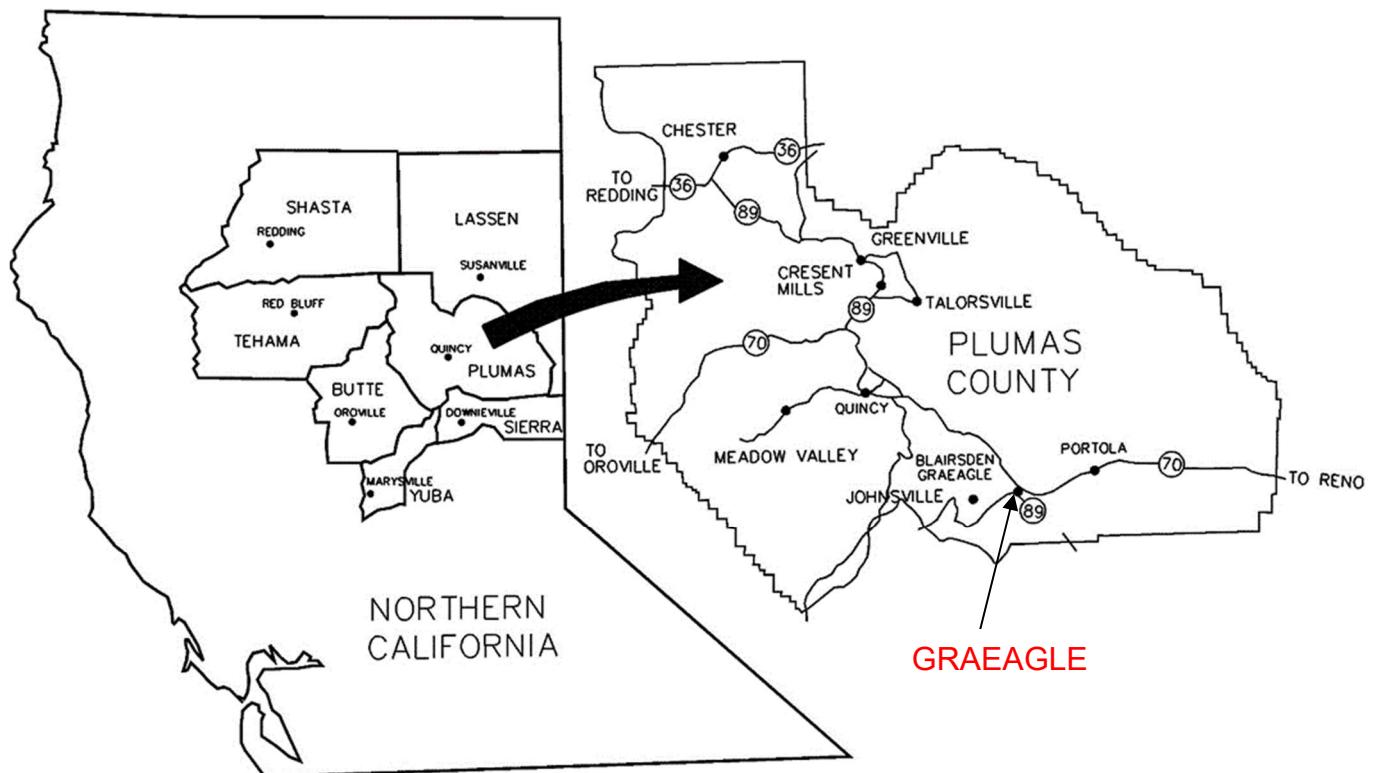
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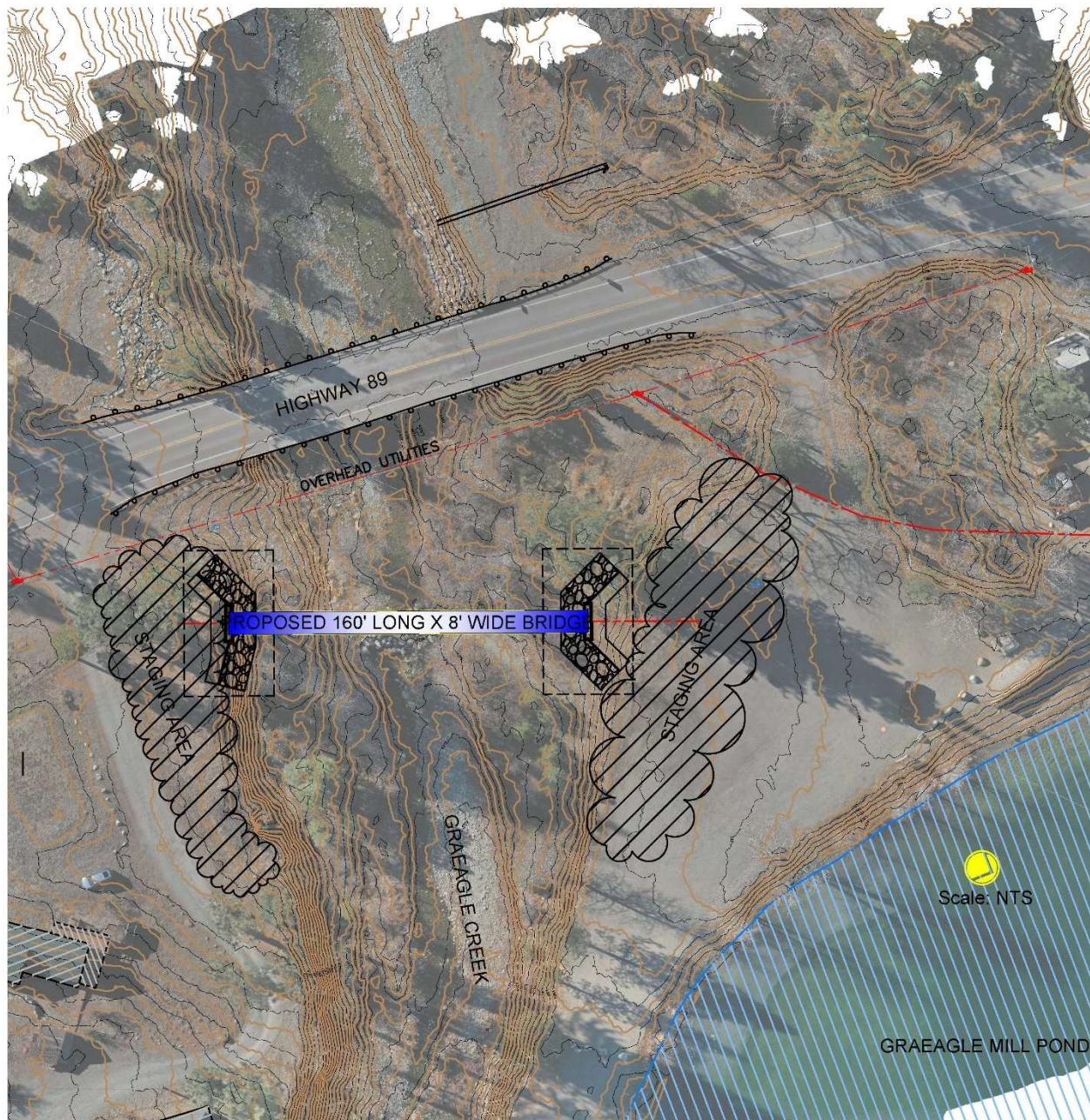
## Purpose and Background

In this Request for Qualifications and Proposals ("RFQP"), the Graeagle Community Services District ("GCSD") is soliciting statements of qualification (each, a "SOQ") and proposals (each, a "Proposal") from a qualified **Design-Build Entity (D-BE)** to provide engineering and construction services (the "Services") for the Graeagle Creek Pedestrian Bridge Project ("Project"). GCSD is proposing to build a pedestrian bridge to span Graeagle Creek (see Figure 2).

*Figure 1 - Regional Map*



*Figure 2 - Vicinity Map*

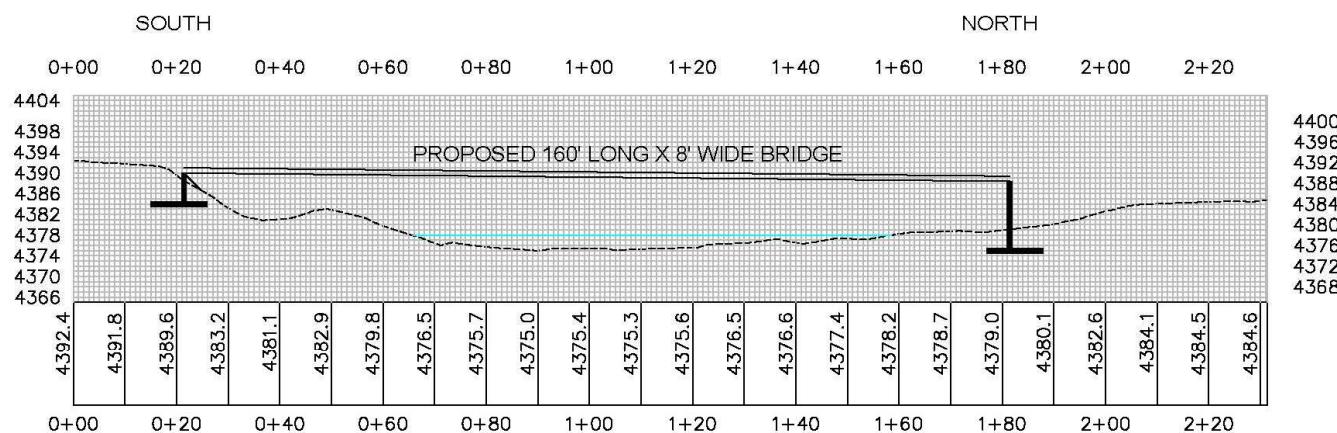


## VICINITY MAP FOR GRAEAGLE CREEK PEDESTRIAN BRIDGE

PREPARED BY: BASTIAN ENGINEERING  
RCE 45489, LS 7045

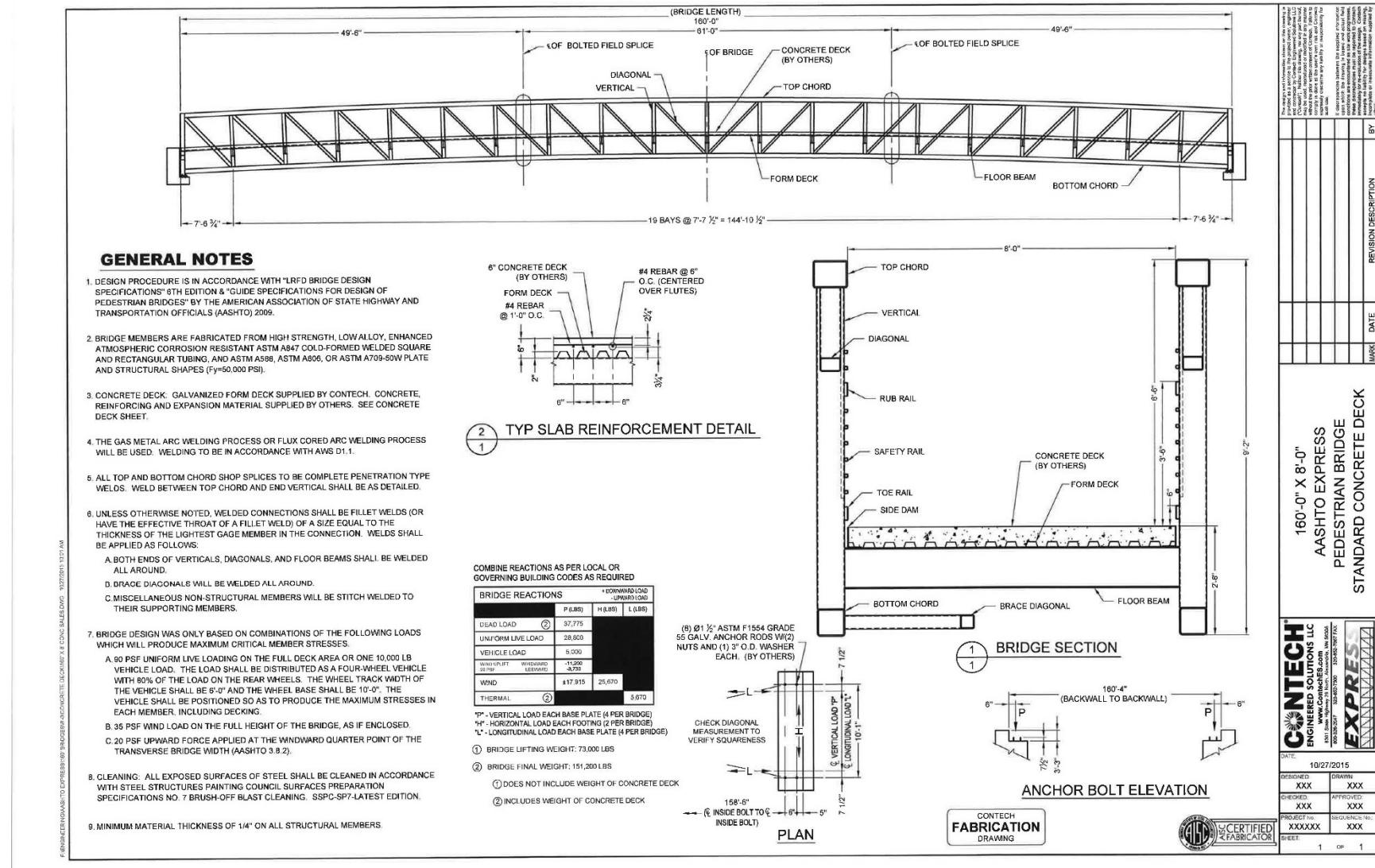
*Figure 3 - Profile*

Scale: NTS



## PROPOSED BRIDGE CROSS SECTION FOR GRAEAGLE CREEK PEDESTRIAN BRIDGE

*Figure 4 - Sample Bridge (Used by permission. This drawing is a sample only and not specific to this project. The drawing is intended to give the proposer a general idea of the bridge type and configuration)*



# Aesthetic Design Objectives

## Bridge

While quality of development is important in all resort communities, Graeagle's location makes it essential that the quality of the bridge strives to match the quality of its spectacular natural environment. A primary goal of the GCSD is to preserve and build upon Graeagle's unique community character and an insistence on design quality, sensitivity, and compatibility for new development. All aspects of design shall reflect the community's special significance.

Generally desirable design traits include symmetrical span arrangements, cambered bridge deck, and orientation of substructure units aesthetically consistent with the overall bridge layout. Aesthetics of the bridge must reflect:

1. Use of natural colors that complement the surrounding natural environment (i.e., weathered steel).
2. The bridge will be accessible to a variety of users and approaches should function as barrier-free and ADA compliant. Removable entrance and exit bollards are required to limit vehicle access.
3. The structure should be designed to complement the views in the natural environment and every effort made to ensure it appears as an extension of the natural landscape to minimize environmental impacts, mitigate visual and aesthetic impacts on significant sightlines and views.
4. The structure above the walking surface/deck elevation should be minimized, while mandating ADA compliance.
5. Structure should be designed to be in keeping with the natural environment to respect the natural character and quality of the surrounding landscapes.
6. Structure to be located approximately 4' above the base flood elevation.

## Budget

1. The GCSD has a preliminary budget \$700,000 to complete the Project. GCSD may not entertain any proposals that exceed this budget.
2. Providing the base pricing is compliant with the basic requirements in the RFP, proposals may suggest potential additions or changes to the proposal (with associated cost impacts).

## Quality Control

1. Prior to the start of fabrication, the selected firm shall submit a comprehensive Quality Control Program including, but not necessarily limited to the following:
  - a. Procurement of materials including quality assurance programs of major suppliers.

- b. Fabrication of components.
  - c. Final assembly of components.
  - d. Installation and site quality control.
2. The quality control programs submitted are subject to review by the GCSD.
  3. All quality control programs shall allow for a sufficient sampling to ensure certainty of conformance with the Contract.
  4. The GCSD shall be allowed access to all fabricator's facilities and those of major suppliers to monitor quality control procedures. The Selected firm shall make available all quality control program records upon request.
  5. The selected firm must supply or reference specifications to the principal components of the proposal.

## Environmental Objectives

### **Bridge**

1. Consideration of the environmental impacts during construction is paramount. In addition to the Mitigation Monitoring and Reporting Program (Appendix C) and the Avoidance and Minimization Measures noted in the Stream Alteration Permit (see Appendix D), designs should consider:
  - a. No in-stream work.
  - b. Plan and take steps to prevent material from entering the creek, and creek water from entering the excavation when installing both abutments,
  - c. Eliminating changes to the bank lines, except at the abutments.
  - d. The source of primary materials for bridge.
  - e. Minimizing the need for dewatering.
  - f. Preserve vegetation.
  - g. Conduct California Fish and Wildlife Protocol surveys noted in the Monitoring and reporting Mitigation Measures (see Appendix C)
2. Considerations of the environmental impacts with the long-term operation of the bridge are also of key importance. Consideration should be given to:
  - a. An operational working method or design that will avoid materials falling/washing into the creek below during maintenance.
  - b. An operational working method or design that will avoid snow melt, drip and removal materials falling/washing into the creek below during maintenance.
  - c. Operation and maintenance costs are to be minimized as far as possible whilst maintaining the intent of the design.
3. The selected DB-E firm will be required to demonstrate environmental considerations in the design, construction, and life cycle maintenance of the structure. With these considerations and working methods, the selected firm will be required to work closely with the GCSD, and Respondents should be aware of the interconnectivity of the CEQA process with both design and construction.

The Respondent must make allowance for this in its proposal price.

4. To the extent required to adhere to the conditions of the environmental document, notwithstanding any other provision of this RFP, the selected firm hereby provides its consent for the use, and disclosure, of all information provided to the GCSD about this RFP, including its proposal.

## **Project Schedule**

The following table summarizes expected project milestones

<b>Milestone</b>	<b>Anticipated Completion Date</b>
RFP Issued	1/1/2023
Closing Date for Proposal Submission	1/31/2023
Contract Award (if any)	3/15/2023
Detailed Project Schedule Submission	4/15/2023
50% Design Drawings with GCSD Approval	5/15/2023
90% Design Drawings and GCSD Approval Drawings	7/1/2023
GCSD Design Drawing Approval	7/15/2023
Plumas County Grading/Misc. Permit Submittal	8/1/2023
Estimated Plumas County Permit Approval	8/15/2023
Estimated Plumas County Engineering Approval of the Flood Study	TBD
A Willow Flycatcher Survey Protocol for California shall be completed before operations begin to determine if Willow Flycatcher are present (WIFL)	7/31/2023

Milestone	Anticipated Completion Date
Conduct a minimum of three (3) amphibian surveys during July and August between the hours of 10 am and 4 pm in good weather. Surveys will be conducted using Amphibian VES protocols. Protocols referenced are “California Department of Fish and Game (2010) HML-Fish/Amphibian Survey Protocols. Pp. 6-8”); and “Fellers GM, Freel KL (1995) A Standardized Protocol for Surveying Aquatic Amphibians, United States Department of Interior and the University of California.”	7/31/2023 - 8/15/2023
Construction begins, Staking and Erosion Control Measures	9/1/2023
Foundation and Abutment Construction	9/30/2023
Procurement and Bridge Shop Fabrication	7/30/2023
Construction Completion	10/30/2023

## **General Scope of Services**

The Services include, but are not limited to the following tasks:

- Provide Construction Administration.
- Design/Preparation of Construction Documents.
- Obtain Building Permit(s) (abutments and bridge).
- Implement/Oversee Environmental Mitigations.
- Implement Stormwater Water Pollution Plan and Mitigations.
- Procure/Conduct Willow Fly Catcher and Amphibian Surveys.
- Provide Local, State and Federal Permit Liaison.
- Provide Construction Inspection.
- Procure/Provide Construction Testing.
- Provide Construction Management and Supervision.
- Construct Abutments.
- Procure Bridge, install and provide all construction appurtenances
- Provide “As-Built” documents.

County/State/Federal fees to be paid directly by GCSD.

All work shall be performed under the direction of an appropriately licensed

professional engineer and contractor registered with the State of California. No subcontractors shall be utilized without prior authorization by the District.

Service of Work requires completion and GCSD approval for items noted below to process progress payments:

ITEM	50%	90%	100%
Construction Documents	✓	✓	✓
Complete Stamped and Signed DB Construction Documents			✓
Permits			✓
Environmental Mitigations			✓
Inspection			
Construction Supervision and Management			
Bridge and Installation	✓	✓	✓
Abutment Construction	✓	✓	✓
As-Built Drawings			✓

Data and Materials to be provided by the Graeagle Community Services District:

- Existing Site Map and Approximate Underground Utility Locations
- Snow Load Data
- Geotechnical Report
- County Approved Flood Study
- Bridge Design Guidelines/Specifications
- DFW Stream Alteration Permit
- Army Corps of Engineers Preliminary Jurisdictional Determination (JD) for the Graeagle Pedestrian Bridge site.
- California Environment Quality Act Negative Declaration

# **Statement of Qualifications**

Please provide the District with a statement of qualifications("SOQ") that includes the following:

- A comprehensive five-year summary of the firm's litigation, arbitration, and negotiated/settled history with previous clients. State the issues in the litigation, the status of the litigation, names of parties, and outcome.

# **Fee Schedule & Proposal**

Please provide a proposal ("Proposal") setting forth the following:

- Any comments or objections to the form of agreement attached to this RFQP ("Form of Agreement") **PLEASE NOTE: The District will not consider any substantive changes to the Form of Agreement if they are not submitted at or before this time.**
- A narrative setting forth the proposed scope of work.
- Resumes of proposed personnel.
- Samples of reporting capabilities/methodologies.
- A proposed not to exceed total compensation amount broken down into phases, as well as an hourly fee schedule pursuant to which total compensation is to be computed.
- All costs, expenses, or other charges that the D-BE firm would charge the District in addition to your firm's fee.

# **Project Schedule**

Pre-Proposal Meeting & Walk Through: 1/16/2023

Deadline for Questions: 1/23/2023

Due Date for SOQ and Proposals: 1/31/2023

# **Proposal Submittal**

One (1) original, five (5) hard copies and one (1) electronic copy of a written proposal must be delivered by January 31, 2023, to:

Attn: Christopher Ruedy  
P.O. Box 1414, Graeagle CA 96103  
Graeagle Community Service District  
Email: [CSD96103@yahoo.com](mailto:CSD96103@yahoo.com)  
Phone: 480-620-7854

Any/All questions shall be submitted to the District in writing to [CSD96103@yahoo.com](mailto:CSD96103@yahoo.com).

**Please submit your SOQ and Proposal to the District by 5:00 p.m., January 31, 2023** Proposals received after this time and date may be returned unopened. Postmarks will not be accepted as proof of receipt.

Proposers assume the risk of the method of delivery chosen. The District assumes no responsibility for delays caused by any delivery service.

# ATTACHMENT 1

## GCSD Services Sample Agreement

### **1. PARTIES AND DATE.**

This Agreement is made and entered into as \_\_\_\_\_, 20\_\_ by and between the Graeagle Community Service District, a public agency organized and operating under the laws of the State of California with its principal place of business at [District Address] ("District"), and [\*\*\*INSERT NAME\*\*\*], a [\*\*\*INSERT TYPE OF ENTITY - CORPORATION, PARTNERSHIP, SOLE PROPRIETORSHIP OR OTHER LEGAL ENTITY\*\*\*] with its principal place of business at [\*\*\*INSERT ADDRESS\*\*\*] (hereinafter referred to as "D-BE"). District and D-BE are sometimes individually referred to herein as "Party" and collectively as "Parties."

### **2. RECITALS.**

2.1 District. District is a public agency organized under the laws of the State of California, with power to contract for services necessary to achieve its purpose.

2.2 Design – Build Entity (D-BE). D-BE desires to perform and assume responsibility for the provision of certain professional design and construction services required by the District on the terms and conditions set forth in this Agreement. D-BE warrants that it is fully licensed, qualified, and willing to perform the services required by this Agreement; provided, however, that if D-BE is a corporation or other organization, the Project consultant designated pursuant to Section 3.2, and not the D-BE itself, shall be fully licensed to practice as an architect and/or engineer in the State of California.

2.3 Project. District desires to engage D-BE to render such services for the [INSERT PROJECT NAME] ("Project") as set forth in this Agreement.

### **3. TERMS**

#### **3.1 Employment of D-BE.**

3.1.1 Scope of Services. D-BE promises and agrees to furnish to District all labor, materials, tools, equipment, services, and incidental and customary work necessary to fully and adequately supply the services necessary for the full and adequate completion of the Project consistent with the provisions of this Agreement (hereinafter referred to as "Services"). The Services are more particularly described throughout this Agreement, including Exhibit "A" attached hereto and incorporated herein by reference. All Services shall be subject to, and performed in accordance with, this Agreement, any exhibits attached hereto and incorporated herein by reference, and all applicable local, state and federal laws, rules and regulations. All Services performed by D-BE shall be subject to the sole and discretionary approval of the District, which approval shall not be unreasonably withheld.

Term.

The term of this Agreement shall be from [INSERT DATE] to [INSERT DATE], unless earlier terminated as provided herein. [... **INSERT THE FOLLOWING SENTENCE FOR MULTI-YEAR, AUTOMATIC RENEWAL NOT TO EXCEED THREE CONSECUTIVE YEARS; OTHERWISE, ALWAYS DELETE:** The District shall have the unilateral option, at its sole discretion, to renew this Agreement for no more than [INSERT NUMBER] additional one-year terms. D-BE shall complete the Services within the term of this Agreement and shall meet any other established schedules and deadlines.

### **3.2 Key Personnel.**

**3.2.1** Engineering Project Lead (“Project Lead”). D-BE shall name a specific individual to act as Project Lead, subject to the approval of District. D-BE hereby designates (**INSERT NAME OF INDIVIDUAL CONSULTANT**) (License No. **[INSERT NUMBER]**) to act as the Project Lead for the Project. The Project Lead shall: (1) maintain oversight of the Services; (2) have full authority to represent and act on behalf of the D-BE for all purposes under this Agreement; (3) supervise and direct the Services using his or her best skill and attention; (4) be responsible for the means, methods, techniques, sequences and procedures used for the Services; (5) adequately coordinate all portions of the Services; and (6) act as principal contact with District and all contractors, D-BEs, engineers and inspectors on the Project. Any change in the Project D-BE shall be subject to the District's prior written approval, which approval shall not be unreasonably withheld. The new Project D-BE shall be of at least equal competence as the prior Project D-BE. If District and D-BE cannot agree as to the substitution of a new Project Consultant, District shall be entitled to terminate this Agreement for cause.

**3.2.2 Key Personnel.** In addition to the Project Lead, D-BE has represented to the District that certain additional key personnel, engineers and consultants will perform the Services under this Agreement. Should one or more of such personnel, engineers or consultants become unavailable, D-BE may substitute others of at least equal competence upon written approval of the District. If District and Lead cannot agree as to the substitution of key personnel, engineers or consultants, District shall be entitled to terminate this Agreement for cause. As discussed below, any personnel, engineers or consultants who fail or refuse to perform the Services in a manner acceptable to the District, or who are determined by the District to be uncooperative, incompetent, a threat to the adequate or timely completion of the Project or a threat to the safety of persons or property, shall be promptly removed from the Project by the D-BE at the request of the District. The key additional personnel, engineers, and consultants for performance of this Agreement are as follows: **[INSERT NAMES, AND TITLES OF KEY PERSONNEL, AND LICENSE NUMBERS, IF APPLICABLE].**

### **3.3 Hiring of Consultants and Personnel.**

3.3.1 Right to Hire or Employ. D-BE shall have the option, unless District objects in writing after notice, to employ at its expense architects, engineers, experts or other consultants qualified and licensed to render services in connection with the planning and/or administration of the Project, and to delegate to them such duties as D-BE may delegate without relieving D-BE from administrative or other responsibility under this Agreement. D-BE shall be responsible for the coordination and cooperation of consultants architects, engineers, experts, or other consultants. All consultants, including changes in consultants, shall be subject to approval by District in its sole and reasonable discretion. D-BE shall notify District of the identity of all consultants at least fourteen (14) days prior to their commencement of work to allow District to review their qualifications and approve to their participation on the Project in its sole and reasonable discretion.

3.3.2 Qualification and License. All architects, engineers, experts, and other consultants retained by D-BE in performance of this Agreement shall be qualified to perform the Services assigned to them and shall be licensed to practice in their respective professions, where required by law.

3.3.3 Standards and Insurance. All architects, engineers, experts, and other consultants hired by D-BE shall be required to meet all of the same standards and insurance requirements set forth in this Agreement, unless other standards or requirements are approved by the District in writing. Unless changes are approved in writing by the District, D-BE's agreements with its consultants shall contain a provision making them subject to all provisions stipulated in this Agreement.

3.3.4 Assignments or Staff Changes. D-BE shall promptly obtain written District approval of any assignment, reassignment or replacement of such architects, engineers, experts, and consultants, or of other staff changes of key personnel working on the Project. As provided in the Agreement, any changes in D-BE's consultants and key personnel shall be subject to approval by District.

3.3.5 Draftsman and Clerical Support. Draftsmen and clerical personnel shall be retained by D-BE at D-BE's sole expense.

### **3.4 Standard of Care.**

3.4.1 Standard of Care. D-BE shall perform all Services under this Agreement in a skillful and competent manner, consistent with the standards generally recognized as being

employed by professionals qualified to perform the Services in the same discipline in the State of California and shall be responsible to District for damages sustained by the District and delays to the Project as specified in the indemnification provision of this Agreement. Without limiting the foregoing, D-BE shall be fully responsible to the District for any increased costs incurred by the District as a result of any such delays in the design or construction of the Project. D-BE represents and maintains that it is skilled in the professional calling necessary to perform the Services. D-BE warrants and represents that all of its employees, architects, engineers, experts and other consultants shall have sufficient skill and experience to perform the Services assigned to them. Finally, D-BE represents that it, its employees, architects, engineers, experts and other consultants have all licenses, permits, qualifications and approvals of whatever nature that are legally required to perform the Services assigned to or rendered by them and that such licenses and approvals shall be maintained throughout the term of this Agreement. As provided for in the indemnification provisions of this Agreement, D-BE shall perform, at its own cost and expense and without reimbursement from the District, any services necessary to correct errors or omissions which are caused by the D-BE's failure to comply with the standard of care provided for herein.

3.4.2 Performance of Employees. Any employee or consultant who is determined by the District to be uncooperative, incompetent, a threat to the adequate or timely completion of the Project, a threat to the safety of persons or property, or any employee or consultant who fails or refuses to perform the Services in a manner acceptable to the District, shall be promptly removed from the Project by the D-BE and shall not be re-employed to perform any of the Services or to work on the Project.

#### **4. Laws and Regulations.**

4.1.1 Knowledge and Compliance. D-BE shall keep itself fully informed of and in compliance with all applicable local, state, and federal laws, rules and regulations in any manner affecting the performance of the Services or the Project and shall give all notices required of the D-BE by law. D-BE shall be liable, pursuant to the standard of care and indemnification provisions of this Agreement, for all violations of such laws and regulations in connection with its Services. If the D-BE performs any work knowing it to be contrary to such laws, rules and regulations, D-BE shall be solely responsible for all costs arising therefrom. D-BE shall defend, indemnify, and hold District, its officials, officers, employees and agents free and harmless, pursuant to the indemnification provisions of this Agreement, from any claim or liability arising out of any failure or alleged failure to comply with such laws, rules or regulations.

4.1.2 Americans with Disabilities Act. D-BE will use its best professional efforts to interpret all applicable federal, state, and local laws, rules and regulations with

respect to access, including those of the Americans with Disabilities Act ("ADA"). D-BE shall inform District of the existence of inconsistencies of which it is aware or reasonably should be aware between federal and state accessibility laws, rules, and regulations, as well as any other issues which are subject to conflicting interpretations of the law and shall provide the District with its interpretation of such inconsistencies and conflicting interpretations. Unless D-BE brings such inconsistencies and conflicting interpretations to the attention of the District and requests District's direction on how to proceed, the D-BE's interpretation of such inconsistencies and conflicting interpretations shall be the sole responsibility and liability of D-BE, and the D-BE shall correct all plans, specifications and other documents prepared for the Project at no additional cost if its interpretations are shown to be incorrect. In the event that the D-BE request's District's direction on how to proceed with respect to any inconsistent and/or conflicting interpretation, the D-BE shall be responsible to the District only pursuant to the indemnification provisions of this Agreement.

**4.1.3 Permits, Approvals and Authorizations.** D-BE shall oversee all permits, approvals or other authorizations required for the Project from all federal, state, or local governmental bodies with approval jurisdiction over the Project. The costs of permits, approvals and other authorizations shall be paid by the District.

**4.1.4 Water Quality Management and Compliance.**

Compliance with Water Quality Laws, Ordinances and Regulations. D-BE shall keep itself and all subcontractors, staff, and employees fully informed of and in compliance with all local, state and federal laws, rules and regulations that may impact, or be implicated by the performance of the Services including, without limitation, all applicable provisions of the District's ordinances regulating water quality and storm water; the Federal Water Pollution Control Act (33 U.S.C. § 1251 *et seq.*); the California Porter-Cologne Water Quality Control Act (Cal Water Code §§ 13000-14950); and any and all regulations, policies, or permits issued pursuant to any such authority. D-BE shall additionally comply with the lawful requirements of the District, and any other municipality, drainage district, or other local agency with jurisdiction over the location where the Services are to be conducted, regulating water quality and storm water discharges.

(a) Standard of Care. D-BE warrants that all employees and subcontractors shall have sufficient skill and experience to perform the work assigned to them without impacting water quality in violation of the laws, regulations and policies described above in this Agreement. D-BE further warrants that it, its employees, and subcontractors will receive adequate training, as determined by the District, regarding these requirements as they may relate to the Services.

(b) Liability for Non-compliance.

(i) Indemnity: Failure to comply with laws, regulations, and ordinances listed in Sections in 3.5 of this Agreement is a violation of federal and

state law. Notwithstanding any other indemnity contained in this Agreement, D-BE agrees to indemnify and hold harmless the District, its officials, officers, agents, employees and authorized volunteers from and against any and all claims, demands, losses or liabilities of any kind or nature which the District, its officials, officers, agents, employees and authorized volunteers may sustain or incur for noncompliance with the laws, regulations, and ordinances listed above, arising out of or in connection with the Services, except for liability resulting from the sole established negligence, willful misconduct or active negligence of the District, its officials, officers, agents, employees or authorized volunteers.

(ii) Defense: District reserves the right to defend any enforcement action or civil action brought against the District for D-BE's failure to comply with any applicable water quality law, regulation, or policy. D-BE hereby agrees to be bound by, and to reimburse the District for the costs associated with, any settlement reached between the District and the relevant enforcement entity.

(iii) Damages: District may seek damages from D-BE for delay in completing the Services caused by D-BE's failure to comply with the laws, regulations and policies described in Sections 3.5 of this Agreement, or any other relevant water quality law, regulation, or policy.

#### **4.4 Independent Contractor.**

4.4.1 Control and Payment of Subordinates. District retains D-BE on an independent contractor basis and D-BE is not an employee of District. D-BE is not an employee for state tax, federal tax, or any other purpose, and is not entitled to the rights or benefits afforded to District's employees. Any additional personnel performing the Services under this Agreement on behalf of D-BE shall also not be employees of District and shall always be under D-BE's exclusive direction and control. D-BE shall pay all wages, salaries, and other amounts due such personnel in connection with their performance of Services under this Agreement and as required by law. D-BE shall be responsible for all reports and obligations respecting such additional personnel, including, but not limited to social security taxes, income tax withholding, unemployment insurance, disability insurance, and workers' compensation insurance.

#### **4.5 Schedule of Services.**

4.5.1 D-BE Services. D-BE shall fully and adequately complete the Services described in this Agreement and in Exhibit "A" attached hereto and incorporated herein by reference.

4.5.2 Timely Performance Standard. D-BE shall perform all Services hereunder as expeditiously as is consistent with professional skill and care, as well as the

orderly progress of the Project work so as not to be the cause, in whole or in part, of delays in the completion of the Project or in the achievement of any Project milestones, as provided herein. Specifically, D-BE shall perform its Services to allow for the full and adequate completion of the Project within the time required by the District and within any completion schedules adopted for the Project. D-BE agrees to coordinate with District's staff and consultants in the performance of the Services, and shall be available to District's staff and consultants at all reasonable times.

**4.5.3 Performance Schedule.** D-BE shall prepare an estimated time schedule for the performance of D-BE's Services, to be adjusted as the Project proceeds. Such schedule shall be subject to the District's review and approval, which approval shall not be unreasonably withheld, and shall include allowances for periods of time required for District's review and approval of submissions, and for approvals of authorities having jurisdiction over Project approval and funding. If District and D-BE cannot mutually agree on a performance schedule, District shall have the authority to immediately terminate this Agreement. The schedule shall not be exceeded by D-BE without the prior written approval of District. If the D-BE's Services are not completed within the time provided by the agreed upon performance schedule, or any milestones established therein, it is understood, acknowledged, and agreed that the District will suffer damage for which the D-BE will be responsible pursuant to the indemnification provision of this Agreement.

**4.5.4 Excusable Delays.** Any delays in D-BE's work caused by the following shall be added to the time for completion of any obligations of D-BE: (1) the actions of District or its employees; (2) the actions of those in direct contractual relationship with District; (3) the actions of any governmental agency having jurisdiction over the Project; (4) the actions of any parties not within the reasonable control of the D-BE; and (5) any act of God or other unforeseen occurrence not due to any fault or negligence on the part of D-BE. Neither the District nor the D-BE shall be liable for damages, liquidated or otherwise, to the other on account of such delays.

**4.5.5 Request for Excusable Delay Credit.** The D-BE shall, within fifteen (15) calendar days of the beginning of any excusable delay, notify the District in writing of the causes of delay (unless District grants in writing a further period to file such notice prior to the date of final payment under the Agreement). District will then ascertain the facts and the extent of the delay and grant an extension of time for completing the Services when, in its sole judgment, the findings of fact justify such an extension. The District's findings of fact thereon shall be final and conclusive on the parties. Extensions of time shall apply only to that portion of the Services affected by the delay and shall not apply to other portions of the Services not so affected. The sole remedy of D-BE for extensions of time shall be an extension of the performance time at no cost to the District. If Additional Services are required because of an excusable delay, the parties shall mutually agree thereto pursuant to the Additional Services provision of this Agreement. Should D-BE make an application for an extension of time, D-BE shall submit evidence that the insurance policies required by this Agreement remain in effect during the requested

additional period of time.

4.5.6     Additional D-BE Services. Request for Services. At District's request, D-BE may be asked to perform services not otherwise included in this Agreement, not included within the basic Services listed in Exhibit "A" attached hereto, and/or not customarily furnished in accordance with generally accepted design practice.

4.5.7     Definition. As used herein, "Additional Services" mean: (1) any work which is determined by District to be necessary for the proper completion of the Project, but which the parties did not reasonably anticipate would be necessary for the D-BE to perform at the execution of this Agreement; or (2) any work listed as Additional Services in Exhibit "A" attached hereto. D-BE shall not perform, nor be compensated for, Additional Services without prior written authorization from District and without an agreement between the District and D-BE as to the compensation to be paid for such services. District shall pay D-BE for any approved Additional Services, pursuant to the compensation provisions herein, so long as such services are not made necessary through the fault of D-BE pursuant to the indemnification provision of this Agreement.

4.5.8     Examples of Additional Services. Such Additional Services shall not include any redesign or revisions to drawings, specifications, or other documents when such revisions are necessary in order to bring such documents into compliance with applicable laws, rules, regulations or codes of which D-BE was aware or should have been aware pursuant to the laws and regulations provision of this Agreement above. Such Additional Services may include, but shall not be limited to:

      (a)    Separately Bid Portions of Project. Plan preparation and/or administration of work on portions of the Project separately bid.

      (b)    Inconsistent Approvals or Instructions. Revisions in drawings, specifications, or other documents when such revisions are inconsistent with written approvals or instructions previously given and are due to causes beyond the control of D-BE.

      (c)    Legal Proceedings. Serving as an expert witness on District's behalf or attending legal proceedings to which the D-BE is not a party.

      (d)    Damage Repair. Supervision of repair of damages to any structure.

      (e)    Extra Environmental Services. Additional work required for environmental conditions (e.g., site conditions) not already contemplated within the D-BE's services for the Project.

4.6        **District Responsibilities.** District's responsibilities shall include the following:

4.6.1      Data and Information. District shall make available to D-BE all necessary data and information concerning the purpose and requirements of the Project, including scheduling and budget limitations, objectives, constraints, and criteria. As part of the budget limitation information, the District shall provide the D-BE with a preliminary construction budget ("District's Preliminary Construction Budget").

4.6.2      Project Survey and staking. If required pursuant to the scope of the Project and if requested by D-BE, District shall furnish D-BE with, or direct D-BE to procure at District's expense, a survey of the Project site prepared by a registered surveyor or civil engineer, any other record documents which shall indicate existing structures, land features, improvements, sewer, water, gas, electrical and utility lines, topographical information and boundary dimensions of the site, and any other such pertinent information.

4.6.3      Fees of Reviewing or Licensing Agencies. Directly pay or reimburse the payment of all fees required by any reviewing or licensing agency, or other agency having approval jurisdiction over the Project.

4.6.4      District's Representative. The District hereby designates a District Board member, or his or her designee, to act as its representative for the performance of this Agreement ("District's Representative"). District's Representative shall have the power to act on behalf of the District for all purposes under this Contract. The District Board hereby designates **[INSERT NAME AND TITLE]**, or his or her designee, as the District's contact for the implementation of the Services hereunder. Contractor shall not accept direction or orders from any person other than the District's Representative or his or her designee.

4.6.5      Review and Approved Documents. Review all documents submitted by D-BE, including change orders and other matters requiring approval by the District Council or other officials. District shall advise D-BE of decisions pertaining to such documents within a reasonable time after submission, so as not to cause unreasonable delay as provided in the excusable delay provisions of this Agreement above.

#### 4.7 Compensation

4.7.1 D-BE's Compensation for Basic Services. District shall pay to D-BE, for the performance of all Services rendered under this Agreement, the total not to exceed amount of [INSERT WRITTEN AMOUNT] Dollars (\$[INSERT NUMERICAL AMOUNT]) ("Total Compensation"). This Total Compensation amount shall be based upon, and may be adjusted according to, the fee schedule and related terms and conditions attached hereto as Exhibit "B" and incorporated herein by reference. The Total Compensation, as may be adjusted upon mutual agreement, shall constitute complete and adequate payment for Services under this Agreement.

4.7.2 Payment for Additional Services. At any time during the term of this Agreement, District may request that D-BE perform Additional Services. As used herein, Additional Services means any work which is determined by District to be necessary for the proper completion of the Project, but which the Parties did not reasonably anticipate would be necessary at the execution of this Agreement. Any additional work more than this amount must be approved by the District. If authorized, such Additional Services will be compensated at the rates and in the manner set forth in Exhibit "C" attached hereto and incorporated herein by reference, unless a flat rate or some other form of compensation is mutually agreed upon by the parties. If District requires D-BE to hire consultants to perform any Additional Services, D-BE shall be compensated therefore at the rates and in the manner set forth in Exhibit "C" attached hereto and incorporated herein by reference, unless a flat rate or some other form of compensation is mutually agreed upon by the parties. District shall have the authority to review and approve the rates of any such consultants. In addition, D-BE shall be reimbursed for any expenses incurred by such consultants pursuant to the terms and conditions of Section 3.10.3.

4.7.3 Reimbursable Expenses. Reimbursable expenses are in addition to compensation for the Services and Additional Services. D-BE shall not be reimbursed for any expenses unless authorized in writing by District, which approval may be evidenced by inclusion in Exhibit "C" attached hereto. Such reimbursable expenses shall include only those expenses which are reasonably and necessarily incurred by D-BE in the interest of the Project. D-BE shall be required to acquire prior written consent in order to obtain reimbursement for the following: (1) extraordinary transportation expenses incurred in connection with the Project; (2) out-of-town travel expenses incurred in connection with the Project; (3) fees paid for securing approval of authorities having jurisdiction over the Project; (4) bid document duplication costs in excess of \$1,000; and (5) other costs, fees and expenses in excess of \$1,000.

4.7.4 Payment to D-BE. D-BE's compensation and reimbursable expenses shall be paid by District to D-BE no more often than monthly. Such periodic payments shall be made based upon the percentage of work completed, and in accordance with the phasing and funding schedule provided in Exhibit "B" and the compensation rates indicated in

Exhibit "C" attached hereto and incorporated herein by reference. To receive payment, D-BE shall present to District an itemized statement which indicates Services performed, percentage of Services completed, method for computing the amount payable, and the amount to be paid. The statement shall describe the number of Services provided since the initial commencement date, or since the start of the subsequent billing periods, as appropriate, through the date of the statement, as well as those expenses for which reimbursement is requested for that statement period. The amount paid to D-BE shall never exceed the percentage amounts authorized by the phasing and funding schedule located in Exhibit "B" attached hereto. District shall, within thirty (30) days of receiving such statement, review the statement and pay all approved charges thereon pursuant to the provisions of Civil Code Section 3320. Disputed amounts shall be resolved by the parties in a mutually agreeable manner.

Payments made for Additional Services shall be made in installments, not more often than monthly, proportionate to the degree of completion of such services or in such other manner as the parties shall specify when such services are agreed upon, and in accordance with any authorized fee or rate schedule. To receive payment, D-BE shall present to District an itemized statement which indicates the Additional Services performed, percentage of Additional Services completed, method for computing the amount payable, and the amount to be paid. The statement shall describe the number of Additional Services provided since the initial commencement date, or since the start of the subsequent billing periods, as appropriate, through the date of the statement. District shall, within thirty (30) days of receiving such statement, review the statement and pay all approved charges thereon pursuant to the provisions of Civil Code Section 3320. Disputed amounts shall be resolved by the parties in a mutually agreeable manner.

Upon cancellation or termination of this Agreement, D-BE shall be compensated as set forth in the termination provision herein.

**4.7.5 Withholding Payment to D-BE.** The District may withhold payment, in whole or in part, to the extent reasonably necessary to protect the District from claims, demands, causes of action, costs, expenses, liabilities, losses, damages, or injuries of any kind to the extent arising out of or caused by the negligence, recklessness, or willful misconduct protected under the indemnification provisions of this Agreement. Failure by District to deduct any sums from a progress payment shall not constitute a waiver of the District's right to such sums. The District may keep any moneys which would otherwise be payable at any time hereunder and apply the same, or so much as may be necessary therefor, to the payment of any expenses, losses, or damages as determined by the District, incurred by the District for which D-BE is liable under the Agreement or state law. Payments to the D-BE for compensation and reimbursable expenses due shall not be contingent on the construction, completion, or ultimate success of the Project. Payment to the D-BE shall not be withheld, postponed, or made contingent upon receipt by the District of offsetting reimbursement or credit from parties not within the D-BE's reasonable control.

**4.7.6 Prevailing Wages.** D-BE is aware of the requirements of California Labor Code Sections 1720, et seq., and 1770, et seq., as well as California Code of Regulations, Title 8, Section 16000, et seq., ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. If the Services are being performed as part of an applicable "public works" or "maintenance" project, as defined by the Prevailing Wage Laws, and if the total compensation is \$1,000 or more, D-BE agrees to fully comply with and to require its D-BEs to fully comply with such Prevailing Wage Laws. District shall provide D-BE with a copy of the prevailing rates of per diem wages in effect at the commencement of this Agreement. D-BE shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to execute the Services available to interested parties upon request and shall post copies at the D-BE's principal place of business and at the Project site. D-BE shall defend, indemnify, and hold the District, its officials, officers, employees, and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or alleged failure of the D-BE or its D-BEs to comply with the Prevailing Wage Laws. It shall be mandatory upon the D-BE and all subconsultants to comply with all California Labor Code provisions, which include but are not limited to prevailing wages (Labor Code Sections 1771, 1774 and 1775), employment of apprentices (Labor Code Section 1777.5), certified payroll records (Labor Code Sections 1771.4 and 1776), hours of labor (Labor Code Sections 1813 and 1815) and debarment of contractors and subcontractors (Labor Code Section 1777.1). The requirement to submit certified payroll records directly to the Labor Commissioner under Labor Code section 1771.4 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Section 1771.4.

**4.7.7 Registration.** If the Services are being performed as part of an applicable "public works" or "maintenance" project, then pursuant to Labor Code Sections 1725.5 and 1771.1, the D-BE and all subcontractors performing such Services must be registered with the Department of Industrial Relations. D-BE shall maintain registration for the duration of the Project and require the same of any subcontractors, as applicable. Notwithstanding the foregoing, the contractor registration requirements mandated by Labor Code Sections 1725.5 and 1771.1 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Sections 1725.5 and 1771.1.

**4.7.8 Labor Compliance.** This Project may also be subject to compliance monitoring and enforcement by the Department of Industrial Relations. It shall be D-BE's sole responsibility to comply with all applicable registration and labor compliance requirements. Any stop orders issued by the Department of Industrial Relations against D-BE or any subcontractor that affect D-BE's performance of Services, including any delay, shall be D-BE's sole responsibility. Any delay arising out of or resulting from such stop orders shall be considered D-BE caused delay and shall not be compensable by the District. D-BE shall defend, indemnify, and hold the District, its

officials, officers, employees, and agents free and harmless from any claim or liability arising out of stop orders issued by the Department of Industrial Relations against D-BE or any subcontractor.

4.7.9 Statutory Penalty For Failure to Pay Minimum Wages: In accordance with 1775 (a) through (c) of the California Labor Code, the contractor shall as a penalty to the State or political subdivision on whose behalf a contract is made or awarded, forfeit the current statutory penalty for each calendar day or portion thereof, for each worker paid less than the prevailing wage rates as determined by the director for the work or craft in which the worker is employed for any public work done under the contract by the contractor or, except as provided in subdivision 1775 (b), by any subcontractor under the contractor.

4.7.10 Statutory Penalty for Unauthorized Overtime Work: In accordance with Section 1813 of the California Labor Code, the contractor shall as a penalty to the State or political subdivision on whose behalf the contract is made or awarded, forfeit the current statutory penalty for each worker employed in the execution of the contract by the respective contractor or subcontractor for each calendar day during which said worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of Sections 1810-1815 of the California Labor Code.

4.7.11 Payroll Records: D-BE shall keep accurate payroll records in format specified by the Division of Labor Standards Enforcement. Said information shall include, but not be limited to, a record of the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and actual per diem wages paid to each journeyman, apprentice, or worker employed by the contractor. Copies of such record shall be made available for inspection at all reasonable hours, and a copy shall be made available to employee or his authorized representative, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards in compliance with California Labor Code, Section 1776. D-BE and subcontractors shall furnish and submit electronic certified payrolls directly to the Labor Commissioner, and duplicate copies available to the District.

#### **4.8 Notice to Proceed.**

D-BE shall not proceed with performance of any Services under this Agreement unless and until the District provides a written notice to proceed.

#### **4.9 Termination, Suspension and Abandonment.**

4.9.1 Grounds for Termination; D-BE's Termination for Cause. District hereby reserves the right to suspend or abandon, at any time and for any reason, all or any portion of the Project and the construction work thereon, or to terminate this Agreement at any time with or without cause. D-BE shall be provided with at least seven (7) days advanced written notice of such suspension, abandonment, or termination. In the event of such

suspension, abandonment or termination, D-BE shall be paid for Services and reimbursable expenses rendered up to the date of such suspension, abandonment, or termination, pursuant to the schedule of payments provided for in this Agreement, less any claims against or damages suffered by District because of the default, if-any, by D-BE. D-BE hereby expressly waives all claims for damages or compensation arising under this Agreement, except as set forth herein, in the event of such suspension, abandonment or termination. D-BE may terminate this Agreement for substantial breach of performance by the District such as failure to make payment to D-BE as provided in this Agreement.

4.9.2      District's Suspension of Work. If D-BE's Services are suspended by District, District may require D-BE to resume such Services within ninety (90) days after written notice from District. When the Project is resumed, the Total Compensation and schedule of Services shall be equitably adjusted upon mutual agreement of the District and D-BE.

4.9.3      Documents and Other Data. Upon suspension, abandonment or termination, D-BE shall provide to District all preliminary studies, sketches, working drawings, specifications, computations, and all other Project Documents, as defined below, to which District would have been entitled at the completion of D-BE's Services under this Agreement. Upon payment of the amount required to be paid to D-BE pursuant to the termination provisions of this Agreement, District shall have the rights, as provided in this Agreement hereinafter, to use such Project Documents prepared by or on behalf of D-BE under this Agreement. D-BE shall make such documents available to District upon request and without additional compensation other than as may be approved as a reimbursable expense.

4.9.4      Employment of other D-BEs. In the event this Agreement is terminated in whole or in part as provided herein, District may procure, upon such terms and in such manner as it may determine appropriate, services like those terminated.

#### **4.10 Ownership and Use of Documents: Confidentiality.**

4.10.1    Ownership. All plans, specifications, original or reproducible transparencies of working drawings and master plans, preliminary sketches, design presentation drawings, structural computations, estimates and any other documents prepared pursuant to this Agreement, including, but not limited to, any other works of authorship fixed in any tangible medium of expression such as writings, physical drawings and data magnetically or otherwise recorded on computer diskettes (hereinafter referred to as the "Project Documents" shall be and remain the property of District. Although the official copyright in all Project Documents shall remain with the D-BE or other applicable subcontractors or D-BEs, the Project Documents shall be the property of District whether or not the work for which they were made is executed or completed. Within thirty (30) calendar days following completion of the Project, D-BE shall provide to District copies of all Project Documents required by

District. In addition, D-BE shall retain copies of all Project Documents on file for a minimum of fifteen (15) years following completion of the Project and shall make copies available to District upon the payment of reasonable duplication costs. Before destroying the Project Documents following this retention period, D-BE shall make a reasonable effort to notify District and provide District with the opportunity to obtain the documents.

4.10.2 Right to Use. D-BE grants to District the right to use and reuse all or part of the Project Documents, at District's sole discretion and with no additional compensation to D-BE, for the following purposes:

- (a) The construction of all or part of this Project.
- (b) The repair, renovation, modernization, replacement, reconstruction, or expansion of this Project at any time.
- (c) The construction of another project by or on behalf of District for its ownership and use.

District is not bound by this Agreement to employ the services of D-BE in the event such documents are used or reused for these purposes. District shall be able to use or reuse the Project Documents for these purposes without risk of liability to the D-BE or third parties with respect to the condition of the Project Documents, and the use or reuse of the Project Documents for these purposes shall not be construed or interpreted to waive or limit District's right to recover for latent defects or for errors or omissions of the D-BE.

Any use or reuse by District of the Project Documents on any project other than this Project without employing the services of D-BE shall be at District's own risk with respect to third parties. If District uses or reuses the Project Documents on any project other than this Project, it shall remove the D-BE's seal from the Project Documents and hold harmless D-BE and its officers, directors, agents, and employees from claims arising out of the negligent use or re-use of the Project Documents on such other project.

4.10.3 License. This Agreement creates a non-exclusive and perpetual license for District to copy, use, modify or reuse any and all Project Documents and any intellectual property rights therein. D-BE shall require any and all subcontractors and D-BEs to agree in writing that District is granted a non-exclusive and perpetual license for the work of such subcontractors or D-BEs performed pursuant to this Agreement.

4.10.4 Right to License. D-BE represents and warrants that D-BE has the legal right to license any and all copyrights, designs and other intellectual property embodied in the Project Documents that D-BE prepares or causes to be prepared pursuant to this Agreement. D-BE shall indemnify and hold District harmless pursuant to the indemnification provisions of this Agreement for any breach of this Section. D-BE makes no such representation and warranty regarding previously prepared designs, plans, specifications, studies, drawings, estimates or other documents that were prepared by design professionals other than D-BE and provided to D-BE by District.

4.10.5 Confidentiality. All Project Documents, either created by or provided to D-BE in connection with the performance of this Agreement, shall be held confidential by D-BE to the extent they are not subject to disclosure pursuant to the Public Records Act. All Project Documents shall not, without the written consent of District, be used or reproduced by D-BE for any purposes other than the performance of the Services. D-BE shall not disclose, cause or facilitate the disclosure of the Project Documents to any person or entity not connected with the performance of the Services or the Project. Nothing furnished to D-BE which is otherwise known to D-BE or is generally known, or has become known, to the related industry shall be deemed confidential. D-BE shall not use District's name or insignia, photographs of the Project, or any publicity pertaining to the Services or the Project in any magazine, trade paper, newspaper, television or radio production or other similar medium without the written consent of District.

#### **4.11 Indemnification.**

4.11.1 To the fullest extent permitted by law, D-BE shall defend (with counsel of District's choosing), indemnify and hold the District, its officials, officers, employees, volunteers, and agents free and harmless from any and all claims, demands, causes of action, costs, expenses, liability, loss, damage or injury of any kind, in law or equity, to property or persons, including wrongful death, in any manner arising out of, pertaining to, or incident to any acts, errors or omissions, or willful misconduct of D-BE, its officials, officers, employees, subcontractors, consultants or agents in connection with the performance of the D-BE's services, the Project or this Agreement, including without limitation the payment of all damages, expert witness fees and attorney's fees and other related costs and expenses. D-BE's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by D-BE, the District, its officials, officers, employees, agents, or volunteers.

4.11.2 If D-BE's obligation to defend, indemnify, and/or hold harmless arises out of D-BE's performance of "design professional" services (as that term is defined under Civil Code section 2782.8), then, and only to the extent required by Civil Code section 2782.8, which is fully incorporated herein, D-BE's indemnification obligation shall be limited to claims that arise out of, pertain to, or relate to the negligence, recklessness, or willful misconduct of the D-BE, and, upon D-BE obtaining a final adjudication by a court of competent jurisdiction, D-BE's liability for such claim, including the cost to defend, shall not exceed the D-BE's proportionate percentage of fault.

**4.12 Insurance. [RISK MANAGER TO REVIEW PRIOR TO USE]** D-BE shall not commence work under this Agreement until it has provided evidence satisfactory to the District that it has secured all insurance required under this Section. In addition, D-BE shall not allow any subcontractor to commence work on any subcontract until it has provided evidence satisfactory to the District that the subcontractor has secured all insurance required under this section.

4.12.1 Types of Insurance Required. As a condition precedent to the effectiveness of this Agreement for work to be performed hereunder, and without limiting the indemnity provisions of the Agreement, D-BE shall, at its expense, procure and

maintain in full force and effect for the duration of the Agreement the following policies of insurance. If the existing policies do not meet the insurance requirements set forth herein, D-BE agrees to amend, supplement, or endorse the policies to do so.

4.12.2 Additional Insured. The District, its officials, officers, employees, agents, and volunteers shall be named as additional insureds on D-BE's and its subcontractor's policies of commercial general liability and automobile liability insurance using the endorsements and forms specified herein or exact equivalents.

4.12.3 Commercial General Liability

(a) The D-BE shall take out and maintain, during the performance of all work under this Agreement, in amounts not less than specified herein, Commercial General Liability Insurance, in a form and with insurance companies acceptable to the District.

(b) Coverage for Commercial General Liability insurance shall be at least as broad as the following: Insurance Services Office Commercial General Liability coverage (Occurrence Form CG 00 01) or exact equivalent. Commercial General Liability Insurance must include coverage for the following:

- (1) Bodily Injury and Property Damage
- (2) Personal Injury/Advertising Injury
- (3) Premises/Operations Liability
- (4) Products/Completed Operations Liability
- (5) Aggregate Limits that Apply per Project
- (6) Explosion, Collapse and Underground (UCX) exclusion deleted
- (7) Contractual Liability with respect to this Contract
- (8) Broad Form Property Damage
- (9) Independent Contractors Coverage

(c) The policy shall contain no endorsements or provisions limiting coverage for (1) contractual liability; (2) cross liability exclusion for claims or suits by one insured against another; (3) products/completed operations liability; or (4) contain any other exclusion contrary to the Agreement.

(d) The policy shall give District, the District Board and each member of the District Board, its officers, employees, agents and District designated

volunteers additional insured status using ISO endorsement forms CG 20 10 10 01 and 20 3710 01, or endorsements providing the exact same coverage.

(e) The general liability program may utilize either deductibles or provide coverage excess of a self-insured retention, subject to written approval by the District, and provided that such deductibles shall not apply to the District as an additional insured.

#### 4.12.4 Automobile Liability

(a) At all times during the performance of the work under this Agreement, the D-BE shall maintain Automobile Liability Insurance for bodily injury and property damage including coverage for owned, non-owned and hired vehicles, in a form and with insurance companies acceptable to the District.

(b) Coverage for automobile liability insurance shall be at least as broad as Insurance Services Office Form Number CA 00 01 covering automobile liability (Coverage Symbol 1, any auto).

(c) The policy shall give District, the District Council and each member of the District Council, its officers, employees, agents, and District designated volunteers additional insured status.

(d) Subject to written approval by the District, the automobile liability program may utilize deductibles, provided that such deductibles shall not apply to the District as an additional insured, but not a self-insured retention.

#### 4.12.5 Workers' Compensation/Employer's Liability

(a) D-BE certifies that he/she is aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and he/she will comply with such provisions before commencing work under this Agreement. To the extent D-BE has employees at any time during the term of this Agreement, at all times during the performance of the work under this Agreement, the D-BE shall maintain full compensation insurance for all persons employed directly by him/her to carry out the work contemplated under this Agreement, all in accordance with the "Workers' Compensation and Insurance Act," Division IV of the Labor Code of the State of California and any acts amendatory thereof, and Employer's Liability Coverage in amounts indicated herein. D-BE shall require all subcontractor to obtain and maintain, for the period required by this Agreement, workers' compensation coverage of the same type and limits as specified in this Section.

#### 4.12.6 Professional Liability (Errors and Omissions)

(a) At all times during the performance of the work under this Agreement the D-BE shall maintain professional liability or Errors and Omissions

insurance appropriate to its profession, in a form and with insurance companies acceptable to the District and in an amount indicated herein. This insurance shall be endorsed to include contractual liability applicable to this Agreement and shall be written on a policy form coverage specifically designed to protect against acts, errors, or omissions of the D-BE. "Covered Professional Services" as designated in the policy must specifically include work performed under this Agreement. The policy must "pay on behalf of" the insured and must include a provision establishing the insurer's duty to defend.

#### 4.12.7 Minimum Policy Limits Required

(a) The following insurance limits are required for the Agreement:

Commercial General Liability: \$1,000,000 per occurrence/ \$2,000,000 aggregate for bodily injury, personal injury, and property damage

Automobile Liability Employer's Liability Professional Liability: \$1,000,000 combined single limit

Combined Single Limit: \$1,000,000 per accident or disease

Professional Liability Insurance: \$1,000,000 per claim and aggregate (errors and omissions)

(b) Defense costs shall be payable in addition to the limits.

(c) Requirements of specific coverage or limits contained in this Section are not intended as a limitation on coverage, limits, or other requirement, or a waiver of any coverage normally provided by any insurance. Any available coverage shall be provided to the parties required to be named as Additional Insured pursuant to this Agreement.

#### 4.12.8 Evidence Required

(a) Prior to execution of the Agreement, the D-BE shall file with the District evidence of insurance from an insurer or insurers certifying to the coverage of all insurance required herein. Such evidence shall include original copies of the ISO CG 00 01 (or insurer's equivalent) signed by the insurer's representative and Certificate of Insurance (Acord Form 25-S or equivalent), together with required endorsements. All evidence of insurance shall be signed by a properly authorized officer, agent, or qualified representative of the insurer and shall certify the names of the insured, any additional insureds, where appropriate, the type and amount of the insurance, the location and operations to which the insurance applies, and the expiration date of such insurance.

#### 4.12.9 Policy Provisions Required

(a) D-BE shall provide the District at least thirty (30) days prior written notice of cancellation of any policy required by this Agreement, except that the D-BE shall provide at least ten (10) days prior written notice of cancellation of any such policy due to non-payment of premium. If any of the required coverage is cancelled or expires

during the term of this Agreement, the D-BE shall deliver renewal certificate(s) including the General Liability Additional Insured Endorsement to the District at least ten (10) days prior to the effective date of cancellation or expiration.

(b) The Commercial General Liability Policy and Automobile Policy shall each contain a provision stating that D-BE's policy is primary insurance and that any insurance, self-insurance or other coverage maintained by the District or any named insureds shall not be called upon to contribute to any loss.

(c) The retroactive date (if any) of each policy is to be no later than the effective date of this Agreement. D-BE shall maintain such coverage continuously for a period of at least three years after the completion of the work under this Agreement. D-BE shall purchase a one (1) year extended reporting period A) if the retroactive date is advanced past the effective date of this Agreement; B) if the policy is cancelled or not renewed; or C) if the policy is replaced by another claims-made policy with a retroactive date after the effective date of this Agreement.

(d) All required insurance coverages, except for the professional liability coverage, shall contain or be endorsed to waiver of subrogation in favor of the District, its officials, officers, employees, agents, and volunteers or shall specifically allow D-BE or others providing insurance evidence in compliance with these specifications to waive their right of recovery prior to a loss. D-BE hereby waives its own right of recovery against District and shall require similar written express waivers and insurance clauses from each of its subcontractors.

(e) The limits set forth herein shall apply separately to each insured against whom claims are made or suits are brought, except with respect to the limits of liability. Further the limits set forth herein shall not be construed to relieve the D-BE from liability more than such coverage, nor shall it limit the D-BE's indemnification obligations to the District and shall not preclude the District from taking such other actions available to the District under other provisions of the Agreement or law.

#### 4.12.10 Qualifying Insurers

(a) All policies required shall be issued by acceptable insurance companies, as determined by the District, which satisfy the following minimum requirements: Each such policy shall be from a company or companies with a current AM. Best's rating of no less than A:VII and admitted to transact in the business of insurance in the State of California, or otherwise allowed to place insurance through surplus line brokers under applicable provisions of the California Insurance Code or any federal law.

#### 4.12.11 Additional Insurance Provisions

(a) The foregoing requirements as to the types and limits of insurance coverage to be maintained by D-BE, and any approval of said insurance by the District, is not intended to and shall not in any manner limit or qualify the liabilities

and obligations otherwise assumed by the D-BE pursuant to this Agreement, including but not limited to, the provisions concerning indemnification.

(b) If at any time during the life of the Agreement, any policy of insurance required under this Agreement does not comply with these specifications or is canceled and not replaced, District has the right but not the duty to obtain the insurance it deems necessary, and any premium paid by District will be promptly reimbursed by D-BE or District will withhold amounts sufficient to pay premium from D-BE payments. In the alternative, District may cancel this Agreement.

(c) The District may require the D-BE to provide complete copies of all insurance policies in effect for the duration of the Project.

(d) Neither the District nor the District Council, nor any member of the District Council, nor any of the officials, officers, employees, agents or volunteers shall be personally responsible for any liability arising under or by virtue of this Agreement.

#### 4.12.12                   Subcontractor Insurance Requirements

(a) D-BE shall not allow any subcontractors or subconsultants to commence work on any subcontract until they have provided evidence satisfactory to the District that they have secured all insurance required under this Section. Policies of commercial general liability insurance provided by such subcontractors or subconsultants shall be endorsed to name the District as an additional insured using ISO form CG 20 38 04 13 or an endorsement providing the exact same coverage. If requested by D-BE, District may approve different scopes or minimum limits of insurance for particular subcontractors or subconsultants.

#### 4.13                   Records.

D-BE shall maintain complete and accurate records with respect to all costs and expenses incurred under this Agreement. All such records shall be clearly identifiable.

D-BE shall allow a representative of District during normal business hours to examine, audit, and make transcripts or copies of such records and any other documents created pursuant to this Agreement. D-BE shall allow inspection of all work, data, documents, proceedings, and activities related to the Agreement for a period of five (5) years from the date of final payment under this Agreement.

#### 4.14                   Standardized Manufactured Items.

D-BE shall cooperate and consult with District in the use and selection of manufactured items on the Project, including but not limited to, bridge, paint, hardware, and significant materials. All such manufactured items shall be standardized to District's criteria to the extent such criteria do not interfere with

building design.

4.15        **Limitation of Agreement.**

This Agreement is limited to and includes only the work included in the Project described herein. Any additional or subsequent construction at the site of the Project, or at any other District site, will be covered by, and be the subject of, a separate Agreement for design services between District and the D-BE chosen therefor by District.

4.16        **Mediation.**

Disputes arising from this Agreement may be submitted to mediation if mutually agreeable to the parties hereto. The type and process of mediation to be utilized shall be subject to the mutual agreement of the parties.

4.17        **Successors and Assigns.**

This Agreement shall be binding upon and shall inure to the benefit of the successors in interest, executors, administrators and assigns of each party to this Agreement. However, D-BE shall not assign or transfer by operation of law or otherwise any or all of its rights, burdens, duties or obligations without the prior written consent of District. Any attempted assignment without such consent shall be invalid and void.

4.18        **Asbestos Certification.**

D-BE shall certify to District, in writing and under penalty of perjury, that to the best of its knowledge, information and belief no asbestos-containing material or other material deemed to be hazardous by the state or federal government was specified as a building material in any construction document that the D-BE prepares for the Project. D-BE shall require all consultants who prepare any other documents for the Project to submit the same written certification. D-BE shall also assist the District in ensuring that contractors provide District with certification, in writing and under penalty of perjury, that to the best of their knowledge, information and belief no material furnished, installed, or incorporated into the Project contains asbestos or any other material deemed to be hazardous by the state or federal government.

These certifications shall be part of the final Project submittal. D-BE shall include statements in its specifications that materials containing asbestos, or any other material deemed to be hazardous by the state or federal government are not to be included.

4.19        **No Third Party Rights.**

This Agreement shall not create any rights in, or inure to the benefits of, any

third party except as expressly provided herein.

4.20        **Governing Law.**

This Agreement shall be construed in accordance with, and governed by, the laws of the State of California. Venue shall be in San Bernardino County.

4.21        **Exhibits and Recitals.**

All exhibits and recitals contained herein and attached hereto are material parts of this Agreement and are incorporated as if fully set forth.

4.22        **Severability.**

Should any provision in the Agreement be held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions shall continue in full force and effect.

4.23        **Non-Waiver.**

None of the provisions of this Agreement shall be considered waived by either party, unless such waiver is specifically specified in writing.

4.24        **Safety.**

D-BE shall execute and maintain its work to avoid injury or damage to any person or property. In carrying out its Services, the D-BE shall always be in compliance with all applicable local, state and federal laws, rules and regulations, and shall exercise all necessary precautions for the safety of its employees, D-BE and subcontractors appropriate to the nature of the work and the conditions under which the work is to be performed.

4.25        **Delivery of Notices.**

All notices permitted or required under this Agreement shall be given to the respective parties at the following address, or at such other address as the respective parties may provide in writing for this purpose:

D-BE  
[\*\*\*INSERT NAME, ADDRESS & CONTACT PERSON\*\*\*]

District:  
Graeagle Community Services Dist.  
Xx  
Graeagle, CA 96103  
Attn: Christopher Ruedy

Such notice shall be deemed made when personally delivered or when mailed, forty- eight (48) hours after deposit in the U.S. Mail, first class postage prepaid and addressed to the party at its applicable address. Actual notice shall be deemed adequate notice on the date actual notice occurred, regardless of the method of service.

4.26        **Time of Essence.**

Time is of the essence for each and every provision of this Agreement.

4.27        **District's Right to Employ Other D-BEs.**

District reserves right to employ other D-BEs, including D-BEs, in connection with this Project or other projects.

4.27.1        **Prohibited Interests.** Solicitation. D-BE maintains and warrants that it has not employed nor retained any company or person, other than a bona fide employee working solely for D-BE, to solicit or secure this Agreement. Further, D-BE warrants that it has not paid nor has it agreed to pay any company or person, other than a bona fide employee working solely for D-BE, any fee, commission, percentage, brokerage fee, gift or other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, District shall have the right to rescind this Agreement without liability.

4.27.2        Conflict of Interest. For the term of this Agreement, no director, official, officer or employee of District, during the term of his or her service with District, shall have any direct interest in this Agreement, or obtain any present or anticipated material benefit arising therefrom.

4.28        **Equal Opportunity Employment.**

D-BE represents that it is an equal opportunity employer and that it shall not discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, sex, age or any other classification protected by federal or state law. Such non-discrimination shall include, but not be limited to, all activities related to initial employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination. D-BE shall also comply with all relevant provisions of District's minority business enterprise program, affirmative action plan or other related programs or guidelines currently in effect or hereinafter enacted.

4.29        **Labor Certification.**

By its signature hereunder, D-BE certifies that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be

insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of that Code and agrees to comply with such provisions before commencing the performance of the Services.

4.30        **Subcontracting.**

As specified in this Agreement, D-BE shall not subcontract any portion of the Services required by this Agreement, except as expressly stated herein, without prior written approval of District. Subcontracts, if any, shall contain a provision making them subject to each and every provision of this Agreement.

4.31        **Supplemental Conditions.**

Any supplemental conditions shall be attached as an exhibit to this Agreement, and that exhibit shall be incorporated herein by reference.

4.32        **Entire Agreement.**

This Agreement, with its exhibits, contains the entire agreement of the parties hereto, and supersedes any and all other prior or contemporaneous negotiations, understandings and oral or written agreements between the parties hereto. Each party acknowledges that no representations, inducements, promises or agreements have been made by any person which are not incorporated herein, and that any other agreements shall be void. Furthermore, any modification of this Agreement shall only be effective if in writing signed by all parties hereto.

**SIGNATURE PAGE FOR DESIGN SERVICES AGREEMENT BETWEEN THE  
GRAEAGLE COMMUNITYSERVICES DISTRICT  
AND \*\*\*INSERT NAME\*\*\***

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the date first written above.

GRAEAGLE  
COMMUNITY  
SERVICES  
DISTRICT

[INSERT NAME OF D-BE]

Board Chair

By: \_\_\_\_\_ Printed Name: \_\_\_\_\_

ATTEST:

By: \_\_\_\_\_  
District Secretary

# Evaluation Criteria

## ***Mandatory Criteria***

The submission must be provided in three (3) hard copies and one (1) pdf copy.

## ***Scored Selection Criteria***

GCSD intends to select the most qualified consultant available for this assignment that demonstrates a thorough understanding of GCSD's needs and the ability to deliver the project for a reasonable fee. It is imperative the Consultant's proposal fully addresses all aspects of the RFP. The proposal must clearly articulate the Consultant's understanding of the project and GCSD's specific requirements.

Follow-up discussion or contract negotiations with the selected consultant may be utilized to finalize the scope of the work. If a contract cannot be negotiated with the highest ranked consultant for this project, the negotiations shall be terminated in writing and negotiations shall be started with the next highest ranked consultant.

The GCSD will evaluate proposals based on qualifications of the Respondent, understanding of the scope of work, proposed methodology (including the requirements of the CEQA process), managerial capabilities, proposal content and price.

Due to the desire for aesthetic bridge construction over a sensitive environment, the firm will be selected based on the best overall proposal, including past performance and reputation, current capabilities, schedule, and price. The following criteria listed in Table 1 will be used for the initial evaluation:

**Table 1: Scored Evaluation Criteria**

Item Criteria	Available Points
<b>1      Experience of the Respondent</b> Experience in design-build projects, proven past performance, organizational values and reputation, favorable references for similar projects. Experience of the Respondent's Project Manager / Construction Manager, site superintendent and anticipated field crew; availability of key personnel throughout the project.	20

Item Criteria	Available Points
<b>2 Quality assurance</b> Demonstration of quality of construction and design in previous projects. Use of an established quality control method in construction. Reference to technical specifications that will be used to control the quality of the design & construction.	10
<b>3 Adherence to the Performance Requirements</b> Adherence to the Performance Requirements. Demonstration of designs or construction methods that maintain or improve upon the Performance Requirements.	10
<b>4 Adherence to the Environmental Objectives</b> Adherence to environmental objectives. Demonstration of designs or construction methods that maintain or improve upon the Environmental Objectives.	10
<b>5 Adherence to the Aesthetic Design Objectives</b> Adherence to the Aesthetic Design Objectives. Demonstration of designs or construction methods that maintain or improve upon the Aesthetic Design Objectives.	10
<b>6 Price</b> Cost of the proposal - proposals submitted more than the project budget may not be considered. Suggestions for items that are outside the basic requirements in the RFP should be outlined and priced separately.	20
<b>7 Schedule</b> Adherence to the milestone dates, suggested methods to improve upon the end date milestone.	20

Total available points 100

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## **EXHIBIT "A"** **D-BE'S SCOPE OF SERVICES**

### **1. GENERAL REQUIREMENTS.**

**1.1 Basic Services.** D-BE agrees to perform all the necessary professional and construction services for Project permitting and liaison with federal, state, and local agencies, bid solicitation, bid supervision, Project construction, construction testing, inspection (and any other necessary engineering services mutually agreeable to the parties), construction administration services, in a timely and professional manner, consistent with the standards of the profession, including those provided for herein.

**1.2 Exclusions from Basic Services.** The following services shall be excluded from the basic services listed above: **[INSERT IF APPLICABLE]**  
**[COMMON EXCLUSIONS: landscape architectural, hazardous waste or toxic substances engineering or other SERVICES.]**

**1.3 Additional Services.** D-BE shall perform the following Additional Services for the Project: **[INSERT ADDITIONAL SERVICES OR "N/A" IF NOT APPLICABLE]**

**1.4 Communication with District.** D-BE shall participate in consultations and conferences with authorized representatives of District and/or other local, regional, or state agencies concerned with the Project, which may be necessary for the completion of the Project or the development of the drawings, specifications, and documents in accordance with the applicable standards and requirements of law and the District. Such consultations and conferences shall continue throughout the planning and construction of the Project and the contractor's warranty period. D-BE shall take direction only from the District's Representative, or any other representative specifically designated by the District for this Project, including any construction manager hired by the District.

**1.5 Coordination and Cooperation with Construction Manager.** A Design-Build construction manager will require that the D-BE administer and coordinate all or any part of the Project on the District's behalf. The District shall provide a copy of its agreement with the Design-Build construction manager so that the D-BE will be fully aware of the duties and responsibilities of the construction manager. The D-BE shall cooperate with the construction manager and respond to any requests or directives authorized by the District to be made or given by the construction manager. The D-BE shall request clarification from the District in writing if the D-BE should have any questions regarding the authority of the construction manager.

### **2. INITIAL CONSTRUCTION PHASE.**

**2.1 Permits, Approvals and Authorizations.** As indicated in Section 3.5.4 of the Agreement, D-BE shall assist District in securing encroachment permits, abutment permit (e.g., Plumas County Miscellaneous permit), as well as coordinating with utilities and the Graeagle Land and Water Company property owner.

### **3. CONSTRUCTION PHASE.**

During the construction phase of the Project, D-BE shall do all the following, as well as any incidental services thereto:

**3.1 Construction and Observation.** The Project D-BE shall construct the bridge abutments and pathways leading to and from the bridge in ADA compliance, coordinate the placement of the bridge, observe work executed from the Final Working Drawings and Specifications in person, if District may, in its discretion, consent to such observation by another competent representative of D-BE.

**3.2 Testing.** Retain consultant(s) to conduct chemical, mechanical, soils, geological or other tests required for proper construction and installation of the Project.

**3.3 Required Inspections.** Retain consultants) to conduct materials testing and inspection or environmental/hazardous materials testing and inspection pursuant to any applicable laws, rules, or regulations.

**3.4 General Administration.** D-BE shall provide general administration of the Construction Documents and the work performed by the D-BE's contractors.

**3.5 Pre-Construction Meeting.** D-BE shall conduct one or more pre-construction meetings, as the District determines is needed for the Project, with all interested parties.

**3.6 Site Visits of D-BE Contractor's Work.** D-BE shall conduct site visits to observe each contractors' work for general conformance with the Construction Documents and with any approved construction schedules or milestones. Such site visits shall be conducted as often as are necessary and appropriate to the stage of construction, according to the District's sole discretion, but in no event less than weekly.

**3.7 Coordination of D-BE's Consultants and Contractors.** D-BE shall cause all contractors, architects, engineers, and other consultants, as may be hired by D-BE or District, to observe the work completed under their disciplines as required and approve and review all test results for general conformance with the Construction Documents.

**3.8 Reports.** D-BE shall make regular reports as may be required by applicable federal, state, or local laws, rules, or regulations, as well as the federal, state, regional or local agencies concerned with the Project.

**3.9 Construction Meetings; Minutes.** D-BE shall attend all construction meetings and provide written reports/minutes to the District after each construction meeting to keep District informed of the progress of the work. Such meetings shall occur at a frequency necessary for the progress of the Project work, according to the District's sole discretion, but no less than weekly.

**3.10 Written Reports.** D-BE shall make written reports to District as necessary

to inform District of problems arising during construction, changes contemplated because of each such problems, and progress of the Project work.

3.11       **Written Records.** D-BE shall keep accurate written records of the progress and quality of the Project work and the time schedules and shall advise the contractors and District of any deviations from the time schedule which could delay timely completion of the Project.

3.12       **Material and Test Reports.** D-BE shall check and process, in a timely manner, all required material and test reports for the Project work. In addition, D-BE shall provide notice of any deficiencies in material or work reflected in such reports, as well as its recommendation for correction of such deficiencies, to the contractors and District.

3.13       **Review and Response to Submissions.** D-BE shall review and respond, in a timely manner, to all schedules, submittals, shop drawings, samples, information requests, change requests, and other submissions of the contractor and subcontractors for compliance with, or alterations and additions to, the Construction Documents. D-BE's review and response shall be done in such a manner so as to ensure the timely and uninterrupted progress of the Project work.

3.14       **Rejection of Work.** D-BE shall promptly reject, as discussed with District, work or materials which do not conform to the Construction Documents. D-BE shall immediately notify the District and contractor(s) of such rejections. D-BE shall also have the authority to recommend to the District that additional inspection or testing of the work be performed, whether or not such work is fabricated, installed or completed.

3.15       **Substitutions.** D-BE shall consult with District, in a timely manner, about substitution of materials, equipment and laboratory reports thereof, prior to the District's final written approval of such substitutions. D-BE's consultation shall be done in such a manner to ensure the timely and uninterrupted progress of the Project work.

3.16       **Change Requests and Material Changes.** D-BE shall evaluate and advise District, in a timely manner and in writing, of any change requests and material change{s} which may be requested or necessary in the Project plans and specifications. D-BE shall provide the District with its opinion as to whether such change requests should be approved, denied, or revised. If the District has not hired a construction manager or other person to do so, the D-BE shall prepare and execute all change orders and submit them to the District for authorization. If the District has designated a construction manager or other person to prepare all change orders, the D-BE shall review all change orders prepared by such person, execute them, and deliver them to the District for authorization if they meet with the D-BE's approval, or submit them to the District with recommendations for revision or denial if necessary. D-BE shall not order contractors to make any changes affecting the contract price without approval by District of such a written change order, pursuant to the terms of the Construction Documents. D-BE may order on its own responsibility and pending District Council approval, changes necessary to meet construction emergencies, if written approval of District's Representative is first secured.

3.17       **Applications for Payment.** D-BE shall examine, verify and approve contractor's applications for payment, and shall issue certificates for payment in amounts approved by the District's inspector.

3.18       **Substantial Completion.** D-BE shall determine the date of substantial completion, in consultation with the District.

3.19       **Punch List.** After determining that the Project is substantially complete, D-BE shall participate in the inspection of the Project and shall review all remaining deficiencies and minor items needed to be corrected or completed on the Project, including those identified on the punch list prepared by the contractor ("Punch List Items"). D-BE shall notify contractor in writing that all Punch List Items must be corrected prior to final acceptance of the Project and final payment. D-BE shall also notify District of all Punch List Items.

3.20       **Warranties.** D-BE shall review materials assembled by the contractor and subcontractors with regard to all written warranties, guarantees, owners' manuals, instruction books, diagrams, record "as built" drawings, and any other materials required from the contractors and subcontractors pursuant to the Construction Documents. D-BE shall coordinate and provide these materials to the District.

3.21       **Certificate of Completion.** D-BE shall participate in any further inspections of the Project necessary to issue D-BE's Certificate of Completion and final certificate for payment.

3.22       **Documents for Project Close-Out.** D-BE shall cause all other architects, engineers and other D-BEs, as may be hired by D-BE, to file any and all required documentation with the District or other governmental authorities necessary to close out the Project. D-BE shall assist the District in obtaining such documentation from all other architects, engineers, or other D-BEs.

#### 4.       As-Built DRAWINGS.

During the as-built drawings phase of the Project, D-BE shall do all of the following, as well as any incidental services thereto:

4.1       **As-Built Drawings and Specifications.** Not later than thirty (30) days after substantial completion of the Project, before receipt of final payment, D-BE shall review and forward the Final Working Drawings and Specifications, indicating on them all changes made by change orders or otherwise pursuant to the Construction Documents, as well as all information called for on the specifications, thus producing an "as-built" set of Final Working Drawings and Specifications ("As-Built Drawings and Specifications"). The As-Built Drawings and Specifications shall show, among other things, the location of all concealed pipe, buried conduit runs and other similar elements within the completed

Project. D-BE shall personally review and certify that the As-Built Drawings and Specifications are a correct representation of the information supplied to D-BE by any inspectors and the contractor and shall obtain certifications from any inspectors and the contractor that the drawings are correct.

**4.2 Approval.** Once District provides D-BE with specific written approval of the As-Built Drawings and Specifications, D-BE shall forward to District the complete set of original As-Built Drawings and Specifications or a complete set of reproducible duplicate As-Built Drawings and Specifications. The tracing shall be of such quality that clear and legible prints may be made without appreciable and objectionable loss of detail.

**4.3 Documents for Final Payment.** Prior to the receipt of D-BE's final payment, D-BE shall forward to District all of the following: (1) one clear and legible set of reproductions of the computations; (2) the original copy of the specifications; (3) the As-Built Drawings and Specifications as required herein; and (4) D-BE's Certificate of Completion.

## **5. WARRANTY PERIOD.**

During the warranty period phase of the Project, D-BE shall do all of the following, as well as any incidental services thereto:

**5.1 Advice.** D-BE shall provide advice to District on apparent deficiencies in the Project during any applicable warranty periods for the Project.

**EXHIBIT "B"**  
**FEE AND PHASING/FUNDING SCHEDULES**

**6. FEE SCHEDULE.**

D-BE will invoice District on a monthly cycle based on the following fee schedule. D-BE will include with each invoice a detailed progress report that indicates the amount of budget spent on each phase and the total amount spent against the Total Compensation. D-BE will inform District regarding any out-of-scope work being performed by D-BE for which D-BE intends to seek compensation from District.

*[Insert fee schedule}*

**EXHIBIT "C"**

**COMPENSATION RATES AND REIMBURSABLE EXPENSES**

1. **HOURLY COMPENSATION RATES.** [Insert D-BE fee schedule.]
2. **REIMBURSABLE EXPENSES.**
3. **ADDITIONAL SERVICES.**

Additional Services shall be computed at the actual hourly rates listed above.

4. **ADDITIONAL CONSULTANTS.**

If District requires D-BE to hire Consultants to perform any Additional Services, D-BE shall be compensated therefore at the D-BE's actual hourly rates plus a markup of **[INSERT AMOUNT OR PERCENTAGE]**. District shall have the authority to review and approve the rates of any such Consultant.

# **APPENDIX A**

## RFP Acknowledgement Form

**RFP Acknowledgement Form**

**FOR**

**DESIGN-BUILD SERVICES FOR**

**THE GREAGLE CREEK PEDESTRIAN BRIDGE**

Request for Proposal No: **2023**

Send to:	Daniel Bastian
Email Address	<a href="mailto:Bastianengineeringinc@gmail.com">Bastianengineeringinc@gmail.com</a>

Respondent (Company):	
Address:	
Contact Person:	
Email Address	
Telephone Number:	
Fax Number:	

I, hereby, acknowledge receipt of the RFP for the project mentioned above.

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Date: \_\_\_\_\_

# **APPENDIX B**

Site Visit Acknowledgement Form

## **Site Visit Acknowledgement Form**

**FOR**

### **DESIGN-BUILD SERVICES FOR THE GREAGLE CREEK PEDESTRIAN BRIDGE**

**Request for Proposal No: 2023**

Send to:	Daniel Bastian
Email Address	Bastianengineeringinc@gmail.com

Respondent (Company):	
Address:	
Contact Person:	
Email Address:	
Telephone Number:	
Fax Number:	

I, hereby, declare that we, the Respondent, have undertaken a site visit for the purposes noted in the RFP document.

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Date: \_\_\_\_\_

# **APPENDIX C**

CEQA NOTICE OF DETERMINATION, GCSD RESOLUTION AND MITIGATION  
MONITORING AND REPORTING PROGRAM

## NOTICE OF DETERMINATION

To: Plumas County Clerk-Recorder  
520 Main Street Room 102  
Quincy, CA 95971

From:  
Graeagle Community Services District  
P.O. Box 1414  
Graeagle, CA 96103  
Contact: Daniel B. Bastian, Project Engineer

**SUBJECT: Filling of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code**

**Project Title:** Graeagle Creek Pedestrian Bridge Project

**Project Location:** Graeagle Community Services District (GCSD). The proposed bridge is located in the town of Graeagle, California at the Graeagle Creek Crossing, just north of the vehicle bridge on State Route 89 (SR 89).

**Project Description:** GCSD is proposing to construct a pedestrian bridge over Graeagle Creek. The proposed bridge is located in an unincorporated mountainous area of Mohawk Valley, within the town of Graeagle, California. The project site is located at Graeagle Creek.

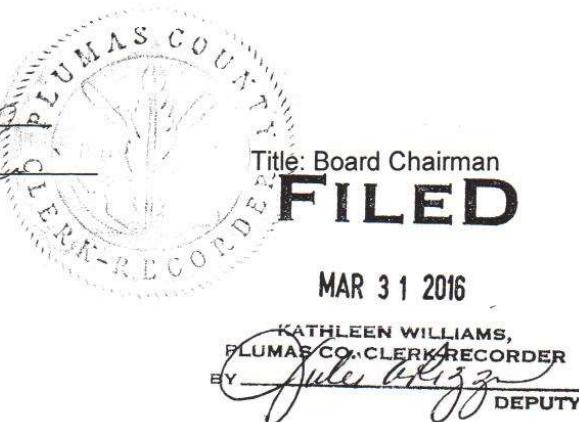
This is to advise that the Graeagle Community Services District has approved the above described project on March 23, 2016 and has made the following determinations regarding the above described project:

1. The project will not have a significant effect on the environment.
2. A Negative Declaration was prepared for this project pursuant to CEQA.
3. Mitigation measures were made a condition of the approval of the project.
4. A mitigation and reporting or monitoring plan was adopted for this project.
5. A statement of Overriding Considerations was not adopted for this project.
6. Findings were made pursuant to the provisions of CEQA.

This is to certify that the final Negative Declaration, with comments and responses and record of project approval, is available to the public at Graeagle Community Services District, P.O. Box 1414 Graeagle, CA 96103.

Signature:   
Date: March 23, 2016

Receipt # 32-2016-016  
Doc# 2016-016





State of California - Department of Fish and Wildlife  
**2016 ENVIRONMENTAL FILING FEE CASH RECEIPT**  
DFW 753.5a (Rev. 12/15/15) Previously DFG 753.5a

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

RECEIPT NUMBER:  
32 — 03312016 — 16  
STATE CLEARINGHOUSE NUMBER (If applicable)

LEAD AGENCY <b>GRAEAGLE COMMUNITY SERVICE DIST</b>	LEAD AGENCY EMAIL	DATE <b>03/31/2016</b>
COUNTY/STATE AGENCY OF FILING <b>Plumas</b>		DOCUMENT NUMBER <b>2016-016</b>

PROJECT TITLE

**GRAEAGLE CREEK PEDESTRIAN BRIDGE PROJECT**

PROJECT APPLICANT NAME <b>GRAEAGLE COMMUNITY CSD</b>	PROJECT APPLICANT EMAIL	PHONE NUMBER <b>(530) 249-0468</b>
PROJECT APPLICANT ADDRESS <b>STATE ROUTE 89 (SR89)</b>	CITY <b>GRAEAGLE</b>	STATE <b>CA</b> ZIP CODE <b>96103</b>

PROJECT APPLICANT (Check appropriate box)

<input checked="" type="checkbox"/> Local Public Agency	<input type="checkbox"/> School District	<input type="checkbox"/> Other Special District	<input type="checkbox"/> State Agency	<input type="checkbox"/> Private Entity
---	--	---	---------------------------------------	---

CHECK APPLICABLE FEES:

<input type="checkbox"/> Environmental Impact Report (EIR)	\$3,070.00	\$ 0.00
<input checked="" type="checkbox"/> Mitigated/Negative Declaration (MND)(ND)	\$2,210.25	\$ 2,210.25
<input type="checkbox"/> Certified Regulatory Program document (CRP)	\$1,043.75	\$ 0.00

Exempt from fee  
 Notice of Exemption (attach)  
 CDFW No Effect Determination (attach)  
 Fee previously paid (attach previously issued cash receipt copy)

<input type="checkbox"/> Water Right Application or Petition Fee (State Water Resources Control Board only)	\$850.00	\$ 0.00
<input checked="" type="checkbox"/> County documentary handling fee	\$	\$ 50.00
<input type="checkbox"/> Other	\$	\$

PAYMENT METHOD:

<input type="checkbox"/> Cash	<input type="checkbox"/> Credit	<input checked="" type="checkbox"/> Check	<input type="checkbox"/> Other	TOTAL RECEIVED \$ 2,260.25
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SIGNATURE

AGENCY OF FILING PRINTED NAME AND TITLE

Julie A. Rizzo - Lead Dept Clerk-Recorder

**RESOLUTION NO. #2016 - 1**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE GRAEAGLE  
COMMUNITY SERVICES DISTRICT APPROVING MITIGATED NEGATIVE  
DECLARATION #2016-1 FOR GRAEAGLE CREEK PEDESTRIAN BRIDGE PROJECT**

WHEREAS, the Graeagle Community Services District has completed Initial Study/Mitigated Negative Declaration #2016-1 pursuant to the California Environmental Quality Act (CEQA) and the CEQA Guidelines for the GRAEAGLE CREEK PEDESTRIAN BRIDGE PROJECT; and

WHEREAS, the project will improve the safety and function of an existing State Route 89 by constructing a pedestrian bridge adjacent thereto

WHEREAS, the Graeagle Community Services District has fully complied with all noticing and outreach obligations established under CEQA and Guidelines for an adequate CEQA process and has determined that the Mitigated Negative Declaration contains all requisite components for an adequate CEQA record and fully complies with the requirements of CEQA providing an adequate environmental basis for informed decision making; and

WHEREAS, the Graeagle Community Services District has considered the proposed mitigated negative declaration, together with any comments received during the public review process, and

WHEREAS, the Mitigated Negative Declaration, with any comments and responses and record of project approval (upon which its decision was based), are available to the public at the Graeagle Community Services District; and

WHEREAS, the Graeagle Community Services District adopted a program for reporting on, or monitoring of the changes which are required in the project to mitigate or avoid less than significant environmental effects; and

WHEREAS, the Mitigated Negative Declaration reflects the Graeagle Community Services District's independent judgment and analysis; and

WHEREAS, on the basis of the whole record before it (including the initial study and any comments received) there is no substantial evidence that the project will have a significant effect on the environment.

NOW, THEREFORE, BE IT RESOLVED, FOUND, DETERMINED, AND ORDERED by the Board of Directors of the Graeagle Community Services District, that based on the entire record before the Board of Directors, all written and oral evidence presented to the Board of Directors, and the findings made in this resolution, the Graeagle Community Services District hereby:

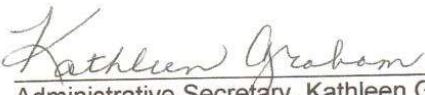
1. Certifies that the GRAEAGLE CREEK PEDESTRIAN BRIDGE PROJECT Mitigated Negative Declaration is adequate.
2. Finds that the project will not have a significant effect on the environment.
3. Certifies that the documents have been prepared in compliance with the provisions of the California Environmental Quality Act (CEQA), the State CEQA Guidelines, and the Graeagle Community Services District implementing procedures for CEQA.
4. Finds that the adoption of the Mitigated Negative Declaration reflects the independent judgment of the Board of Directors.

PASSED, APPROVED AND ADOPTED this 23rd day of March 2016 by the following vote:

AYES: Tom Balestri, Candy Caskie, Annie Fischer, Bill Keese and Ardy Paulsen  
NOES: None  
ABSENT: None  
ABSTAIN: None

  
\_\_\_\_\_  
Board Chairman, Tom Balestri

I, Kathleen Graham, secretary for the Board of Directors, do certify that the above and forgoing Resolution was duly passed and adopted by the Board of Directors for the Graeagle Community Services District at the regular meeting thereof held on March 23, 2016.

  
\_\_\_\_\_  
Administrative Secretary, Kathleen Graham

## MITIGATION MONITORING AND REPORTING PROGRAM

The Mitigation Monitoring and Reporting Program (MMRP) is a CEQA-required component of the Mitigated Negative Declaration (MND) process for the project. The results of the environmental analyses, including proposed mitigation measures, are documented in the Final MND.

CEQA requires that agencies adopting MNDs take affirmative steps to determine that approved mitigation measures are implemented subsequent to project approval.

As part of the CEQA environmental review procedures, Section 21081.6 requires a public agency to adopt a monitoring and reporting program to ensure efficacy and enforceability of any mitigation measures applied to a proposed project. The lead agency must adopt a MMRP for mitigation measures incorporated into the project or proposed as conditions of approval. The MMRP must be designed to ensure compliance during project implementation. As stated in Section 21081.6(a)(1):

*"The public agency shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation. For those changes which have been required or incorporated into the project at the request of a responsible agency or a public agency having jurisdiction by law over natural resources affected by the project, that agency shall, if so requested by the lead agency or a responsible agency, prepare and submit a proposed reporting or monitoring program."*

**Table 1** is the final MMRP matrix. The table lists each of the mitigation measures proposed in the Final MND and specifies the agency responsible for implementation of the mitigation measure and the time period for the mitigation measure.

**Table 1: Mitigation Monitoring and Reporting Program**

Environmental Impact	Mitigation Measures	Responsible Agency	Timing
Air Quality	<p><b>Mitigation Measure AIR-1:</b> The project contractor, on behalf of Graeagle Community Services District, shall prepare a dust control plan for construction activities at the project site pursuant to the requirements of the NSAQMD. The project contractor shall be responsible for ensuring that all adequate dust control measures are implemented in a timely manner during all phases of construction and maintenance activities at the project site. The dust control plan shall include, at a minimum, the following measures:</p> <ul style="list-style-type: none"><li>► All visibly dry disturbed soil roads surfaces shall be watered to minimize fugitive dust emissions.</li><li>► All unpaved surfaces, unless otherwise treated with suitable chemicals or oils, shall have a posted speed limit of 10 miles per hour.</li><li>► Earth or other material that has been transported by trucking or earth moving equipment, erosion by water, or other means onto paved streets shall be promptly removed.</li><li>► Asphalt, oil, water or suitable chemicals shall be applied on materials stockpiles, and other surfaces that can give rise to airborne dusts.</li><li>► All earthmoving activities shall cease when sustained winds exceed 15 miles per hour.</li><li>► The operator shall take reasonable precautions to prevent the entry of unauthorized vehicles onto the site during non-work hours.</li><li>► The operator shall keep a daily log of activities to control fugitive dust.</li><li>► Precautions shall be taken to prevent transported material from becoming airborne. Such precautions may include covering or applying water on the transported material.</li></ul>	Graeagle Community Services District	During project design. Incorporation into bid documents.
Air Quality; Expose sensitive receptors to substantial pollutant concentrations?	<p><b>Mitigation Measure AIR-2:</b> If serpentine rock is found in the area, the presence of asbestos, in the chrysotile or amphibole forms shall be determined, and mitigation on a site-specific basis shall be identified. Construction Plans for this project shall include a note stating: "If serpentine, ultramafic rock or naturally occurring asbestos is discovered during any grading or construction activity, work shall stop immediately and the Northern Sierra Air Quality Management District shall be contacted to determine compliance with the approved Airborne</p>	Graeagle Community Services District	During project design. Incorporation into bid documents.

**Table 1: Mitigation Monitoring and Reporting Program**

<b>Environmental Impact</b>	<b>Mitigation Measures</b>	<b>Responsible Agency</b>	<b>Timing</b>
Toxic Control Measures for naturally occurring asbestos.	Although it is unlikely that NOA would be encountered during construction activities, implementation of Mitigation Measure AIR-2 would ensure that NOA emissions would be minimized and this impact would remain less than significant.	Graaeagle Community Services District	Prior to project construction
<b>Biological Resources</b>	<p><b>Mitigation Measure BIO-1:</b> A focused survey to determine if daytime or maternal roosting by pallid bats is taking place at the bridge shall be conducted by a qualified biologist within 15 days prior to commencement of construction-related activities. If no active roosts are found, no further action will be necessary.</p> <p>If either a daytime or maternity roosting is documented, the GCSD shall consult with CDFW regarding biological significance of the bat population and appropriate measures to exclude bats from roosting under the bridge. Suitable exclusionary materials may include netting, poly sheeting, foam filling (for crevices), or other mechanical devices. If deemed necessary, the GCSD or its construction contractor shall implement those measures recommended by CDFW prior to construction.</p> <p><b>Mitigation Measure BIO-2:</b> The only species that would potentially nest in the area is the willow flycatcher.</p> <p>If the project involves construction work during the breeding season for willow flycatcher (<i>Empidonax traillii</i>; generally June to August), then a protocol-level survey will be conducted during the same year as the construction activity. If migratory birds are found during protocol-level surveys either the project shall avoid the breeding season or GCSD must apply for an Incidental Take Permit (ITP) under the California Endangered Species Act. A Willow Flycatcher Survey Protocol for California (HL Bombay et al., 5/2003) which can be found on our website here: <a href="http://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html">http://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html</a> will be applied. The protocol requires a minimum of 2 separate surveys during specific time frames between June 1 and July 15. Any construction activity</p>	Graaeagle Community Services District	Prior to project construction

**Table 1: Mitigation Monitoring and Reporting Program**

<b>Environmental Impact</b>	<b>Mitigation Measures</b>	<b>Responsible Agency</b>	<b>Timing</b>
	<p>that occurs between August 1 and March 14, outside the nesting season, shall not require preconstruction surveys.</p> <p>Willow flycatcher (WIFL) is listed as endangered (January 2, 1991), pursuant to CESA. Habitat for this species is characterized by willow (<i>Salix spp.</i>) or alder (<i>Alnus spp.</i>) thickets adjacent to permanent water such as low-gradient streams, ponds, marshes or wet meadows within or adjacent to forested habitat. WIFL are typically found to breed in riparian areas with shrub thickets interspersed with openings such as moist meadows.</p> <p>GCS shall employ the following standard Protection measures to prevent significant negative effects to WIFL and to avoid unauthorized take of the species:</p> <p>The Project Area and its vicinity (within 500 feet) shall be surveyed by a CDFW-approved biologist for presence of suitable WIFL habitat. If habitat is present, protocol-level surveys shall be completed before operations begin to determine if WIFL are present. The currently accepted survey protocol is "A Willow Flycatcher Survey Protocol for California".</p> <p>If current-year surveys (per the protocol) determine the presence of WIFL, the following additional measures shall be followed:</p> <p>The project shall be re-designed with approval from the CDFW to completely avoid "take" of this listed species as described in Condition 1.5 and FGC 86.</p> <p>No operations shall occur during the breeding season (June 1st through August 31st) within an appropriate distance as determined by a qualified biologist in consultation with the CDFW to avoid disturbance of WIFL. A biological monitor shall be present during all construction activity during the breeding season or until young have fledged.</p> <p>Any operations conducted within or adjacent to suitable WIFL habitat where WIFL have been found shall not damage or destroy willows or other riparian</p>		

Environmental Impact	Mitigation Measures	Responsible Agency	Timing
vegetation.	<p>The GCSD shall retain a qualified biologist to conduct preconstruction surveys to identify active yellow warbler or other migratory bird nests within and immediately adjacent to the AREA OF CONCERN. Preconstruction surveys shall be conducted during the nesting season (April 1 through July 31) no more than 15 days before any construction activity begins. If no nests are found, the results of the survey shall be documented in a report to the GCSD, and no further action is required. Any construction activity that occurs between August 1 and March 14, outside the nesting season, shall not require preconstruction surveys.</p> <p>If nests are located, impacts shall be avoided by establishing 250-foot or other appropriate buffers around active nests; and no new project activity shall occur within the buffer areas until the young have fledged, until the nest is no longer active, or until a qualified biologist has determined in consultation with CDFW that reducing the buffer would not result in nest abandonment. Monitoring of the nest by a qualified biologist during construction activities shall be required to ensure that nests are not jeopardized.</p>	Graegle Community Services District	Prior to project construction
	<p><b>Mitigation Measure BIO-3:</b> Sierra Nevada Yellow-legged frog</p> <p>Prior to the commencement of project activities, GCSD or contractor thereof shall conduct a minimum of three (3) amphibian surveys during July and August between the hours of 10 am and 4 pm in good weather. If the weather is too cold or stormy, Visual Encounter Survey (VES) can be inaccurate and shall not be conducted when temperatures are below sixty degrees Fahrenheit (60°F). Surveys will be conducted using Amphibian VES protocols.</p>		Two surveyors, experienced with surveying SNYLF and approved by the CDFW, will conduct surveys starting 100' upstream of the Area of Concern and ending one (1) mile downstream from the project activities at the MFR. VES shall be conducted on all inlets and outlets, ponded water, and other wetland habitat types within a half-mile radius of the drainage where project

**Table 1: Mitigation Monitoring and Reporting Program**

Environmental Impact	Mitigation Measures	Responsible Agency	Timing
	<p>activities are occurring and any tributaries to that drainage, where feasible. Meadow or marsh sites should be surveyed systematically with multiple surveyors in an effort to survey the entire site. When access is restricted, the report should identify the limitations and analyze the potential of the limitations to affect the validity of the survey results.</p> <p>To conduct an amphibian survey, the surveyors will walk slowly around the perimeter of the site, or along and within the stream, counting the number of adults, sub-adults, metamorphs, larvae, and egg masses of each species. The pace of the walking should be slower than a leisurely stroll. Surveyors will pause often to look ahead for basking animals and amplexing adults. Dip nets will be used to sweep habitat and banks in an effort to spook animals. Survey duration, start and end times, weather, water and air temperature, and location will be recorded every half-mile. As needed, use the sterilized D-net or aquarium net to catch amphibians and reptiles for identification. All equipment including waders, boots or nets shall be sterilized to prevent spread of chytrid Batrachochytrium dendrobatidis.</p> <p>Global Positioning System (GPS) locations will be taken of all animals and egg masses encountered. Photos will be taken of all egg masses as well other adults and sub-adults when possible.</p> <p>Protocols referenced are "California Department of Fish and Game (2010) HML-Fish/Amphibian Survey Protocols, pp. 6-8"; and "Fellers GM, Freel KL (1995) A Standardized Protocol for Surveying Aquatic Amphibians, United States Department of Interior and the University of California."</p> <p>The results of the surveys shall be submitted to the CDFW five (5) days after the completion of the surveys and thirty (30) days prior to the commencement of project activities for approval. The project shall not begin until the CDFW reviews and approves the results of the surveys.</p> <p>If results are positive or inconclusive, then the project shall be re-designed with approval from the CDFW to completely avoid "take" of this listed species</p>		6

**Table 1: Mitigation Monitoring and Reporting Program**

Environmental Impact	Mitigation Measures	Responsible Agency	Timing
Biological Resources: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	<p>as described in FGC 86. The re-design of the project to avoid the species may include, but is not limited to, no diversion of water, no dewatering, no vegetation removal, no construction activities within five hundred (500) feet of the stream or waterbody, and no impacts to waters of the State. If “take” cannot be completely avoided, then an incidental Take Permit (see FGC 2081 et seq.) should be obtained from the Department.</p> <p><b>Mitigation Measure Bio-4:</b> To avoid and minimize potential impacts to Graeagle Creek, the GCSD shall submit a Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) to determine if a Stormwater Pollution Prevention Plan (SWPPP) and/or other water quality control plans are required and comply with all conditions required as a result of the permitting process in accordance with the regulatory agency guidance for protecting water quality. In addition, the GCSD shall obtain the following permits and abide by all permit conditions:</p>	Graeagle Community Services District	Prior to project construction

► Section 404 Permit, USACE Nationwide Permit (NWP) #14 Permit (Linear Transportation Projects), for potential impacts to waters of the United States or wetlands adjacent to Graeagle Creek. 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 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.

NWP #14 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

**Table 1: Mitigation Monitoring and Reporting Program**

<b>Environmental Impact</b>	<b>Mitigation Measures</b>	<b>Responsible Agency</b>	<b>Timing</b>
	<p>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.</p> <p>Notification: Regional Condition 2 for the Nationwide Permits states that for all NWP's, the permittee shall submit a Pre-Construction Notification in accordance with General Condition 31 and Regional Condition 1, in the following circumstances: 2c. "For all crossings of perennial waters and intermittent waters." The Graeagle Creek project will require a Pre-Construction Notification (including a delineation) if there is a discharge of fill material as a result of the crossing of Graeagle Creek. The Regional conditions added additional requirements on the NWP's when they were issued in 2012.</p> <ul style="list-style-type: none"> <li>► Water quality certification from the RWQCB, Central Valley Region, pursuant to Section 401 of the CWA to ensure the project is consistent with the state's water quality standards and criteria.</li> <li>► Streambed Alteration Agreement from CDFW, Region 2, for all modifications to the bed and bank of Graeagle Creek and implement all measures outlined in the agreement.</li> </ul> <p><b>Mitigation Measure Bio-5:</b> The following measures shall be implemented to avoid and minimize impacts to riparian woodland habitat:</p> <ul style="list-style-type: none"> <li>► Avoid temporary or permanent disturbance to riparian vegetation to the maximum extent possible through project planning and design.</li> <li>► Obtain a Streambed Alteration Agreement from CDFW, Region 2, for all modifications to the bed and bank of Graeagle Creek, including riparian tree removal, and implement all measures outlined in the agreement, including any requirements for replacement plantings.</li> <li>► If directed by CDFW, install protective fencing around riparian vegetation that is not planned for removal to prohibit inadvertent disturbance to these areas.</li> </ul>	Graeagle Community Services District	Prior to project construction
Biological Resources; Have a	<b>Mitigation Measure Bio-6:</b> The following measures to avoid and minimize	Graeagle Community	During project

**Table 1: Mitigation Monitoring and Reporting Program**

<b>Environmental Impact</b>	<b>Mitigation Measures</b>	<b>Responsible Agency</b>	<b>Timing</b>
substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<p>impacts to freshwater marsh shall be implemented:</p> <ul style="list-style-type: none"> <li>► Avoid disturbance to freshwater marsh vegetation to the maximum extent possible by design, planning and implementing appropriate BMPs.</li> <li>► Contain bridge construction activities, grading, staging, and all other construction activities within the planned work area to avoid disturbance of the freshwater marsh area.</li> <li>► Install protective fencing around freshwater marsh vegetation to prohibit inadvertent disturbance to this area.</li> <li>► Educate contractors and subcontractors on the applicable BMPs implemented for this project.</li> </ul>	Services District	design. Incorporation into bid documents.
Cultural Resources	<p><b>Mitigation Measure CUL-1:</b> Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?</p> <p>Cultural Resources: If deposits of prehistoric or historical archaeological materials are discovered during non-monitored project activities, all work within 25 feet of the discovery shall be redirected and a qualified archaeologist contacted, if one is not present, to assess the situation. The construction contractor shall consult with agencies as appropriate to make recommendations for the treatment of the discovery. Graeagle Community Services District Department of Public Works shall also be notified. Project personnel shall not collect or move any archaeological materials.</p> <p>It is recommended that adverse effects to the finds be avoided by project activities. If avoidance is not feasible, the archaeological deposits shall be evaluated by a qualified archaeologist to determine if the resource qualifies as a historical resource or unique archaeological resource, or as historic property. If the deposits do not so qualify, avoidance is not necessary. If the deposits qualify, adverse effects on the deposits shall be avoided, or effects shall be mitigated. Mitigation may consist of, but is not limited to, recovery and analysis of the archaeological deposit; recording of the resource; preparation of a report of findings; and accessioning recovered archaeological materials at an appropriate curation facility. Upon completion of the assessment, the archaeologist shall prepare a report documenting the methods and results, and provide recommendations for the treatment of the</p>	Graeagle Community Services District	During project design. Incorporation into bid documents.

Environmental Impact	Mitigation Measures	Responsible Agency	Timing
Cultural Resources: Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<p><b>Mitigation Measure CUL-2:</b> If paleontological resources are encountered during project construction, all ground-disturbing activities shall be redirected within 50 feet of the find until a qualified paleontologist can be contacted to evaluate the find and make recommendations. If the professional paleontologist determines that the paleontological resource is significant and project activities cannot avoid the resource, a paleontological evaluation and monitoring plan shall be implemented. The plan shall include measures to mitigate adverse effects to paleontological resources, which may include monitoring, data recovery and analysis, reporting, and the curation of all fossil material in a paleontological repository. Upon completion of project ground-disturbing activities, a report documenting methods, findings, and a recommendations shall be prepared and submitted to the paleontological repository and a copy provided to Graeagle Community Services District.</p> <p><b>Mitigation Measure CUL-3:</b> In the event that human remains are encountered during project construction, work within 50 feet of the discovery shall be redirected and the Plumas County Coroner shall be notified immediately. At the same time, a qualified archaeologist shall be contacted to assess the situation and consult with agencies as appropriate. Project personnel shall not collect or move any human remains and associated materials. If the human remains are of Native American origin, the Coroner shall notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission shall identify a Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and any associated grave goods. Upon completion of the assessment, the archaeologist shall prepare a report documenting the methods and results, and provide recommendations for the treatment of the human remains and any associated cultural materials, as appropriate and in coordination with the recommendations of the MLD. The report shall be submitted to the Graeagle Community Services District.</p>	Graeagle Community Services District	During project design. Incorporation into bid documents.
Greenhouse Gas Emissions			10

**Table 1: Mitigation Monitoring and Reporting Program**

<b>Environmental Impact</b>	<b>Mitigation Measures</b>	<b>Responsible Agency</b>	<b>Timing</b>
Greenhouse Gas Emissions: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<p><b>Mitigation Measure GHG-1:</b> To the extent feasible and to the satisfaction of Graeagle Community Services District, the following measures shall be incorporated into the design and construction of the project:</p> <ul style="list-style-type: none"><li>► On-site idling of construction equipment shall be minimized (no more than 5 minutes maximum);</li><li>► Biodiesel shall be used as an alternative fuel to diesel for at least 15 percent of the construction vehicles/equipment used if there is a biodiesel station within 5 miles of the project site;</li><li>► At least 10 percent of building materials shall be local to the extent feasible; and</li><li>► At least 50 percent of construction waste or demolition materials shall be recycled.</li></ul>	Graeagle Community Services District	During project design. Incorporation into bid documents.
Hazards and Hazardous Materials	<p><b>Mitigation Measure HAZ-1:</b> In accordance with the Plumas County Hazardous Materials Response Plan, the project contractor shall prepare and implement a Spill Prevention and Countermeasure Plan (SPCP) prior to the commencement of construction activities. The SPCP shall include information on the nature of all hazardous materials that will be used on-site. The SPCP shall also include information regarding proper handling of hazardous materials, and clean-up procedures in the event of an accidental release. The phone number of the Plumas County Environmental Health Department overseeing hazardous materials and toxic clean-up shall be provided in the SPCP.</p> <p>The best available technology in Best Management Practices (BMPs) to reduce sedimentation, erosion, water pollution, and dust to the greatest extent practicable shall be employed on all work sites during construction. In areas where wetlands are within 250 feet of the construction activities, erosion control measures and construction fencing shall be emplaced, monitored for effectiveness, and maintained throughout the construction operations.</p>	Graeagle Community Services District	During project design. Incorporation into bid documents.

**Table 1: Mitigation Monitoring and Reporting Program**

Environmental Impact	Mitigation Measures	Responsible Agency	Timing
Prior to working near wetlands and other waters of the U.S., all heavy equipment operated adjacent to these areas shall be closely examined for oil and fuel discharges. All equipment, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering the vernal pool areas. Any of these materials placed within or where they may enter the wetland habitats shall be removed immediately. Regulating agencies shall be notified immediately if a spill occurs, and shall provide consultation regarding clean-up procedures.	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 aquatic life, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering the wetlands and other waters of the U.S. Any of these materials placed within or where they may enter these areas shall be removed immediately.	Graeagle Community Services District	During project design. Incorporation into bid documents.
Hydrology and Water Quality  Hydrology and Water Quality: Violate any water quality standards or waste discharge requirements?	<b>Mitigation Measure HYDRO-1:</b> The Graeagle Community Services District shall require the project contractor to prepare and implement construction site temporary BMPs in compliance with the provisions of the Caltrans Statewide NPDES Permit and any subsequent permit pertaining to construction of the proposed project. The Graeagle Community Services District shall submit a Notice of Construction (NOC) to the Central Valley RWQCB at least 30 days prior to the start of construction and shall submit a Notice of Termination (NOT) to the Central Valley RWQCB upon completion of construction and stabilization of the project site. The GCSD shall require the construction contractor to install the temporary prior to any construction operations and to maintain them and keep them in good condition for the duration of the contract. The removal of these BMPs will be the final operation, along with the project site cleanup.  <b>Mitigation Measure HYDRO -2:</b> The Graeagle Community Services District shall incorporate Design Pollution		12

Environmental Impact	Mitigation Measures	Responsible Agency Timing
	<p>Prevention (DPP) and Treatment Control BMPs into the final project design in accordance with the procedures outlined in the Stormwater Quality Handbooks, Project Planning and Design Guide. The Graesagle Community Services District shall coordinate with the Central Valley RWQCB with respect to feasibility, maintenance, and monitoring of Treatment Control BMPs as set forth in Caltrans' Statewide Stormwater Management Plan (SWMP). The DPPs and BMPs shall be part of the construction bid package and implementation of the measures as intended shall be a condition of the construction contract.</p> <p><b>Mitigation Measure HYDRO -3:</b></p> <p>During dewatering activities, if necessary the provision of the General Waste Discharge requirements for discharges to surface waters that pose an insignificant (<i>de minimus</i>) threat to water quality, Order No. RS-2013-0074 NPDES No. CAG998001, as they relate to construction activities for the project shall be followed by the construction contractor. If the dewater discharge goes to land, then Order 2003-003-DWQ provisions are required. A Notice of Intent (NOI) shall be submitted to the Central Valley RWQCB at least three months prior to the start of dewatering. The Graesagle Community Services District shall ensure that the construction contractor complies with all applicable provisions in the de minimus permit, including water sampling, analysis, and reporting of dewatering-related discharges. Compliance with these conditions shall be part of the construction bid package.</p>	

## **APPENDIX D**

California Department of Fish and Wildlife has issued a Stream Alteration Permit



California Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
North Central Region  
1701 Nimbus Road, Suite A  
Rancho Cordova, CA 95670-4599  
916-358-2900  
[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

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



**MAY 05 2016**

Date

Tom Balestri  
Graeagle Community Services District  
B.O. Box 1414  
Graeagle, CA 96103

Subject: Final Lake or Streambed Alteration Agreement  
Notification No. 1600-2014-0284-R2  
Graeagle Creek Pedestrian Bridge

Dear Mr. Balestri:

Enclosed is the final Streambed Alteration Agreement (Agreement) for the Graeagle Creek Pedestrian Bridge (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) within five working days of signing the Agreement. The NOD was based on information contained in the Mitigated Negative Declaration prepared by the lead agency.

Under CEQA, the filing of an NOD triggers a 30-day statute of limitations period during which an interested party may challenge the filing agency's approval of the Project. You may begin the Project before the statute of limitations 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 Tanya Sheya, Environmental Scientist at (916) 358-2953 or [Tanya.Sheya@wildlife.ca.gov](mailto:Tanya.Sheya@wildlife.ca.gov).

Sincerely,

Tina Bartlett  
Regional Manager

cc: Tanya Sheya, [Tanya.Sheya@wildlife.ca.gov](mailto:Tanya.Sheya@wildlife.ca.gov)  
Daniel Bastian, [bastianengineeringinc@gmail.com](mailto:bastianengineeringinc@gmail.com)

*Conserving California's Wildlife Since 1870*

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



**STREAMBED ALTERATION AGREEMENT**  
NOTIFICATION No. 1600-2014-0284-R2  
GRAEAGLE CREEK

GRAEAGLE COMMUNITY SERVICES DISTRICT  
GRAEAGLE CREEK PEDESTRIAN BRIDGE

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (Department) and Graeagle Community Services District (the Permittee) as represented by Tom Balestri.

**RECITALS**

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, the Permittee notified the Department on November 21, 2014, that the 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, the Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

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

**PROJECT LOCATION**

The project is located at Graeagle Creek a tributary to the Middle Fork Feather River, in the County of Plumas, State of California; Latitude 39° 45' 54.26"N, Longitude 120° 37' 1.21"W; Township 22N, Range 12E, Section 15, of the Blairsden U.S. Geological Survey (USGS) Quadrangle.

**PROJECT DESCRIPTION**

The project is limited to the installation of a pedestrian bridge over Graeagle Creek. Construction will include two bridge abutment, pedestrian approaches and a bridge structure. The abutment will be concrete-cantilever footing with concrete wing-walls. The footings will extend approximately 10-feet below the existing grade. The approaches will be imported fill with an asphalt or concrete walking surface. No fill material will be placed in the active channel and no equipment will work in the active channel. The bridge structure, approximately 150-feet long and 12-feet wide, will be

placed by crane from one or both sides of the creek. Work will require trimming vegetation, but no trees will be removed.

## PROJECT IMPACTS

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

The adverse effects the project could have on the fish or wildlife resources identified above include: soil compaction or other disturbance to soil layer, temporary release of contaminants (i.e. incidental from construction), disruption to nesting birds, reptiles and other wildlife.

## MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

### 1. Administrative Measures

The Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. The 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. The 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 the Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.
- 1.3 Notification of Conflicting Provisions. The Permittee shall notify the Department if the 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 the Permittee to resolve any conflict.
- 1.4 Project Site Entry. The Permittee agrees that the Department personnel may enter the project site at any time to verify compliance with the Agreement.
- 1.5 Notification of Project Modification. The Permittee agrees to notify the Department of any modifications made to the project plans submitted to the Department.
- 1.6 Change of Conditions and Need to Cease Operations. If conditions arise, or change, in such a manner as to be considered deleterious to the stream or wildlife, operations shall cease until corrective measures approved by the Department are taken.

- 1.7 **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, 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, the Permittee shall implement each measure listed below.

- 2.1 **Work Period.** Work shall be timed during the driest time within the channel. If water is present at the time of in water construction, water shall be diverted around the work area and work shall begin after the site is dry. The time period for completing the work shall be confined to the period between August 1<sup>st</sup> and November 15<sup>th</sup> of the same calendar year during the term of this Agreement. Work within the dry portion of the stream shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities within the stream shall cease until all reasonable erosion control measures, have been implemented prior to all storm events. Construction equipment and material shall be removed from the floodplain if inundation is likely. Revegetation, restoration and erosion control work is not confined to this time period.
- 2.2 **Work Period Modification.** If the Permittee needs more time to complete the project activity, the work may be permitted outside of the work period and extended on a day-to-day basis (or for some other set period of time) by the Department representative who reviewed the project, or if unavailable, through contact with the Regional office (see Contact Information). The Permittee shall submit a written request for a work period variance to the Department. The work period variance request shall: 1) describe the extent of work already completed; 2) detail the activities that remain to be completed; 3) detail the time required to complete each of the remaining activities; and 4) provide photographs of both the current work completed and the proposed site for continued work. The work period variance request should consider the effects of increased stream flows, rain delays, increased erosion control measures, limited access due to saturated soil conditions, and limited growth of erosion control grasses due to cool weather. Work period variances are issued at the discretion of the Department. The Department will review the written request to work outside of the established work period. The Department will have ten calendar days to review the proposed work period variance. The Department reserves the right to require additional measures to protect fish and wildlife resources as a condition for granting the variance.
- 2.3 **Vegetation Removal.** Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. No native trees with a trunk diameter at breast height (DBH) in excess of four (4) inches shall be removed or damaged during construction. Where native trees or woody riparian vegetation split into

several trunks close to ground level, the DBH shall be measured for each trunk and calculated as one tree. Using hand tools (clippers, chain saw, etc.), trees may be trimmed to the extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the riparian zone and stream channel.

- 2.4 **Bird Nests.** 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 February 15<sup>th</sup> to August 31<sup>st</sup>) then a breeding bird survey will be conducted no more than 15 days prior to the start of construction by a Department approved biologist. 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.
- 2.5 **Stabilize Exposed Areas.** The Permittee shall take precautions to minimize turbidity/siltation during construction and post-construction periods. Precautions shall include, but are not limited to: best management erosion control practices to stabilize all exposed/disturbed areas within the project site to the greatest extent possible.
- 2.6 **Sediment Control.** Precautions to minimize turbidity/siltation shall be taken into account during project planning and implementation. This may require the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches. **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.**

Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures shall be taken. The sediment barrier(s) shall be maintained in good operating condition throughout the construction period and the following rainy season. Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged silt fencing, coir logs, coir rolls, and/or straw bale dikes. Upon the Department's determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation shall be halted until effective Department approved control devices are installed or abatement procedures are initiated.

- 2.7 **Removal of Silt Barrier.** The Permittee is responsible for the removal of non-biodegradable silt barriers (such as plastic silt fencing) after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season).
- 2.8 **Heavy Equipment.** No heavy equipment shall operate, or any excavation take place, in the portion of the stream where flowing water is present. 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. If maintenance or refueling of vehicles or equipment must occur on-site, use a designated area and/or a secondary containment, located away from drainage courses to prevent the runoff of storm water and the runoff of spills. Place drip pans or absorbent materials under vehicles and equipment when not in use. Equipment shall be stored in areas that any possible contamination from the equipment would not flow or be washed back into the channel.
- 2.9 **Hazardous Materials.** Debris, soil, silt, sand, rubbish, construction waste, cement or concrete or washings thereof, asphalt, paint, oil or other petroleum products or any other substances which could be hazardous to aquatic life, or other organic or earthen material from any logging, construction, or other associated work related activity shall not be stored where it could be washed back into the channel or where it will cover aquatic or riparian vegetation. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located more than twenty (20) feet from the stream channel and banks. Ensure that all construction areas have proper spill clean-up materials (absorbent pads, sealed containers, booms, etc.) to contain the movement of any spilled substances. All debris shall be disposed of properly. Best Management Practices (BMPs) shall be employed to accomplish these requirements. The Department shall be notified immediately by the Permittee of any spills and shall be consulted regarding clean-up procedures.
- 2.10 **Invasive Species.** Permittee shall conduct project activities in a manner that prevents the introduction, transfer, and spread of aquatic, riparian, and terrestrial invasive species, including plants, animals, and microbes (e.g., algae, fungi, parasites, mussels, and bacteria), from one work site and/or water body to another. Prior to entering the impoundment, Permittee shall inspect equipment to be used in the impoundments for invasive species and, if any signs of invasive species are found, the equipment shall be cleaned to remove those species. All visible soil/mud, plant materials, and animal remnants on equipment will be removed prior to entering and exiting the work site and/or between each use in different water bodies. Permittee shall notify the Department immediately if an invasive species not previously known to occur within the work site is discovered during work activities by contacting the Department's Invasive Species Program by email at [Invasives@wildlife.ca.gov](mailto:Invasives@wildlife.ca.gov).

- 2.11 Removal of Debris, Materials and Rubbish. The Permittee shall remove all project generated debris, building materials and rubbish from the stream and from areas within one hundred and fifty (150) feet of the high water mark, where such materials could be washed into the stream following completion of project activities.
- 2.12 Site Restoration. All exposed/disturbed areas and access points within the stream left barren of vegetation as a result of the construction activities, such as staging areas, shall be restored using locally native grass and/or forb seeds, locally native grass plugs and/or a mix of quick growing sterile non-native grass with locally native grass/forb seeds. Seeded areas shall be covered with broadcast straw and/or seeded erosion control blankets.

### **3. Reporting Measures**

The Permittee shall meet each reporting requirement described below.

- 3.1 The Permittee shall notify the Department within two working days of beginning work within the channel. Notification shall be submitted as instructed in Contact Information section below. Email notification is preferred.
- 3.2 Upon completion of the project activities described in this Agreement, the work area shall be digitally photographed. Photographs and notification of project completion shall be submitted to the Department within 30 days of completion as instructed in Contact Information section below. Email submittal is preferred.

### **CONTACT INFORMATION**

Any communication that the 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 the Permittee or the Department specifies by written notice to the other.

To the Permittee:  
Tom Balestri  
Graeagle Community Services District  
B.O. Box 1414  
Graeagle, CA 96103  
Phone: (925) 895-1199  
Email: [gcsd96103@yahoo.com](mailto:gcsd96103@yahoo.com)

To Contact:  
Daniel B. Bastian  
211 Poplar Valley Road  
Blairsden, CA 96103  
Phone: (530) 836-2644

Email: bastianengineeringninc@gmail.com

**To the Department:**

Department of Fish and Wildlife  
North Central Region  
1701 Nimbus Road  
Rancho Cordova, CA 95670  
Attn: Lake and Streambed Alteration Program  
Notification #1600-2014-0284-R2  
Phone: (916) 358-2900 or 916-358-2885  
Fax: (916) 358-2912  
Email: R2LSA@wildlife.ca.gov

**LIABILITY**

The Permittee shall be solely liable for any violations of the Agreement, whether committed by the Permittee or any person acting on behalf of the 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 the Permittee to proceed with the project. The decision to proceed with the project is the Permittee's alone.

**SUSPENSION AND REVOCATION**

The Department may suspend or revoke in its entirety the Agreement if it determines that the Permittee or any person acting on behalf of the 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 the 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 the Permittee an opportunity to correct any deficiency before the Department suspends or revokes the Agreement, and include instructions to the 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 the 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 the Permittee or any person acting on behalf of the 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 the Permittee or any person acting on behalf of the 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 the Permittee or any person acting on behalf of the 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.

The Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by the Department and the Permittee. To request an amendment, the 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 the 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, the 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), the 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, the 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 the Permittee fails to submit a request to extend the Agreement prior to its expiration, the Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (Fish & G. Code, § 1605, subd. (f)).

#### **EFFECTIVE DATE**

The Agreement becomes effective on the date of the Department's signature, which shall be: 1) after the 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 <https://www.wildlife.ca.gov/Conservation/CEQA/Fees>.

#### **TERM**

This Agreement shall expire three years from the date signed by the Department, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. The 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. Exhibit A. Map of Project Location

#### AUTHORITY

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

#### AUTHORIZATION

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

#### CONCURRENCE

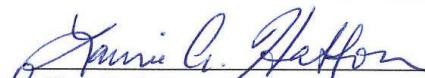
The undersigned accepts and agrees to comply with all provisions contained herein.

**FOR GRAEAGLE COMMUNITY SERVICES  
DISTRICT**

  
Tom Balestri  
Chair

  
Date

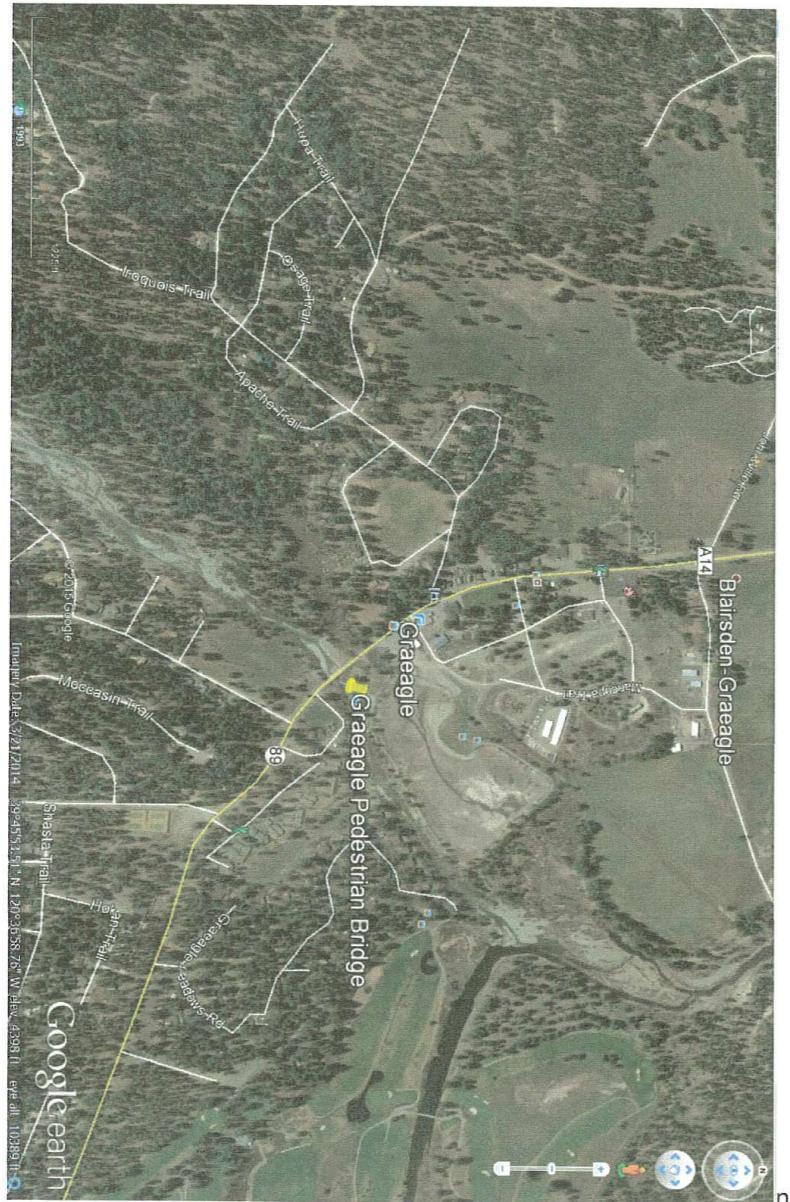
**FOR DEPARTMENT OF FISH AND WILDLIFE**

  
Tina Bartlett  
Regional Manager

  
Date

Prepared by: Tanya Sheya  
Environmental Scientist

Exhibit A. Map of Project



# **APPENDIX E**

Wetland delineation and Jurisdictional Determination. U.S. Army Corps of Engineer's  
Verification and Correspondence



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT  
1325 J STREET  
SACRAMENTO CA 95814-2922

May 31, 2022

Regulatory Division (SPK-2016-00682)

Graeagle Community Services District  
Attn: Mr. Christopher Ruedy  
P.O. Box 1414  
Graeagle, California 96103-1414  
[christopher.ruedy@gmail.com](mailto:christopher.ruedy@gmail.com)

Dear Mr. Ruedy,

We are responding to your February 18, 2022, request for a preliminary jurisdictional determination (JD) for the Graeagle Pedestrian Bridge site. The approximately 0.52-acre project site is located on, Graeagle Creek, Latitude 39.76509°, Longitude -120.61711°, City of Graeagle, Plumas County, California.

Based on available information, we concur with your aquatic resources delineation for the site as depicted on the enclosed March 30, 2022, *Preliminary Plan and Profile for Graeagle Creek Pedestrian Bridge* prepared by Bastian Engineering (enclosure 1). The approximately 0.52 acre of riverine waters present within the survey area are potential jurisdictional aquatic resources ("waters of the United States") regulated under Section 404 of the Clean Water Act. This letter verifies that the location and boundaries of wetlands were delineated consistent with the wetland definition at 33 CFR §328.3(c)(16), the 1987 *Corps of Engineers Wetlands Delineation Manual* (Wetlands Research Program Technical Report Y-87-1) and the applicable regional supplements; the location and boundaries of tidal waters conform with the high tide line defined at 33 CFR §328.3(c)(4); and the location and boundaries of non-tidal waters conform with the ordinary high water mark definition at 33 CFR §328.3(c)(7), Regulatory Guidance Letter 05-05, and any applicable regional guide.

At your request, we have completed a preliminary JD for the site. Enclosed find a copy of the *Preliminary Jurisdictional Determination Form* (enclosure 2). Please sign and return the completed form to the address listed below within 30 days of the date of this letter. If you do not return the signed form within 30 days, we will presume concurrence and finalize the preliminary jurisdictional determination.

We recommend you provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

You may request an approved JD for this site at any time prior to starting work within waters, including after a permit decision is made. To request an approved JD for this site, complete the attached *Request for Aquatic Resources Delineation or Jurisdictional Determination Form* (enclosure 3) and return it to this office at the address listed below. A *Notification of Appeal Process and Request for Appeal Form* is enclosed to notify you of your options with this determination (enclosure 4).

We are also responding to your request to evaluate your project's need for a CWA Section 404 permit. Based on the information you have provided; we have determined that the proposed work will not result in work in navigable waters of the U.S. or the discharge of dredged or fill material into waters of the United States. Therefore, a Department of the Army Permit is not required. Measures should take to prevent construction materials and/or activities from entering any waters of the United States. Appropriate soil erosion and sediment controls should be implemented onsite to achieve this end. This determination was based on the information you submitted, including the March 30, 2022, *Preliminary Plan & Profile for Graeagle Creek Pedestrian Bridge*, prepared by Bastian Engineering figure submitted to this office.  
(Enclosure 1) If proposed project plans would modify the location or extent of work, we recommend you request a new determination from this office.

We appreciate feedback, especially about interactions with our staff and processes.

Please refer to identification number SPK-2016-00682 in any correspondence concerning this project. If you have any questions, please contact Kirsten Grabreck at 1325 J Street, Room 1350, Sacramento, California 95814, by email at [Kirsten.R.Grabreck@usace.army.mil](mailto:Kirsten.R.Grabreck@usace.army.mil) , or telephone at 916-557-5353. For program information or to complete our Customer Survey, visit our website at [www.spk.usace.army.mil/Missions/Regulatory.aspx](http://www.spk.usace.army.mil/Missions/Regulatory.aspx) .

Sincerely,



Lisa Gibson  
Chief, Special Projects Branch  
Regulatory Division

Enclosures

cc: (w/o encls)  
Chuck C. Hughes, Sycamore Environmental Consultants, Inc.,  
[Chuck.Hughes@SycamoreEnv.com](mailto:Chuck.Hughes@SycamoreEnv.com)  
Daniel Bastian, Bastian Engineering Inc., [bastianengineeringinc@gmail.com](mailto:bastianengineeringinc@gmail.com)

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND  
REQUEST FOR APPEAL**

Applicant: Graeagle Community Services District Attn: Mr. Christopher Ruedy	File No.: SPK-2016-00682	Date: May 31, 2022
Attached is:		See Section below
INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
PROFFERED PERMIT (Standard Permit or Letter of permission)		B
PERMIT DENIAL		C
APPROVED JURISDICTIONAL DETERMINATION		D
→ PRELIMINARY JURISDICTIONAL DETERMINATION		E
<p><b>SECTION I -</b> The following identifies your rights and options regarding an administrative appeal of the above decision.            Additional information may be found at <a href="http://www.usace.army.mil/cecw/pages/reg_materials.aspx">http://www.usace.army.mil/cecw/pages/reg_materials.aspx</a> or Corps regulations at 33 CFR Part 331.</p>		
<p><b>A: INITIAL PROFFERED PERMIT:</b> You may accept or object to the permit.</p> <ul style="list-style-type: none"> <li>• ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.</li> <li>• OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.</li> </ul>		
<p><b>B: PROFFERED PERMIT:</b> You may accept or appeal the permit.</p> <ul style="list-style-type: none"> <li>• ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.</li> <li>• APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.</li> </ul>		
<p><b>C: PERMIT DENIAL:</b> You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.</p>		
<p><b>D: APPROVED JURISDICTIONAL DETERMINATION:</b> You may accept or appeal the approved JD or provide new information.</p> <ul style="list-style-type: none"> <li>• ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.</li> <li>• APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.</li> </ul>		
<p><b>E: PRELIMINARY JURISDICTIONAL DETERMINATION:</b> You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.</p>		

**SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT**

**REASONS FOR APPEAL OR OBJECTIONS:** (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

**ADDITIONAL INFORMATION:** The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

**POINT OF CONTACT FOR QUESTIONS OR INFORMATION:**

If you have questions regarding this decision and/or the appeal process you may contact: Kirsten R. Grabreck Regulatory Project Manager U.S. Army Corps of Engineers California North Section 1325 J Street, Room 1350 Sacramento, California 95814 Phone: 916-557-5353, FAX 916-557-7803 Email: Kirsten.R.Grabreck@usace.army.mil	If you only have questions regarding the appeal process you may also contact: Thomas J. Cavanaugh Administrative Appeal Review Officer U.S. Army Corps of Engineers South Pacific Division 1455 Market Street, 2052B San Francisco, California 94103-1399 Phone: 415-503-6574, FAX: 415-503-6646) Email: Thomas.J.Cavanaugh@usace.army.mil
--	--

**RIGHT OF ENTRY:** Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.	Date:	Telephone number:
----------------------------------	-------	-------------------

SPD version revised December 17, 2010

**PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM**

**BACKGROUND INFORMATION**

**A. REPORT COMPLETION DATE FOR PJD:**

**B. NAME AND ADDRESS OF PERSON REQUESTING PJD:**

**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:** Graeagle Pedestrian Bridge,  
SPK-2016-00682

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**

(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES  
AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: California    County: Plumas County    City:

Center coordinates of site (lat/long in degree decimal format):

Lat.: 39.76509 Long.: -120.61711

Universal Transverse Mercator: 704108.88, 4404400.34

Name of nearest waterbody: Greaeagle Creek, Mill Pond, Middle  
Fork Feather River

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

Office (Desk) Determination. Date:

Field Determination. Date(s):

**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO  
REGULATORY JURISDICTION.**

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Graeagle Creek (In PSA)	39.7651	-120.62222	0.52 acre	Riverine	Section 404

- 1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
- 2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "*may be*" waters of the U.S. and/or that there "*may be*" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

- Maps, plans, plots or plat submitted by or on behalf of the PJD requestor: Map:
- Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - Office concurs with data sheets/delineation report.
  - Office does not concur with data sheets/delineation report. Rationale:
- Data sheets prepared by the Corps:
- Corps navigable waters' study:
- U.S. Geological Survey Hydrologic Atlas:
  - USGS NHD data.
  - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: Blairsden.
- Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs:  Aerial (Name & Date):  
Or  Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Other information (please specify):

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

*dw/MG/lon* May 31, 2022

Signature and date of  
Regulatory staff member  
completing PJD

Signature and date of  
person requesting PJD  
(REQUIRED, unless obtaining  
the signature is impracticable)<sup>1</sup>

*Christopher Rudy  
Board member, GCSD  
6/9/2022*

<sup>1</sup> Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

The area of impact shown on the following Jurisdictional Delineation Report was superseded by the previous approvals noted above for the relocation of the bridge further downstream.

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Jurisdictional Delineation Report  
for the  
Graeagle Creek Pedestrian Bridge Project

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Plumas County, CA

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Prepared by:

*Sycamore Environmental Consultants, Inc.*  
6355 Riverside Blvd., Suite C  
Sacramento, CA 95831  
Phone: 916/ 427-0703  
Contact: Chuck Hughes, M.S.

Prepared for:

*Graeagle Community Services District*  
PO Box 1414  
Graeagle, CA 96103  
Phone: 530/ 832-0565  
Contact: Tom Balestri, GCSD Chair

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29 August 2016

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**Jurisdictional Delineation Report  
for the  
Graeagle Creek Pedestrian Bridge Project**

Plumas County, CA

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Appendix C. Plant Species Recorded at Data Points
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## **I. INTRODUCTION**

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### **A. Purpose**

Sycamore Environmental Consultants, Inc., conducted a jurisdictional delineation of the Graeagle Pedestrian Bridge Project biological study area (BSA) in Plumas County, CA. The purpose of the delineation was to identify wetlands and waters in the BSA. Jurisdictional delineations are preliminary until verified by the U.S. Army Corps of Engineers (Corps).

### **B. Project Location**

The 1.11-acre BSA is next to the State Route 89 (SR 89) bridge over Graeagle Creek, in the community of Graeagle, in Plumas County, CA. The BSA is on the Blairsden USGS topographic quad (T22N, R12E, Section 15; Figure 1) and is in the Frazier Creek-Middle Fork Feather River Hydrologic Unit (Hydrologic Unit Code 180201230502). The centroid of the BSA is 39°45'54.26" north, 120°37'01.21" west (WGS84), and the UTM coordinates are 704,118 meters east, 4,404,399 meters north, Zone 10S (WGS84). Photographs of the BSA are in Appendix B. Figure 2 is an aerial photograph of the BSA.

To access the BSA from Redding, take Interstate-5 South for 32 miles. Take exit 649 for Antelope Blvd/ California State Route 36 (SR 36) east and turn left onto Antelope Blvd. In 2.2 miles, turn left onto SR 36 East. Continue for 65.9 miles, then turn right onto SR 89 South, following signs for Greenville/Quincy. Continue on SR 89 for 33.4 miles, where the road ends. Turn left onto California State Route 70 E/SR 89 South. In 33.3 miles, turn right to stay on SR 89 South. Continue for 1.4 miles and arrive at the BSA at Graeagle Creek Crossing.

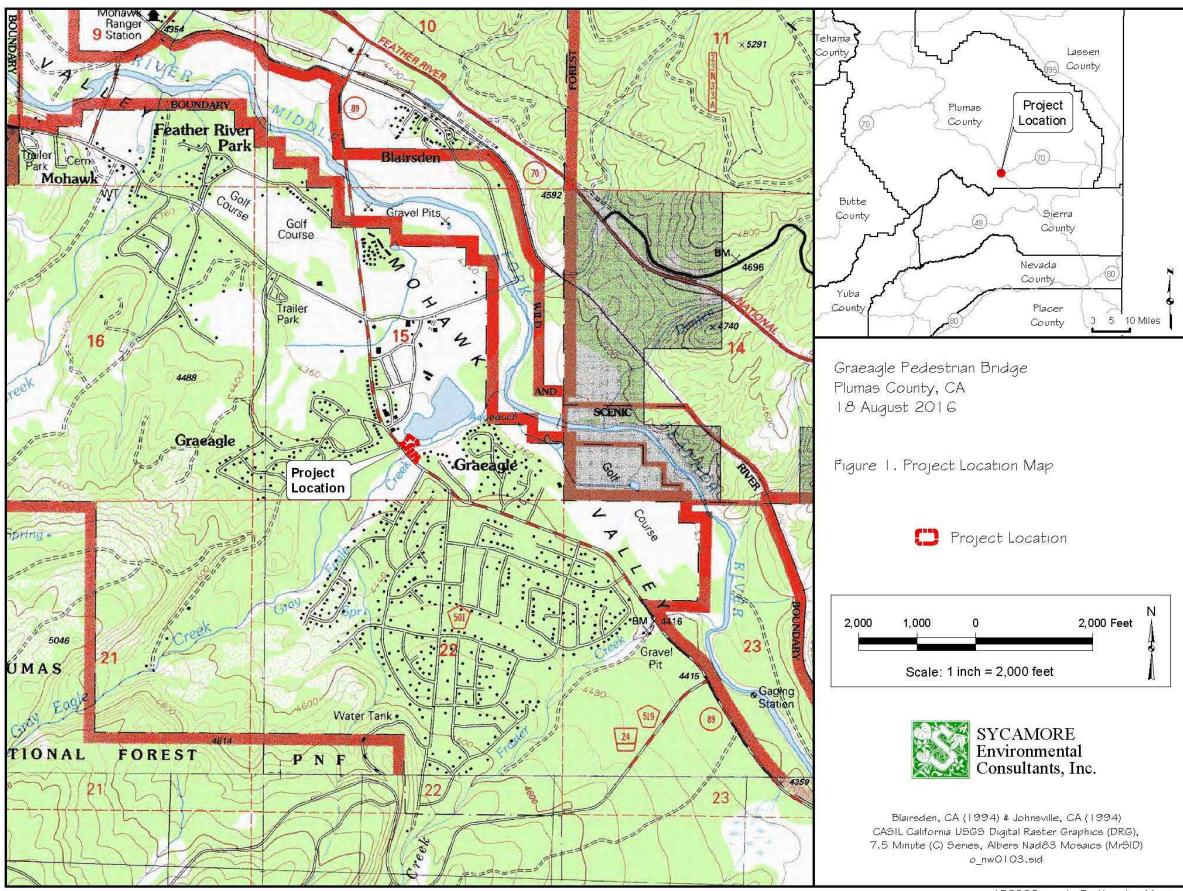
### **C. Engineer and Owner**

Engineer:	Owner:
Bastian Engineering, Inc.	Graeagle Community Services District
211 Poplar Valley Rd.	PO Box 1414
Blairsden, CA 96103	Graeagle, CA 96103
Phone: 530/ 836-2644	Phone: 530/ 832-0565
Contact: Mr. Daniel B. Bastian, Project Engineer	Contact: Tom Balestri, GCSD Chair

### **D. Project Description**

Graeagle Community Services District intends to construct a pedestrian bridge over Graeagle Creek. The proposed bridge will be built approximately 40 ft north (downstream) of the SR 89 vehicle bridge.

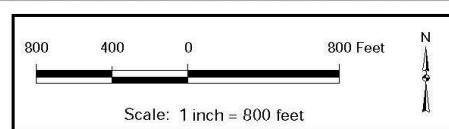
The project will construct two bridge abutments, pedestrian approaches and a single-span bridge. The abutments will be concrete-cantilever footing with concrete wing-walls and rock armoring, and will extend approximately 10-feet below the existing grade. The bridge structure will have a clear span of 150 feet and a deck width of 12 ft 3 inches. The approach pathways will have 10 ft wide paved paths with 1 ft wide gravel shoulders. The abutments and rock armoring have been designed to avoid work in the ordinary high water mark of Graeagle Creek. The premanufactured bridge structure will be placed by crane from SR 89. Temporary traffic control on SR 89 will occur during construction of the pedestrian bridge. The project is locally funded.





Graeagle Pedestrian Bridge  
Plumas County, CA  
19 August 2016

Project Location



Aerial Photograph: 25 July 2014  
NAIP2014 USDA FSA Imagery  
ESRI Arcmap Basemap Layer  
Hydrography: USGS NHD Hydrography Flowlines

Figure 2. Aerial Photograph

15030Graeagle\_Fig2AerialPhoto.mxd

## **II. STUDY METHODS**

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### **A. Data Sources**

Table 1 is a list of data sources used for report preparation and itemized by the Corps and EPA as supporting data for jurisdictional determinations (Corps and EPA 2007).

Table 1. Data Sources

Data Requested	Source
Maps, plans, plots or plat submitted by or on behalf of the applicant	Figures 1-4
Data sheets prepared/submitted by or on behalf of the applicant	See datasheets in Appendix A
Corps navigable waters study	Corps (2016b)
U.S. Geological Survey Hydrologic Atlas. 1. USGS NHD data 2. USGS 8 and 12 digit HUC maps	Middle Fork Feather River (18020123) Frazier Creek (180201230502)
U.S. Geological Survey map(s)	Blairsden USGS quad (See Figure 1)
USDA Natural Resources Conservation Service Soil Survey	NRCS (1993; 2016a; 2016b); see Figure 3
National Wetlands Inventory map(s)	NWI map for the Blairsden USGS quad (USFWS 2016)
State/Local wetland inventory map(s)	None known
FEMA/FIRM maps	See Appendix D; effective 2 March 2005
100-year Floodplain Elevation is: (e.g., North American Vertical Datum of 1988).	Zone A: No base flood elevations determined. Zone X: Area of minimal flood hazard.
Photographs: 1. Aerial (Name & Date) 2. Other (Name & Date)	Figure 2, Aerial Photograph, 25 July 2014 Appendix B, Photographs of BSA, 30 May 2016
Previous determination(s). File no. and date of response letter	None known

### **B. Survey Dates and Personnel**

Fieldwork for the jurisdictional delineation was conducted by Chuck Hughes, M.S. on 30 May 2016.

### **C. Survey Methods**

This jurisdictional delineation report has been prepared in accordance with the Sacramento District minimum standards (Corps 2016a), U.S. Army Corps of Engineers Wetland Delineation Manual (Corps 1987), Regulatory Guidance Letter 05-05 (Corps 2005), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Corps 2010). Regional supplements are intended to bring the Corps Manual (Corps 1987) up to date with current knowledge and practice in specific regions. The Western Mountains, Valleys, and Coast Region Supplement is applicable to the BSA because it is located in sub region Sierra Nevada Mountains MLRA 22A (Corps 2010). All wetland and water features were identified and mapped. Hydrophytic classifications of plants were determined from National Wetland Plant List (Lichvar et al. 2016). Plant nomenclature follows Baldwin et al., ed. (2012).

#### **D. Jurisdictional Data**

The jurisdictional delineation was conducted using the Routine On-Site Determination Method (Corps 1987). Jurisdictional data were recorded using the Wetland Determination Data Form for the Western Mountains, Valleys, and Coast Region (Corps 2010). Soil, vegetation, and hydrology data were recorded at the data points. Wetland data sheets are in Appendix A. Photographs are in Appendix B. Appendix C is a list of plant species recorded at the data points.

#### **E. Mapping and Calculation of Acresages**

Features observed in the BSA were mapped using a Trimble Geo-XT sub-meter accurate global positioning system (GPS). The GPS data were exported to ArcMap and Google Earth, where feature boundaries were completed based on field notes wherever a signal could not be received. Acresages were calculated using ESRI ArcMap functions.

#### **F. Definitions**

The Corps and EPA regulate the discharge of dredge and fill material into “waters of the United States” under Section 404 of the Clean Water Act (CWA; 33 U.S.C. 1344). The lateral limits of jurisdiction in waters of the U.S. may be divided into three categories. The categories are the territorial seas, tidal waters, and non-tidal waters [see 33 CFR 328.4 (a), (b), and (c), respectively]. The current regulations defining waters of the U.S. [33 CFR 328.3(a)] and defining features that are excluded [33 CFR 328.3(b)], became effective on 28 August 2015 (80 FR 37054), but was stayed by the U.S Sixth Circuit Court of Appeals on 9 October 2015. The definition of waters of the U.S. below, from prior to 28 August 2015, is the definition currently implemented by the Corps while the stay from the Circuit Court is in effect.

The term “waters of the U.S.” is defined at 33 CFR 328.3(a) as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
  - i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
  - ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  - iii. Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under the definition;
5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
6. The territorial seas;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1)-(6) of this section.
8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area’s status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

The term “adjacent” is defined at 33 CFR 328.3(c):

The term *adjacent* means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are “adjacent wetlands.”

The limits of jurisdiction are identified in 33 CFR 328.4 as:

- a. Territorial Seas. The limit of jurisdiction in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles. (See 33 CFR 329.12)
- b. Tidal Waters of the United States. The landward limits of jurisdiction in tidal waters:
  1. Extends to the high tide line, or
  2. When adjacent non-tidal waters of the United States are present, the jurisdiction extends to the limits identified in paragraph (c) of this section.
- c. Non-Tidal Waters of the United States. The limits of jurisdiction in non-tidal waters:
  1. In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or
  2. When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands.
  3. When the water of the United States consists only of wetlands the jurisdiction extends to the limit of the wetland.

The term “ordinary high water mark” is defined at 33 CFR 328.3(e):

The term *ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Wetlands, as defined by the Corps for regulatory purposes, are identified using a three-parameter test that considers whether hydrophytic vegetation, hydric soils, and hydrology are present (Corps 1987). Wetlands are “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3, 40 CFR 230.3). Wetlands also include less conspicuous wetland types such as vernal pools and other seasonal wetlands.

An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow. An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow (66 FR 42099).

### **III. SETTING**

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The Biological Study Area (BSA) is in the Sierra Nevada Mountains, in the community of Graeagle, in an unincorporated area of Mohawk Valley in Plumas County. The area is characterized by coniferous forest and a small amount of urban development.

#### **A. Topography**

Elevation in the BSA ranges from approximately 4,381 to 4,397 feet above sea level. The confluence of Graeagle Creek with Middle Fork Feather River is approximately 0.36 mi northeast of the BSA. The entire BSA drains to the Middle Fork Feather River.

#### **B. Existing Field Conditions**

Field work for the jurisdictional delineation was conducted on 30 May 2016. The Portola (PRT) station is located approximately 8.3 miles northeast of the BSA. The historic average accumulated precipitation for the Portola station from 1 June through 30 May is 20.6 inches. From 1 June 2015 through 30 May 2016, the Portola station received 28.8 inches of rain, or approximately 140% of normal (CDWR 2016). Accumulated precipitation data indicate that hydrologic conditions in the BSA were wetter than average on 30 May 2016. About 0.46 inch of precipitation was recorded in the week preceding the 30 May 2016 fieldwork.

#### **C. Vegetation**

There is a riparian corridor along the margin of Graeagle Creek dominated by willow (*Salix* spp.), white alder (*Alnus rhombifolia*), and western choke cherry (*Prunus virginiana* var. *demissa*). Some of the riparian vegetation is rooted below the ordinary high water mark of Graeagle Creek. Uplands farther from the creek are mostly comprised of native and nonnative grasses and forbs with some scattered trees.

#### **D. Existing Level of Disturbance**

The staging area is a gravel parking lot in the north end of the BSA. The parking lot occupies much of the BSA. The BSA is bordered by two gravel driveways on the northwest and southeast ends.

#### **E. Soils**

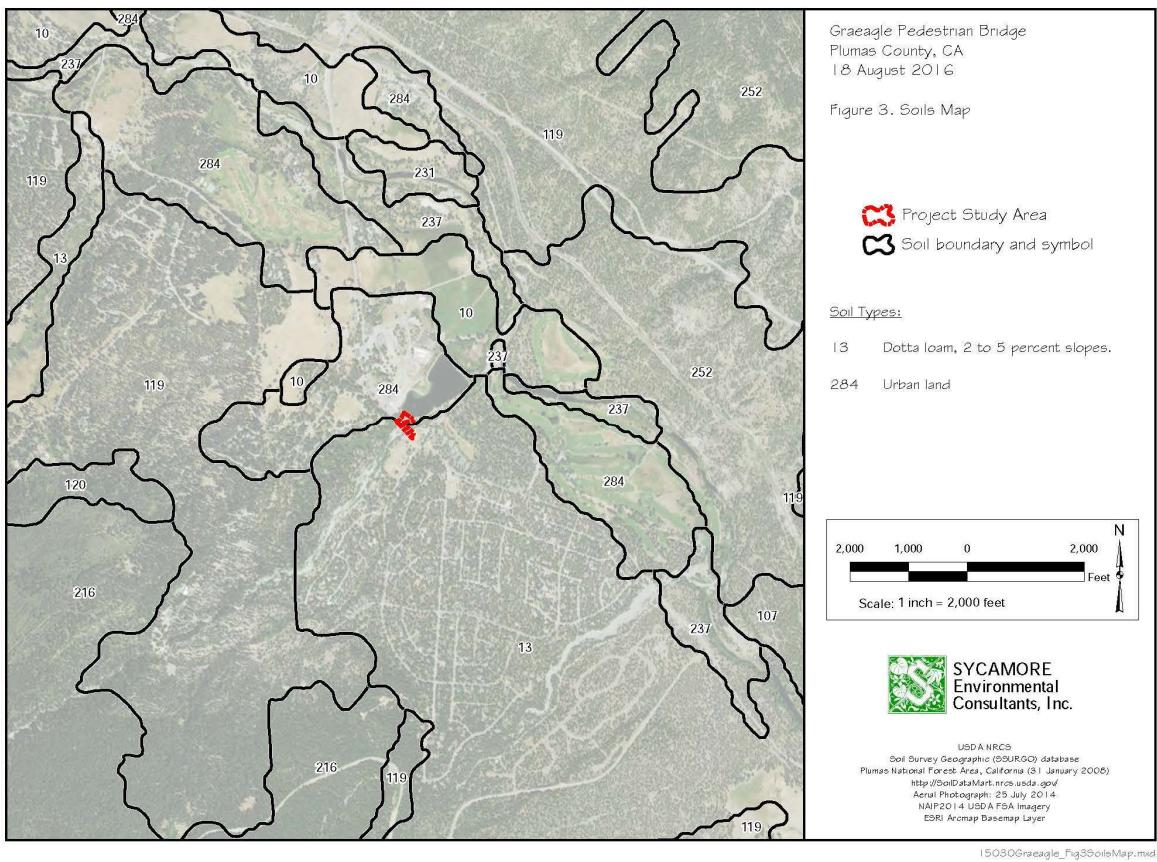
Soils in the BSA are mapped as Dotta loam, 2 to 5 percent slopes, and urban land (NRCS 2016b). The following descriptions are summarized from NRCS (2016a). Reported colors are for moist soils. Figure 3 is a soils map.

**Dotta loam, 2 to 5 percent slopes:** The Dotta series consists of very deep, well-drained soils that form in alluvium weathered from metamorphic and igneous rock. They occur on alluvial fans and terraces. A typical profile of Dotta has very dark brown (10YR 2/2), sandy loam from 0 to 13 inches; very dark, grayish brown (10YR 3/2), heavy loam from 13 to 21 inches; dark brown (10YR 3/3), sandy clay loam from 21 to 30 inches; very dark, grayish brown (2.5Y 3/2), heavy sandy clay loam from 30 to 41 inches; brown (10YR 4/3), sandy loam from 41 to 59 inches; and dark brown (10YR 3/3), coarse sandy loam from 59 to 68 inches. Runoff is slow and the hazard of erosion is slight (NRCS 1993).

**Urban Land:** Urban land is mostly covered by streets, parking lots, buildings and other structures of urban areas. Urban land has essentially no soil and supports little or no vegetation (NRCS 1993).

#### **F. National Wetlands Inventory Map**

Graeagle Creek is the only feature from the NWI map in the BSA (USFWS 2016). Graeagle Creek is identified as riverine, upper perennial, unconsolidated bottom, and permanently flooded (R3UBH).



## IV. WETLANDS AND WATERS

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On 2 December 2008, the Corps and EPA issued a memorandum providing guidance on implementation of the Supreme Court's decision in the consolidated cases of *Rapanos v. United States* and *Carabell v. United States* (Corps and EPA 2008). An evaluation of features relative to their potential jurisdiction under Section 404 of the Clean Water Act (33 U.S.C. 1344) in light of the December 2008 Rapanos guidance is in Section V. Figure 4 is a Jurisdictional Delineation Map.

### A. Waters

**Graeagle Creek:** Graeagle Creek is mapped as a perennial stream on the USGS Blairsden quad map and on the NWI map. Graeagle Creek has an average width of 93.3 ft in the BSA. Approximately 0.15 acre and 70 ft of Graeagle Creek occur in the BSA. Graeagle Creek flows approximately northeast through the BSA.

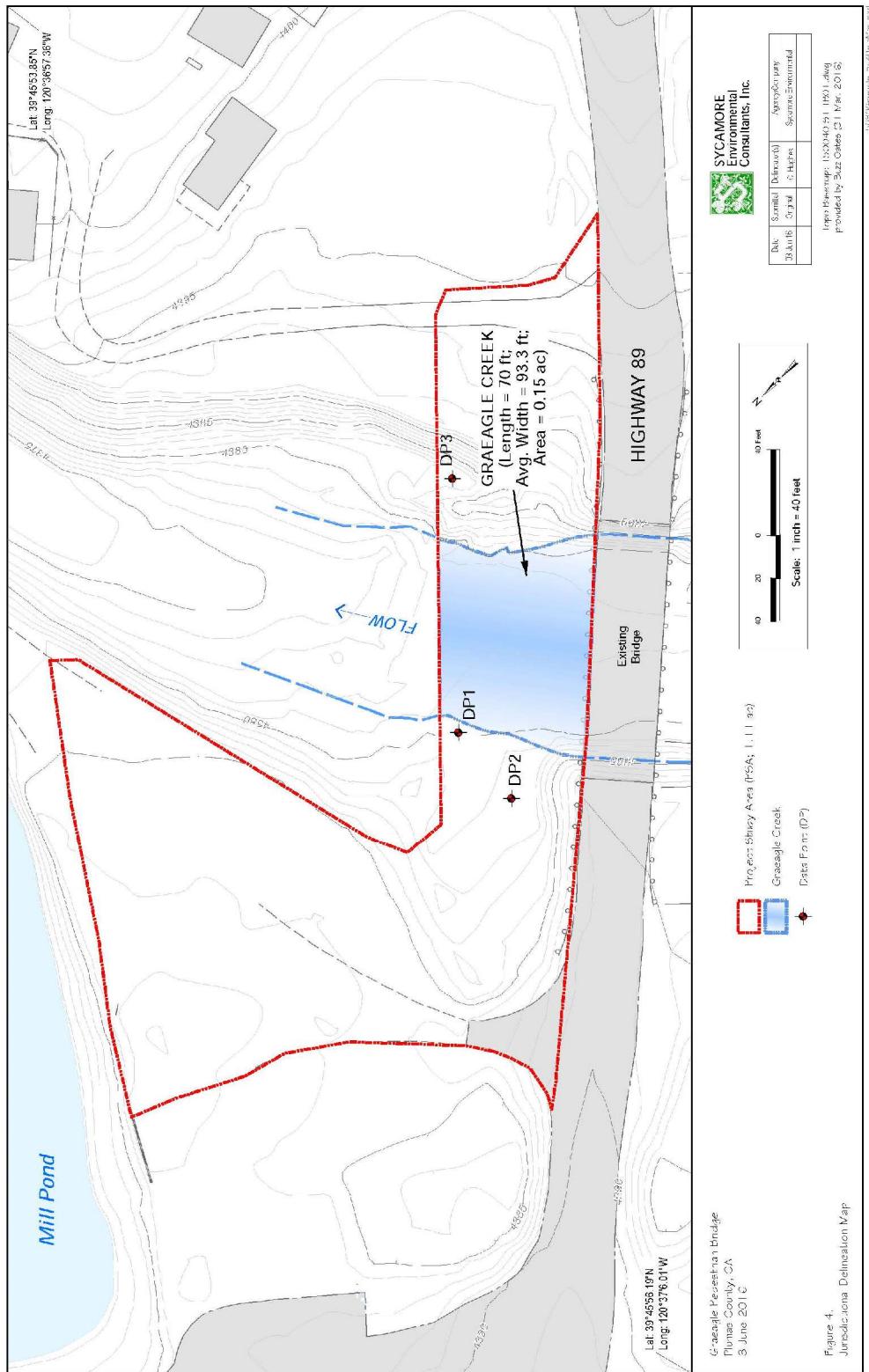
The bed of Graeagle Creek consists mostly of cobble. The OHWM determination for Graeagle Creek in the BSA was based primarily on wracking and scour (Corps 2005).

Table 2. Summary of Waters and Wetlands

Feature	Hydrology/ Cowardin Classification	Length (ft)	Avg. Width (ft)	Area (ac)
Graeagle Creek	Perennial/ R3UBH	70	93.3	0.15
<b>Total Waters:</b>		<b>70</b>	<b>93.3</b>	<b>0.15</b>

### B. Wetlands

Three data points were taken outside the OHWM of the creek. There were no wetlands in the BSA.



## V. REGULATORY ANALYSIS AND DISCUSSION

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On 2 December 2008, the Corps and EPA issued a memorandum providing guidance on implementation of the Supreme Court's decision in the consolidated cases of *Rapanos v. United States* and *Carabell v. United States* (2008). These two cases address the scope of the Corps' jurisdiction over waters of the United States under the Clean Water Act. The guidance distinguishes among traditional navigable waters (TNW), relatively permanent waters (RPW), and non-relatively permanent waters (non-RPW). The Corps will routinely exercise jurisdiction over TNWs, RPWs, wetlands abutting these waters, and wetlands adjacent to TNWs. The jurisdictional determination for non-relatively permanent waters, their adjacent wetlands (if any), and wetlands adjacent to RPWs not considered traditionally navigable will be based on whether there exists a significant nexus with a TNW. Factors evaluated by the Corps during the significant nexus evaluation will include ecology, hydrology, and the influence of the water on the "chemical, physical, and biological integrity of downstream traditional navigable waters" (Corps 2008). The Corps may exert jurisdiction if the findings of the significant nexus evaluation indicate that "the tributary and its adjacent wetlands are likely to have an effect [on downstream traditional navigable waters] that is more than speculative or insubstantial" (Corps and EPA 2008). Finally, the guidance provides that the Corps will not generally assert jurisdiction over ditches (including roadside ditches) which are excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water. The guidance recognizes that these features, by their very nature, do not have a significant nexus to downstream traditional navigable waters.

The Rapanos memorandum (Corps and EPA 2008) does not affect the Court's decision in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, No. 99-1178 (January, 2001; "SWANCC") which involved statutory and constitutional challenges to the assertion of CWA jurisdiction over isolated, non-navigable, intrastate waters used as habitat by migratory birds. Isolated wetlands and waters are not subject to Clean Water Act jurisdiction.

The following is an assessment of Corps jurisdiction over the features identified within the BSA in Section IV, pursuant to the Corps/EPA guidance memorandum:

### A. TNWs and Adjacent Wetlands

No TNWs or wetlands adjacent to TNWs occur in the BSA. The nearest downstream TNW is the Feather River, which is navigable from its mouth to Marysville (Corps 2016b).

### B. RPWs that flow directly or indirectly into TNWs

Graeagle Creek is an RPW that flows indirectly into a TNW outside of the BSA. Graeagle Creek is tributary to the Middle Fork Feather River, which is tributary to the Feather River, a TNW.

### C. Non-RPWs that flow directly or indirectly into TNWs

No non-RPWs occur in the BSA.

### D. Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

No wetlands directly abutting RPWs occur in the BSA.

**E. Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs**

No wetlands adjacent to but not directly abutting RPWs occur in the BSA.

**F. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs**

No wetlands adjacent to non-RPWs occur in the BSA.

**G. Impoundments of waters**

There are no impoundments of water in the BSA.

**H. Isolated (interstate or intrastate) waters, including isolated wetlands**

No isolated waters, including isolated wetlands, occur in the BSA.

**I. Non-jurisdictional features**

There are no non-jurisdictional features in the BSA.

**J. Summary of Jurisdictional Acreages**

A total of 0.15 acre of jurisdictional waters occurs in the BSA.

## **VI. LITERATURE CITED**

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## **VII. REPORT PREPARERS**

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**Chuck Hughes, M.S.**, Plant Biology, Michigan State University, East Lansing, MI. Over 15 years of experience preparing biological/botanical resource evaluations, wetland delineations, arborist reports, impact analyses, and mitigation and restoration plans. He is a Professional Wetland Scientist (#2029), an ISA Certified Arborist (WE-6885A), holds a California Department of Fish and Wildlife Rare, Threatened and Endangered Plant Voucher Collecting Permit (2081(a)-14-072-V), is a Principal Scientific Investigator on the CDFW Scientific Collecting Permit (SC-7617), and is authorized individual on a USFWS recovery permit for listed vernal pool branchiopods (TE799564-4). His bachelor's degree from UC Davis is in environmental horticulture and urban forestry, with an emphasis in plant biodiversity.

Responsibilities: Fieldwork and report preparation.

**Nicole Desideri, B.S.**, Biological Sciences (concentration in Field and Wildlife Biology), California Polytechnic State University, San Luis Obispo, CA. Ms. Desideri conducts preconstruction and construction monitoring, assists with plant and wildlife surveys, and assists with preparation of biological resource evaluations, Natural Environment Study reports, wetland delineations, permit applications, and other documents used in the CEQA/NEPA process. Serving as both field biologist and technical report writer, she conducts database research on special status species' biology, habitat and distribution. She is an authorized individual on the CDFW Scientific Collecting Permit (SC-7617).

Responsibilities: Report preparation

**Aramis Respall, GIS Analyst/ CAD Operator.** Over 20 years experience in drafting and spatial analysis using AutoCAD map and ArcGIS for public and private projects. He prepares figures for biological and permitting documents such as project location maps, aerial photograph exhibits, biological resource maps, CNDDB proximity maps, wetlands/waters delineation maps, impact analysis maps, tree location maps and other supporting graphics. Mr. Respall provides geospatial analysis and support for projects involving geodesy, hydrology, watershed studies, project impact analysis, CNDDB species, and critical habitat and mitigation information. Primary experience evolved from conventional surveying and civil engineering practices to advanced GPS and GIS based technology.

Responsibilities: Figure preparation and spatial analysis

**Jeffery Little**, Vice President, Sycamore Environmental.

Responsibilities: Principal in charge.

## Appendix A.

### Wetland Data Sheets

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**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: Graeagle Pedestrian Bridge City/County: Plumas Co. Sampling Date: 30-May-16  
 Applicant/Owner: Graeagle CSD State: CA Sampling Point: 1  
 Investigator(s): LCTH Section, Township, Range: See Report  
 Landform (hillslope, terrace, etc): Terrace Local relief (concave, convex, none): Concave-convex Slope (%): 1  
 Subregion (LRR): MLRA 22A Lat: See Report Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: Dotta loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes _____ No <input checked="" type="checkbox"/>	Remarks:	
Wetland Hydrology Present?	Yes _____ No <input checked="" type="checkbox"/>		

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>6' red.</u> )		Absolute % Cover	Dominant Indicator Species?	Status	Dominance Test worksheet:
1. <u>Alnus rhombifolia</u>		<u>50</u>	<u>0</u>	<u>FACW</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____		_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____		_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____		_____	_____	_____	Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: <u>6' red.</u> )		<u>50</u>	<u>= Total Cover</u>		Total % Cover of: _____ Multiply by: _____
1. <u>Salix lasiolepis</u>		<u>5</u>	<u>0</u>	<u>FACW</u>	OBL species _____ x 1 = _____
2. _____		_____	_____	_____	FACW species _____ x 2 = _____
3. _____		_____	_____	_____	FAC species _____ x 3 = _____
4. _____		_____	_____	_____	FACU species _____ x 4 = _____
5. _____		_____	_____	_____	UPL species _____ x 5 = _____
Herb Stratum (Plot size: <u>6' red.</u> )		<u>5</u>	<u>= Total Cover</u>		Column Totals: (A) _____ (B) _____
1. <u>Equisetum arvense</u>		<u>60</u>	<u>0</u>	<u>FAC</u>	Prevalence Index = B/A = _____
2. <u>Tragopogon pratensis</u>		<u>1</u>		<u>VPL</u>	Hydrophytic Vegetation Indicators:
3. <u>Elymus glaucus</u>		<u>10</u>		<u>FACU</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
4. <u>Galium aparine</u>		<u>1</u>		<u>FACU</u>	<input checked="" type="checkbox"/> Prevalence Index is ≥3.0 <sup>1</sup>
5. _____		_____	_____	_____	<input checked="" type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
6. _____		_____	_____	_____	<input checked="" type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup>
7. _____		_____	_____	_____	<input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
8. _____		_____	_____	_____	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
9. _____		_____	_____	_____	
10. _____		_____	_____	_____	
11. _____		_____	_____	_____	
Woody Vine Stratum (Plot size: _____)		<u>72</u>	<u>= Total Cover</u>		Hydrophytic Vegetation Present?
1. _____		_____	_____	Yes <input checked="" type="checkbox"/> No _____	
2. _____		_____	_____		
% Bare Ground in Herb Stratum <u>30</u>		<u>--</u>	<u>= Total Cover</u>		
Remarks:					



**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: Graegle Pedestrian Bridge City/County: Plumas Co. Sampling Date: 30-May-16  
 Applicant/Owner: Graegle CSD State: CA Sampling Point: 2  
 Investigator(s): CHH Section, Township, Range: See Report  
 Landform (hillslope, terrace, etc): Terrace Local relief (concave, convex, none): Concave-concave Slope (%): 1  
 Subregion (LRR): MLRA 22A Lat: See Report Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: Dotta loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes _____	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes _____	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes _____	No <input checked="" type="checkbox"/>			
Remarks:					

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC:	1 (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata:	5 (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	20% (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:	
Sapling/Shrub Stratum (Plot size: <u>6' rad.</u> )	--	= Total Cover		Total % Cover of: _____	Multiply by: _____
1. <u>Salix melanopsis</u>	<u>5</u>	<u>0</u>	<u>OBL</u>	OBL species _____	× 1 = _____
2. <u>Arctostaphylos sp.</u>	<u>2</u>	<u>0</u>	<u>VPL</u>	FACW species _____	× 2 = _____
3. _____	_____	_____	_____	FAC species _____	× 3 = _____
4. _____	_____	_____	_____	FACU species _____	× 4 = _____
5. _____	_____	_____	_____	UPL species _____	× 5 = _____
Herb Stratum (Plot size: <u>6' rad.</u> )	<u>7</u>	= Total Cover		Column Totals: _____ (A)	(B)
1. <u>Bromus tectorum</u>	<u>30</u>	<u>0</u>	<u>VPL</u>	Prevalence Index = B/A = _____	
2. <u>Festuca myuros</u>	<u>25</u>	<u>0</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators:	
3. <u>Acmispon americanus</u>	<u>25</u>	<u>0</u>	<u>FACU</u>	— Dominance Test is >50%	
4. <u>Poa bulbosa</u>	<u>10</u>	<u>0</u>	<u>FACU</u>	— Prevalence Index is ≤3.0 <sup>1</sup>	
5. <u>Festuca arundinacea</u>	<u>3</u>	<u>0</u>	<u>FAC</u>	— Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
6. <u>Tragopogon pratensis</u>	<u>2</u>	<u>0</u>	<u>UPL</u>	— Wellland Non-Vascular Plants <sup>1</sup>	
7. <u>Poa pratensis</u>	<u>3</u>	<u>0</u>	<u>FAC</u>	— Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
8. <u>Erodium cicutarium</u>	<u>2</u>	<u>0</u>	<u>VPL</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
9. _____	_____	_____	_____	Hydrophytic Vegetation Present?	
10. _____	_____	_____	_____	Yes _____	No <input checked="" type="checkbox"/>
11. _____	_____	_____	_____	Remarks:	
Woody Vine Stratum (Plot size: _____)	<u>100</u>	= Total Cover			
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
% Bare Ground in Herb Stratum <u>30</u>	--	= Total Cover			

SOIL

Sampling Point 2

HYDROLOGY

<b>Wetland Hydrology Indicators:</b>	
<b>Primary Indicators (minimum of one required; check all that apply)</b>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<b>Field Observations:</b>	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	
<b>Secondary Indicators (2 or more required)</b>	
<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Frost-Heave Hummocks (D7)	
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: Graegle Pedestrian Bridge City/County: Mumas Co. Sampling Date: 30-May-16  
 Applicant/Owner: Graegle CEO State: IA Sampling Point: 3  
 Investigator(s): CGH Section, Township, Range: See Report  
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave - convex Slope (%): 1  
 Subregion (LRR): MLRA 22A Lat: See Report Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: Dotta loam NWI classification: None  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?
Hydric Soil Present?	Yes _____	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes _____	No <input checked="" type="checkbox"/>	
Remarks:			

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>6' rad.</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Prunus virginiana var. demissa</u>	<u>10</u>	<u>D</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
				Total % Cover of: _____ Multiply by: _____
				OBL species _____ x 1 = _____
				FACW species _____ x 2 = _____
				FAC species _____ x 3 = _____
				FACU species _____ x 4 = _____
				UPL species _____ x 5 = _____
				Column Totals: (A) _____ (B) _____
				Prevalence Index = B/A = _____
				Hydrophytic Vegetation Indicators:
				— Dominance Test is >50%
				— Prevalence Index is ≥3.0 <sup>1</sup>
				— Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
				— Wetland Non-Vascular Plants <sup>1</sup>
				— Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>
				Remarks:

SOIL

### **Sampling Point**

HYDROLOGY

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
Secondary Indicators (2 or more required)	
<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<b>Field Observations:</b>	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

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## Appendix B

Photographs  
30 May 2016



Photo 1. Looking approximately north on the north side of the creek. The shovel is at DP 1.



Photo 2. Looking approximately south on the north side of the creek. This is the reverse direction as the previous photo. The shovel is at DP 1. The creek is in the trees in the background.



Photo 3. Looking approximately north on the south side of the creek.



Photo 4. Looking downstream at the center of Graeagle Creek. Taken from the existing bridge.



Photo 5. View of wracking along the OHWM on the north side of Graeagle Creek.

## Appendix C.

### Plant Species Recorded at Data Points

Family <sup>1</sup>	Scientific Name	Common Name	Stratum	Indicator <sup>2</sup>
<b>FERNS &amp; ALLIES</b>				
Equisetaceae	<i>Equisetum arvense</i>	Common horsetail	Herb	FAC
<b>EUDICOTS</b>				
Asteraceae	<i>Tragopogon pratensis</i>	Meadow salsify	Herb	UPL
Berberidaceae	<i>Berberis aquifolium</i>	Oregon-grape	Shrub	UPL
Betulaceae	<i>Alnus rhombifolia</i>	White alder	Tree	FACW
Caprifoliaceae	<i>Symporicarpos albus</i>	Snowberry	Herb	FACU
Ericaceae	<i>Arctostaphylos</i> sp.	Manzanita	Shrub	UPL
Fabaceae	<i>Acmonia americanus</i>	Deervetch, deerweed	Herb	FACU
Geraniaceae	<i>Erodium cicutarium</i>	Redstem filaree	Herb	UPL
Onagraceae	<i>Epilobium brachycarpum</i>	Willowherb	Herb	UPL
Rubiaceae	<i>Gallium aparine</i>	Goose grass	Herb	FACU
Rosaceae	<i>Prunus virginiana</i> var. <i>demissa</i>	Western choke cherry	Tree	FACU
	<i>Rubus parviflorus</i>	Thimbleberry	Herb	FACU
Salicaceae	<i>Salix lasiolepis</i>	Arroyo willow	Shrub	FACW
	<i>Salix melanopsis</i>	Dusky willow	Shrub	OBL
<b>MONOCOTS</b>				
Poaceae	<i>Bromus tectorum</i>	Cheat grass	Herb	UPL
	<i>Elymus glaucus</i>	Blue wild rye	Herb	FACU
	<i>Festuca arundinacea</i>	Tall fescue	Herb	FAC
	<i>Festuca myuros</i>	Rattail sixweeks grass	Herb	FACU
	<i>Poa bulbosa</i>	Blue grass	Herb	FACU
	<i>Poa pratensis</i>	Kentucky blue grass	Herb	FAC

<sup>1</sup> Taxonomy and nomenclature follow Baldwin et al., eds. (2012).

<sup>2</sup> Indicator status from Lichvar et al. (2016).

## Appendix D.

### FEMA/FIRM Map

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**DEPARTMENT OF THE ARMY**  
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT  
1325 J STREET  
SACRAMENTO CA 95814-2922

October 25, 2016

Regulatory Division (SPK-2016-00682)

Mr. Tom Balestri  
Graeagle Community Services District  
P.O. Box 1414  
Graeagle, California 96103

Dear Mr. Balestri:

We are responding to your September 2, 2016, request for a preliminary jurisdictional determination (JD), in accordance with our Regulatory Guidance Letter (RGL) 08-02, for the Graeagle Pedestrian Bridge site. The approximately 1.11-acre project site is located on Graeagle Creek, Latitude 39.7650861389878°, Longitude -120.617110066141°, Graeagle, Plumas County, California.

Based on available information, we concur with the amount and location of other water bodies on the site as depicted on the enclosed September 1, 2016, *Figure 4. Jurisdictional Delineation Map* drawing prepared by Sycamore Environmental. The approximately 0.15 acre of other water bodies present within the survey area are potential waters of the United States regulated under Section 404 of the Clean Water Act (CWA).

We have enclosed a copy of the *Preliminary Jurisdictional Determination Form* for this site. Please sign and return a copy of the completed form to this office. Once we receive a copy of the form with your signature we can accept and process a Pre-Construction Notification or permit application for your proposed project.

You should not start any work in potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization for the activity. You may request an approved JD for this site at any time prior to starting work within waters. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the particular site identified in this request. A Notification of Appeal Process and Request for Appeal form is enclosed to notify you of your options with this determination. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We are also responding to your request to evaluate your project's need for a CWA Section 404 permit. Based on the information you have provided, we have determined that the proposed work will not result in the discharge of dredged or fill material within waters of the United States. Therefore, a Department of the Army Permit is not required for this work. Measures should be taken to prevent construction materials and/or activities from entering any waters of the United States. Appropriate soil erosion and sediment controls should be implemented onsite to achieve this end.

Our disclaimer of jurisdiction is only for this activity as it pertains to Section 404 of the Federal Clean Water Act and does not refer to, nor affect jurisdiction over any waters present on site. Other Federal, State, and local laws may apply to your activities. Therefore, in addition to contacting other Federal and local agencies, you should also contact state regulatory authorities to determine whether your activities may require other authorizations or permits. In particular, your proposed activity may still be regulated by the State of California's Regional Water Quality Control Boards.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2016-00682 in any correspondence concerning this project. If you have any questions, please contact Matthew Kelley at Redding Regulatory Office, 310 Hemsted Drive, Suite 310, Redding, California 96002, by email at [Matthew.P.Kelley@usace.army.mil](mailto:Matthew.P.Kelley@usace.army.mil), or telephone at 530-223-9534. For more information regarding our program, please visit our website at [www.spk.usace.army.mil/Missions/Regulatory.aspx](http://www.spk.usace.army.mil/Missions/Regulatory.aspx).

Sincerely,

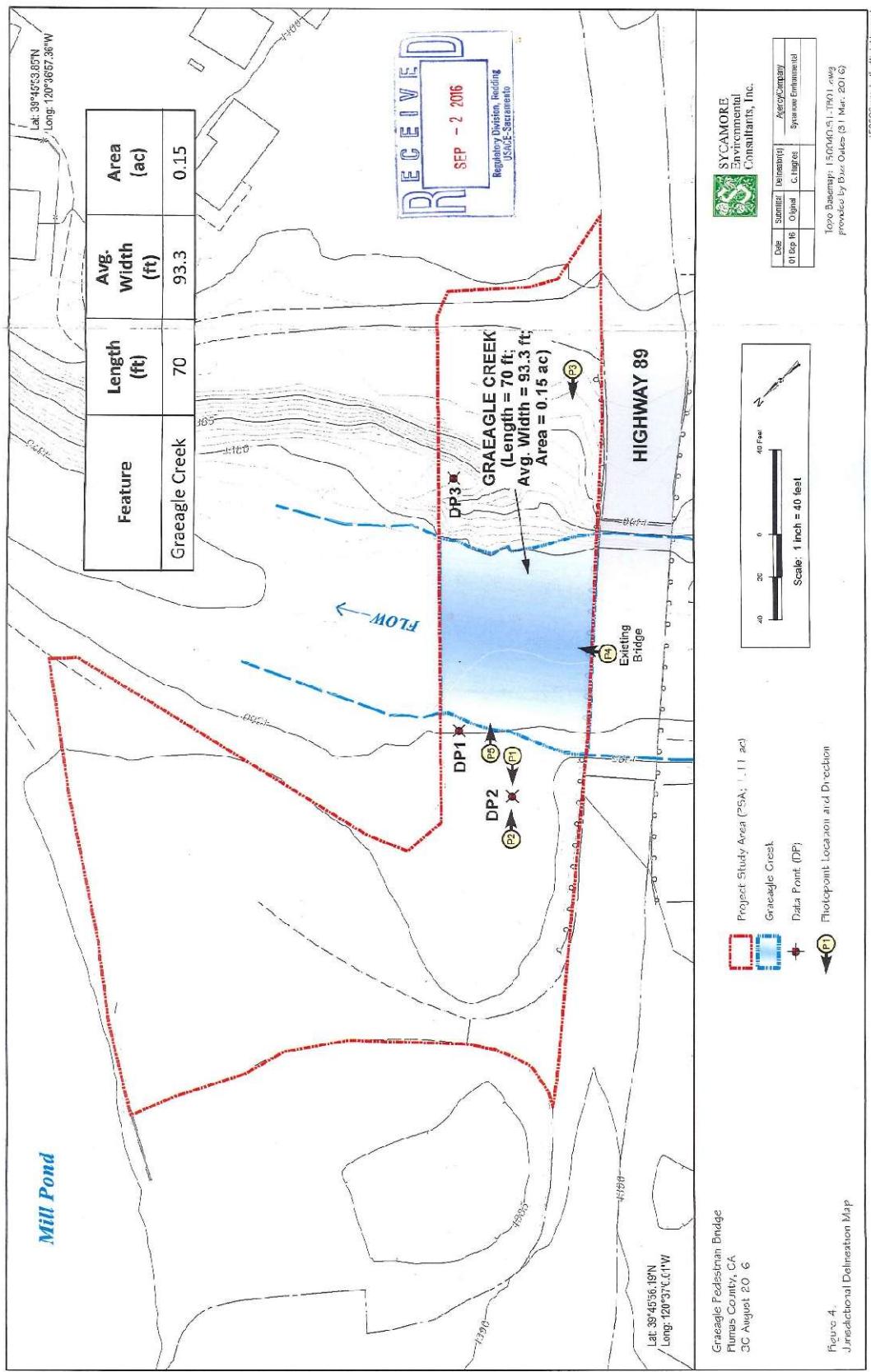


Matthew Kelley  
Chief, Redding Regulatory Office

Enclosures

cc: (w/o encls)

Mr. Joseph Morgan, U.S. Environmental Protection Agency, [Morgan.Joseph@epa.gov](mailto:Morgan.Joseph@epa.gov)  
Mr. Scott Zaitz, Regional Water Quality Control Board, [Scott.Zaitz@waterboards.ca.gov](mailto:Scott.Zaitz@waterboards.ca.gov)  
Mr. Charles Hughes, Sycamore Environmental, [Charles.Hughes@SycamoreEnv.com](mailto:Charles.Hughes@SycamoreEnv.com)





Daniel Bastian <bastianengineeringinc@gmail.com>

## Graeagle Creek Pedestrian Bridge SPK-2016-00682

Kelley, Matthew P SPK <Matthew.P.Kelley@usace.army.mil>  
To: Daniel Bastian <bastianengineeringinc@gmail.com>

Daniel,

The JD form that is to be signed is in the mail already. Unless the project changed from when the information was provided to me in September, a pre-construction notification will not be needed. Based on the information that was provided we determined that a permit will not be required for the proposed work. This was because there was not going to be a discharge of dredged or fill material into waters of the United States. If the project changes where a discharge of fill material is necessary, then we can process a permit. Let me know if you have any other questions. Thanks.

Matt

Matthew P Kelley  
Chief, Redding Regulatory Office  
US Army Corps of Engineers, Sacramento District  
310 Hermit Drive, Suite 310  
Redding, California 96002  
(530) 223-9534 Fax:(530) 223-9539  
matthew.p.kelley@usace.army.mil

We want to hear from you! Submit a customer service survey form.  
[http://corpsmap.usace.army.mil/cn\\_apex/f?p=regulatory\\_survey](http://corpsmap.usace.army.mil/cn_apex/f?p=regulatory_survey)  
Need information on the Regulatory Program?  
<http://www.spk.usace.army.mil/Missions/Regulatory.aspx>

-----Original Message-----

From: Daniel Bastian [mailto:[bastianengineeringinc@gmail.com](mailto:bastianengineeringinc@gmail.com)]  
Sent: Wednesday, October 26, 2016 8:42 AM  
To: Kelley, Matthew P SPK <Matthew.P.Kelley@usace.army.mil>  
Subject: [EXTERNAL] Re: Graeagle Creek Pedestrian Bridge SPK-2016-00682

Thanks Matt.

Your letter indicates that Tom needs to sign a Jurisdictional Determination Form. I did not see it with the email attachment. Is that something you can send via email so Tom can sign and we'll be ready for the Pre-Construction Notification?

On Tue, Oct 25, 2016 at 6:34 PM, Kelley, Matthew P SPK <Matthew.P.Kelley@usace.army.mil <mailto:Matthew.P.Kelley@usace.army.mil>> wrote:

<https://mail.google.com/mail/u/0/u=2&ik=1ak68bc22c&view=pt&q=mattew%20kelley%40usace.army.mil&qs=true&search=quary&sqf=15801b3cc2faf5d&smi=15801b3cc2faf5d>

# **APPENDIX F**

## Flood Study

The following flood study was prepared for a pedestrian bridge placement just downstream from the vehicular bridge on Highway 89. The pedestrian bridge location has since been located further downstream, as shown in Figure 2. The base flood elevations will be determined by the Graeagle CSD prior to abutment permitting with a revision of the following report. It is assumed that the base flood elevations will substantially match those noted in the following report.

# **GRAEAGLE CREEK FLOOD STUDY**

**April 2012**

**FOR**

**GRAEAGLE LAND WATER CO. & GRAEAGLE CSD  
PEDESTRIAN BRIDGE PROJECT**

PREPARED BY:

**BASTIAN ENGINEERING**

*213 POPLAR VALLEY RD., BLAIRDEN, CA. 96103 (530) 836-2644 dbcels@psln.com*  
**RCE 45489, LS 7045**



The status of this report is preliminary unless the appropriate signature is provided above. The signature will be provided after review is complete.

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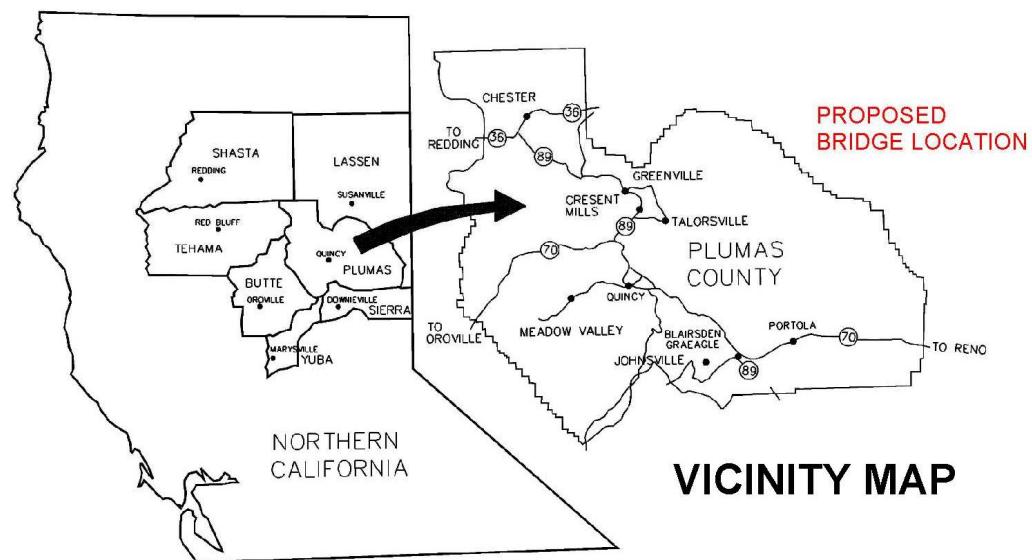
## Chapter 1

### INTRODUCTION

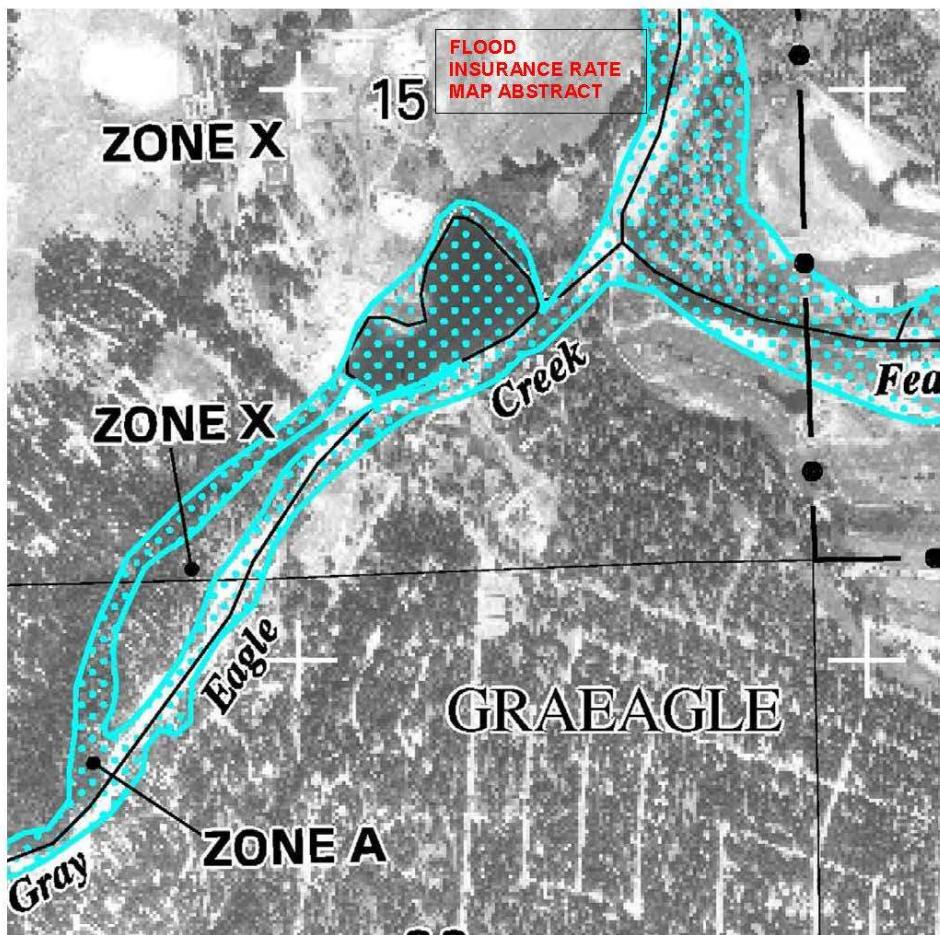
This report presents the results of the topographic, hydrologic and hydraulic factors used in the analysis of the improvements appurtenant to a proposed pedestrian bridge, to-be-located just downstream of the Highway 89/Graeagle Creek crossing, Graeagle, Plumas County, CA.

The bridge project is located in the town of Graeagle, CA. just north of the Highway 89 at the Graeagle Creek highway crossing.

Graeagle is located near the Middle Fork Feather River, approximately 45 miles northwest of Lake Tahoe and 68 miles west of the California-Nevada border (see Vicinity Map).



The proposed pedestrian bridge is in an "area of special flood hazard" identified by the Federal Insurance Administration of the Federal Emergency Management Agency and is subject to a one percent or greater chance of flooding in any given year. The area of special flood hazard (Zone A) is shown on the following page which is an abstract of the Flood Insurance Rate Map.



An application for a building development permit in Plumas County, CA for any man-made change to real estate in an area of special flood hazard shall "include an engineered analysis based on a uniform procedure prescribed by the County Engineer that has been completed, submitted to the County Engineer, reviewed and approved by the County Engineer, and copies thereof provided to the County Engineer, the Planning Director and the Building Official." (*Plumas County Code of Ordinances, Title 8, Chapter 17, Article 2, Section 8-17.205(f)*). A building development permit for the pedestrian bridge will be required. This report is intended to satisfy the required engineering analysis described above.

The Plumas County Engineer has indicated that the Federal Emergency Management Agency's Publication 265, "MANAGING FLOODPLAIN DEVELOPMENT IN APPROXIMATE ZONE A AREAS, A GUIDE FOR OBTAINING AND DEVELOPING BASE

(100-YEAR) FLOOD ELEVATIONS", dated April 1995 is permitted as a "uniform procedure" for this study. The detailed methodology described in this report is consistent with said Publication 265 and can also be used to develop the BFE information necessary to obtain a Letter of Map Amendment or a Letter of Map Revision Based on Fill from the Federal Emergency Management Agency to remove the pedestrian bridge from a special flood hazard area, if so desired.

## Chapter 2

---

### EXISTING ENVIRONMENT

#### 2.1 Project Site

The bridge project lies in the extreme northern portion of the Sierra Nevada geomorphic providence, generally characterized as a "tilted block" with its crest to the east. The Middle Fork of the Feather River flows through gentle mountain valleys of Mohawk Valley in this area. The tributary area comprises approximately 6,000 acres and is primarily in open space of natural condition consisting of perennial grasses, shrubs, evergreens - typical woodland environment.

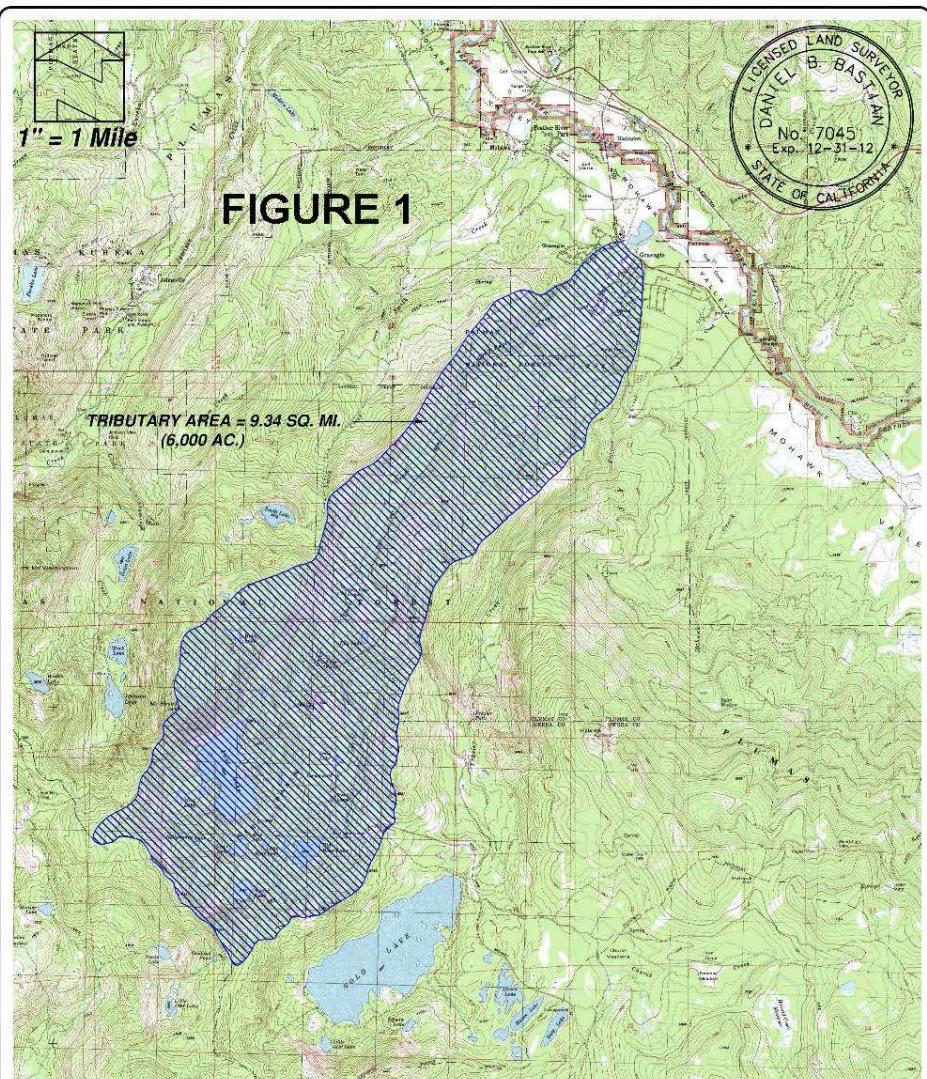
The State of California, Highway 89 Bridge 09-0029 (02-PLU-089-7.29, crossing Graeagle Creek) is located approximately 80 feet upstream from the proposed pedestrian bridge crossing.

#### 2.2 Topography

The tributary area slopes upward in a southwesterly direction from the proposed crossing. The lower and upper reach elevations are about 4,280' and 7,000' respectively. The topography was determined from aerial and site specific surveying.

Elevations are based on the North American Vertical Datum 1983. The USGS Quadrangle map for the tributary area is shown on Figure 1. Site specific topography is shown on Figure 2.

NOT TO SCALE



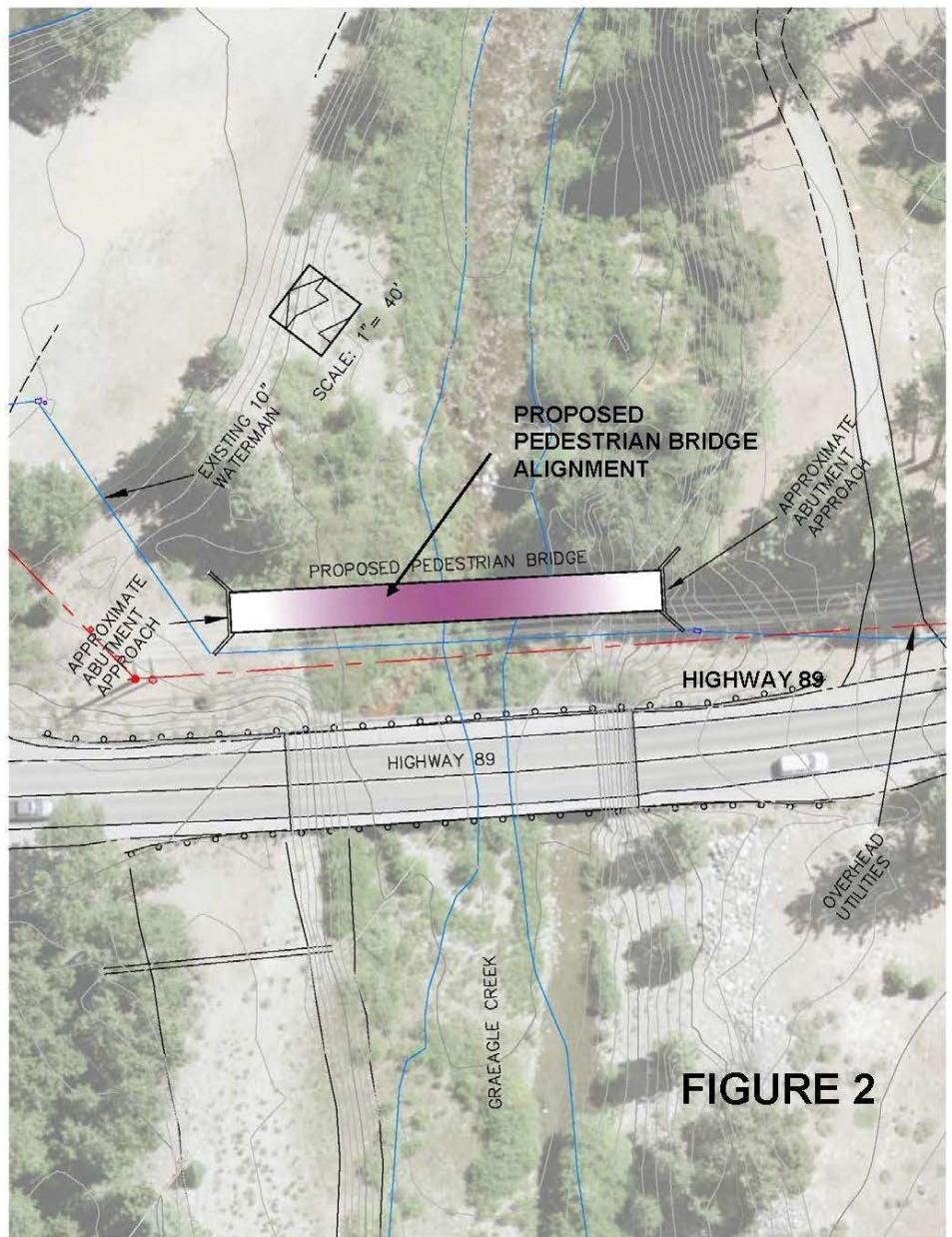
 **BASTIAN  
ENGINEERING**  
R.C.E. 45489, L.S. 7045  
213 POPLAR VALLEY RD., BLAIRSDEN CA. 96103  
(530) 836-2644

**GRAY EAGLE CREEK WATERSHED BOUNDARY  
GRAEAEGLE LAND & WATER CO  
PEDESTRIAN BRIDGE FLOOD STUDY**

DATE:  
12/11

SHT. 1 OF 1

C:\LAND PROJECTS 2005\GLW Ped Bridge\deg\GRAY EAGLE CREEK WATERSHED.dwg



**FIGURE 2**

2-6

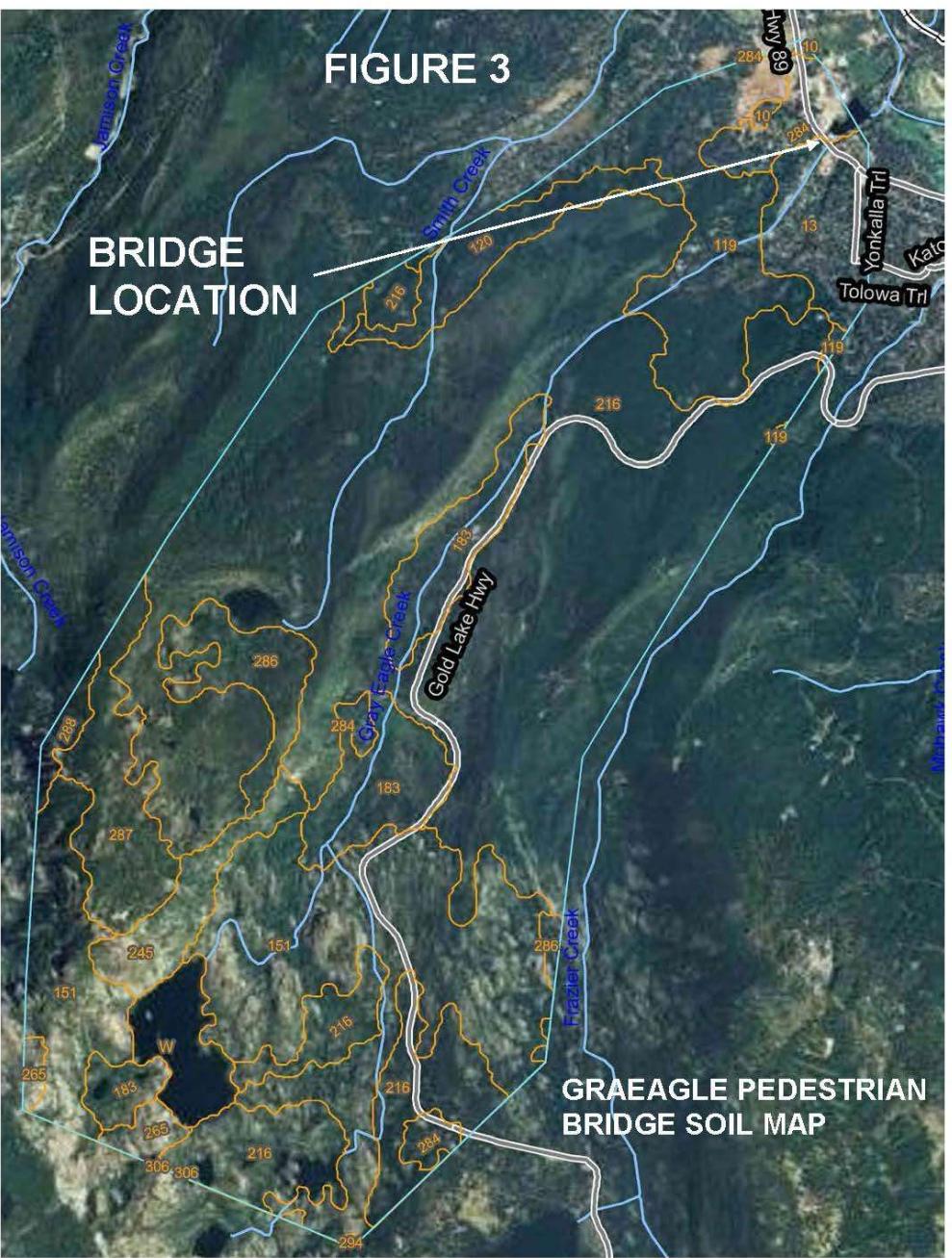
### **2.3 Hydrologic Soil**

Predominant soil type is quaternary lakebed sediments with alluvium deposits on the lower flats and rock outcrops higher-up in the tributary area. The U.S. Department of Agriculture and Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service (SCS) provides the following soil information (see Figure 3):

Plumas National Forest Area, California (CA713)	
Map Unit Symbol	Map Unit Name
10	Badenaugh very gravelly loam, 2 to 5 percent slopes.
13	Dotta loam, 2 to 5 percent slopes
119	Chaix-Wapi families complex, 2 to 30 percent slopes.
120	Chaix-Wapi families complex, 30 to 50 percent slopes
151	Dystric Lithic Xerochrepts-Smokey family complex, 50 to 80 percent slopes
183	Goodlow-Haplaquolls complex, 0 to 10 percent slopes
216	Inville-Woodseye families complex, 10 to 50 percent slopes
245	Rock outcrop-Dystric Lithic Xerochrepts complex, 50 to 85 percent slopes
265	Smokey family, 10 to 50 percent slopes
284	Urban land
286	Uvi-Smokey families complex, 0 to 30 percent slopes
287	Uvi-Smokey families complex, 30 to 50 percent slopes
288	Uvi-Smokey families complex, 50 to 70 percent slopes
294	Waca-Woodseye families complex, 30 to 50 percent slopes
306	Woodseye-Waca families-Rock outcrop complex, 50 to 70 percent slopes

Erosion of "natural" slopes in the area is moderate. Significant erosion and sedimentation can take place on the steeper slopes when they are disturbed, or the surface bared. Scour is particularly evident in the area watercourses, with some channels that include head-cuts and near vertical banks (evidence of moderate to high erosion ala Frazier Creek.)

No evidence of ground disturbance due to slides or soil slumps was observed.



2-8

The NRCS has instituted a soil classification system for the entire Country and the soil classifications for the project area are shown on Figures 3 & 4. Soil properties influence the relationship between rainfall and runoff by affecting the rate of infiltration. These soil classifications and soil cover allows the engineer to select Curve Numbers that relate to the drainage characteristics of the soil groups.

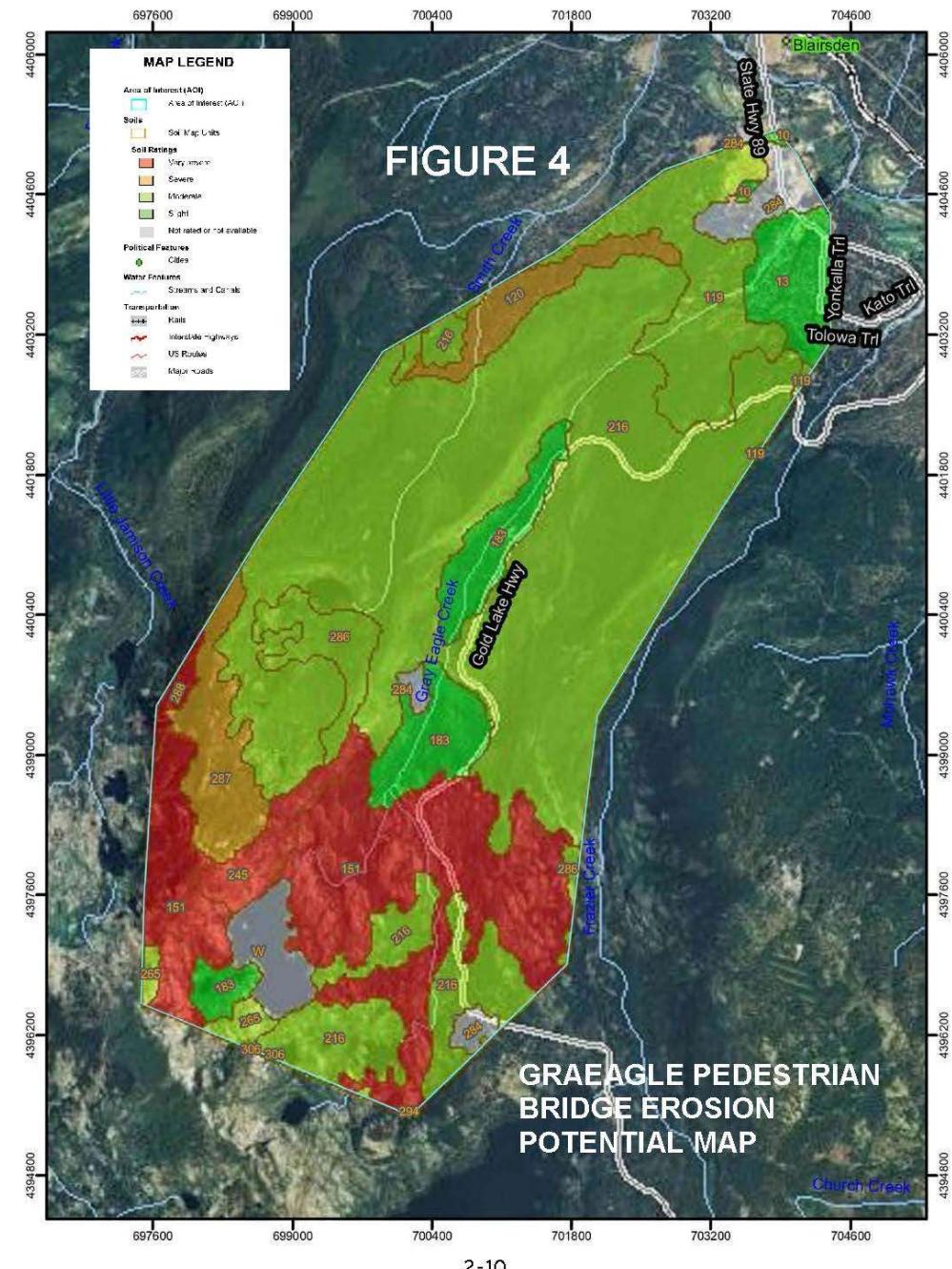
NRCS divides soils into four hydrologic soil groups based on infiltration rates (Groups A-D).

- ❖ *Group A.* Group A soils have a low runoff potential due to high infiltration rates even when saturated (0.30 in/hr to 0.45 in/hr or 7.6 mm/hr to 11.4 mm/hr). These soils primarily consist of deep sands, deep loess, and aggregated silts.
- ❖ *Group B.* Group B soils have a moderately low runoff potential due to moderate infiltration rates when saturated (0.15 in/hr to 0.30 in/hr or 3.8 mm/hr to 7.6 mm/hr). These soils primarily consist of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures (shallow loess, sandy loam).
- ❖ *Group C.* Group C soils have a moderately high runoff potential due to slow infiltration rates (0.05 in/hr to 0.5 in/hr or 1.3 mm/hr to 3.8 mm/hr if saturated). These soils primarily consist of soils in which a layer near the surface impedes the downward movement of water or soils with moderately fine to fine texture such as clay loams, shallow sandy loams, soils low in organic content, and soils usually high in clay.
- ❖ *Group D.* Group D soils have a high runoff potential due to very slow infiltration rates (less than 0.05 in./hr or 1.3 mm/hr if saturated). These soils primarily consist of clays with high swelling potential, soils with permanently high water tables, soils with a clay pan or clay layer at or near the surface, shallow soils over nearly impervious parent material such as soils that swell significantly when wet or heavy plastic clays or certain saline soils.

For a particular drainage basin the average CN values were calculated using the total acreage as a basis for the averaging. The average CN value as follows:

$$\begin{aligned} \text{CN}_{\text{ave}} &= [(D \times \text{CN}_{77}) + (C \times \text{CN}_{70}) + (B \times \text{CN}_{55})] / \text{Total Acres} \\ &= [(1620 \times 77) + (300 \times 70) + (4080 \times 55)] / 6000 \\ &= 62 \end{aligned}$$

A combination of hydrologic soil group and land use/treatment class is termed "hydrologic soil-cover complex" in the Soil Conservation Service (SCS) method. Runoff curve numbers (CNs) are associated with such complexes for the SCS method. For purposes of this study, the pre-project cover type used was "Woods" with a hydrologic condition of "Good." As defined in table 9-1, Chapter 9 "Hydrologic Soil-Cover Complexes" of Part 630 Hydrology, National Engineering Handbook, a "Good" hydrologic condition indicates that "the woods are protected from grazing, and litter and brush adequately cover the soil."



## Chapter 3

### HYDROLOGY

#### 3.1 Rainfall Depth and Distribution

The appropriate rainfall depths and temporal distributions for the drainage basin were obtained from Bulletin 195 (*California Department of Water Resources (1976), Rainfall Analysis for Drainage Design, Volume I: Short-Duration Precipitation Frequency Data and Volume II: Long-Duration Precipitation Frequency Data, Bulletin No. 195 Sacramento: State of California, Resources Agency*). Bulletin 195 is the primary source of statistics on the frequency of intense precipitation events for stations in California. It includes statistics on short-duration rainfall events lasting between 5 minutes and 24 hours and long-duration events lasting between 1 day and 1 year.

No intensity duration frequency curve (IDF) is available for the Graeagle Creek basin. The nearest basin curve with similar characteristics is located in Portola (Portola IDF curve is included in Appendix A). Computed rainfall depths vs. time are noted below for the 100 frequency of occurrence of said station.

PORTOLA RAINFALL, in. (EL. 4838)								
Duration	5 min	15 min	1 hr	2 hr	3 hr	6 hr	12 hr	24 hr
100 - YR	0.25	0.42	0.8	1.00	1.2	1.80	2.34	3.36

Allowances for snowmelt, which is assumed to be the primary base flow in the basin was added to the storm runoff hydrograph to obtain the design flood hydrograph for the watershed. The base flow from snow melt was assumed to be 0.10 in/hr for the 100 year design event (*Placer County Flood Control and Water Conservation District Stormwater Manual, Ver. 3, Page V-4, February 1994*). The base flow is therefore computed to be 64.5 cfs/mi.<sup>2</sup> It has been assumed that antecedent storms have saturated the drainage basin so that loss rates are fairly low during the design event.

#### 3.2 Hydrograph Transformation

The transformation of excess rainfall to runoff was accomplished using NRCS Technical Release 55 (TR-55) Urban Hydrology for Small Watersheds. TR-55 is a simplified procedure to calculate the storm runoff volume, peak rate of discharge, hydrographs and storage volumes required for storm water management structures.

TR-55 hydrology has the capacity to analyze watersheds that meet these criteria:

Variable	Limits
Minimum area	No absolute minimum is included in the software. The user should carefully examine results from sub-areas less than 1 acre.
Maximum area	25 square miles (6,500 hectares)

Variable	Limits
Number of Subwatersheds	1-10
Time of concentration for any sub-area	0.1 hour < Tc < 10 hour
Number of reaches	0-10
Types of reaches	Channel or Structure
Reach Routing	Muskingum-Cunge
Structure Routing	Storage-Indication
Structure Types	Pipe or Weir
Structure Trial Sizes	1-3
Rainfall Depth	Default or user-defined0 – 50 inches (0-1,270 mm)
Rainfall Distributions	NRCS Type I, IA, II, III, NM60, NM65, NM70, NM75, or user-defined
Rainfall Duration	24-hour
Dimensionless Unit Hydrograph	Standard peak rate factor 484, or user defined
Antecedent Moisture Condition	2 (average)

The peak rate of discharge for the Graeagle Creek basin was determined to be 2,550 cfs. The TR-55 result of 1,945 cfs (see Appendix B for the output results) was added to the base flow of 603 cfs ( $64.5 \text{ cfs}/\text{mi}^2 \times 9.34 \text{ mi}^2$ )

## **Chapter 4**

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### **HYDRAULICS**

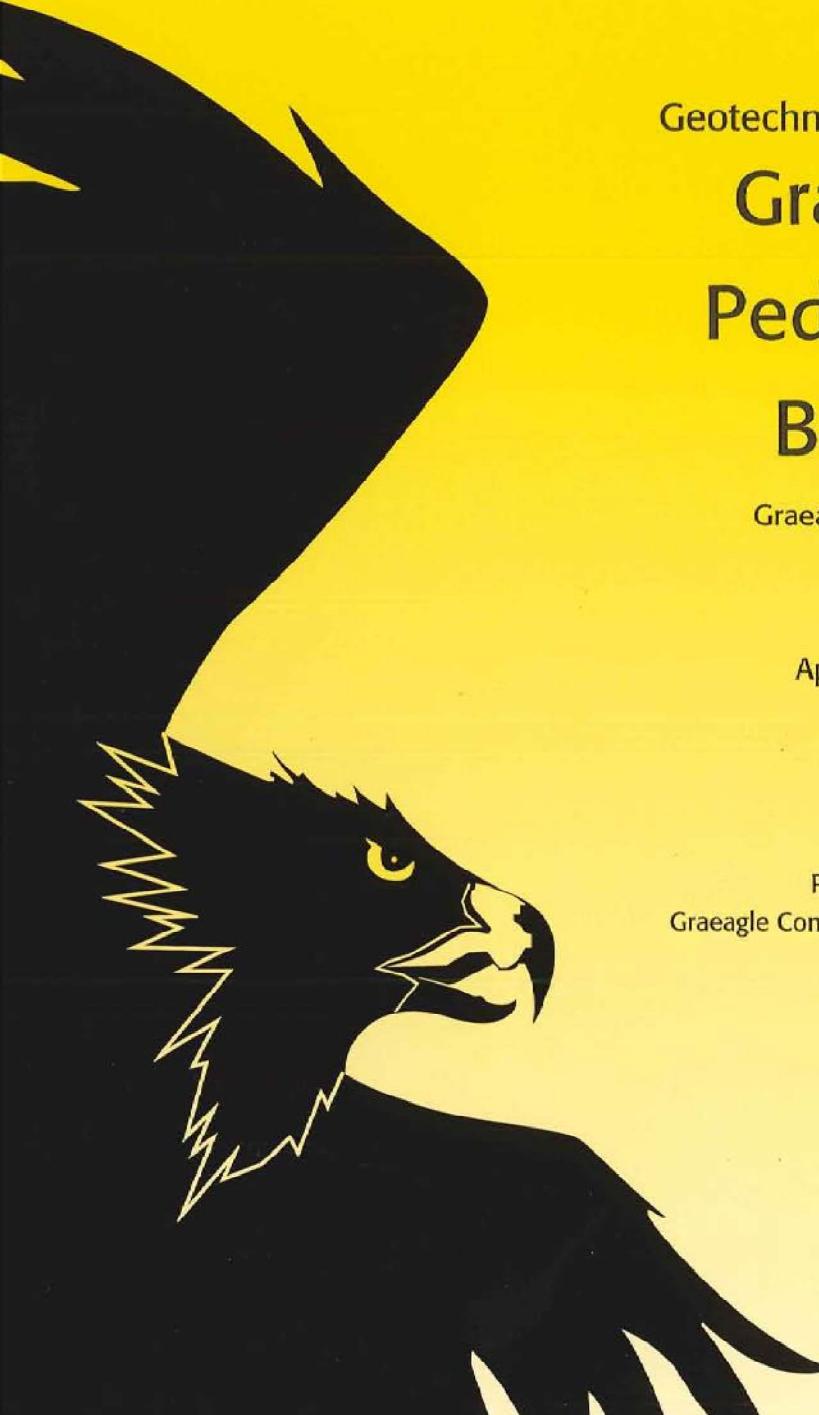
The U.S. Army Corps of Engineers HEC-RAS computer model was used; assuming a steady state gradually varied flow, to calculate water surface profiles and established the 100-year floodplain. The computations used the one-dimensional energy equation with energy loss due to friction (evaluated with Manning's equation). The tabulated results of the HEC-RAS model are included in Appendix C and the 100-year floodplain is shown the on Base Flood Elevation (BFE) map included in Appendix D.

The depicted floodplain aerial extent, shown on the BFE map, corresponds to the "approx. high water elevation" shown on the August 3, 1954 As-Built bridge plans (see Appendix E).

A clear span pedestrian bridge is currently being considered. Figure 3 and the BFE map anticipate that there will be no bridge abutment or pier encroachments into the floodway. The proposed pedestrian bridge will be elevated to provide adequate flow-through of debris. If encroachments into the floodway result from changes in the design philosophy noted above, then the BFE will necessarily need to be revised by addendum to this study.

# **APPENDIX G**

## Geological Investigation



**Black Eagle Consulting, Inc.**

Geotechnical Investigation

**Graeagle**

**Pedestrian**

**Bridge**

Graeagle, California

April 9, 2014

Prepared for  
Graeagle Community Services District



**Black Eagle Consulting, Inc.**  
Geotechnical & Construction Services

Mr. Tom Balestri  
Graeagle Community Services District  
PO Box 1414  
Graeagle, CA 96103

April 9, 2014  
Project No.: 1724-01-1

L

RE: Geotechnical Investigation  
Pedestrian Bridge  
Graeagle, California

Dear Mr. Balestri:

Black Eagle Consulting, Inc. (BEC) is pleased to present the results of our geotechnical investigation for the above referenced project. Our investigation consisted of research, field exploration, laboratory testing, and engineering analysis to allow formulation of geotechnical conclusions and recommendations for design and construction of this facility.

The proposed bridge structure will parallel the existing U.S. Highway 89 in the Graeagle community area of Plumas County, California, providing pedestrian access across the Gray Eagle Creek. Only preliminary design of the proposed structure has been completed at the time of this report. It is anticipated that the proposed pedestrian bridge will be a single-span structure around 10 feet wide and 140 to 150 feet long. The preliminary design of the bridge structure itself includes a steel-framed structure with vertical and diagonal bracing along the sides that attach to top and bottom chords. Floor beams and additional bracing will connect to the bottom chord and support stringers that run the length of the bridge and provide support to the surfacing system. The bridge super structure will rest on two cantilever end abutments and be secured using base plates and anchor bolts (seat-type abutments).

The site is suitable to host the proposed pedestrian bridge subject to the recommendations presented in the attached report. Ground water was encountered as shallow as 2.5 feet below the existing ground surface in the proposed area of the northern abutment. Seasonal variation of the creek elevation will result in ground water within abutment footing excavations such that dewatering will be required, as discussed in the Site Preparation section of the attached report. The project area is generally underlain by coarse-grained stream deposits that include a substantial amount of cobbles and boulders. These materials will make site preparation, excavation, trenching, and finish grading more difficult, as discussed in the Site Preparation and Trenching and Excavation sections. If clay soils are present at abutment footing elevation, they will require over-excavation, as described in the Site Preparation section. Properly prepared native granular soils are suitable to directly support structural improvements and for use as fill materials, as specified in the Mass



**Black Eagle Consulting, Inc.**  
Geotechnical & Construction Services

1345 Capital Boulevard, Suite A  
Reno, Nevada 89502-7140

Tel: 775/359-6600      Fax: 775/359-7766  
Email: mail@blackeagleconsulting.com

Mr. Tom Balestri  
Graeagle Community Services District  
PO Box 1414  
Graeagle, CA 96103

April 9, 2014  
Project No.: 1724-01-1

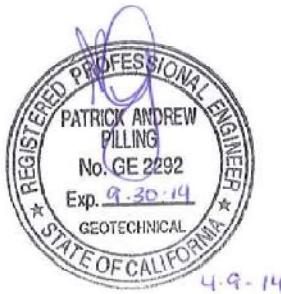
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Grading section. The mass grading and trenching that will be required to prepare the site will generate a significant amount of oversize rock that will result in a high variability of shrinkage/expansion during grading with these materials, as discussed in the Subsidence and Shrinkage section.

We appreciate having the opportunity to work with you on this project. If you have any questions regarding the content of the attached report, please do not hesitate to contact me.

Sincerely,

Black Eagle Consulting, Inc.



Patrick Pilling, Ph.D., P.E., G.E., D.GE.  
President

Jeff Wilbrecht, P.E.  
Project Engineer

Copies to:      Addressee (4 copies, PDF via email)  
                  Daniel B. Bastian (2 copies, PDF via email)

PAP:PV:JW:ajd/kad/mrc



**Black Eagle Consulting, Inc.**  
Geotechnical & Construction Services

1345 Capital Boulevard, Suite A  
Reno, Nevada 89502-7140

Tel: 775/359-6600      Fax: 775/359-7766  
Email: mail@blackeagleconsulting.com

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## Introduction

Presented herein are the results of the Black Eagle Consulting, Inc.'s (BEC's) geotechnical investigation, laboratory testing, and associated geotechnical design recommendations for the proposed pedestrian bridge that will span Gray Eagle Creek in the Graeagle community area of Plumas County, California. These recommendations are based on surface and subsurface conditions encountered in our exploration and details of the proposed project as described in this report. The objectives of this study were to:

1. Determine general soil and ground water conditions pertaining to design and construction of the proposed pedestrian bridge.
2. Provide recommendations for design and construction of the proposed bridge, as related to these geotechnical conditions.

The area covered by this report is shown on Plate 1 (Plot Plan). Our investigation included field exploration, laboratory testing, and engineering analysis to determine the physical and mechanical properties of the various on-site materials. Results of our field exploration and testing programs are included in this report and form the basis for all conclusions and recommendations.

The services described above were conducted in accordance with BEC's Professional Services Agreement dated December 26, 2013, that was signed by Tom Balestri of the Graeagle Community Services District.



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## Project Description

The proposed pedestrian bridge site is located east of the existing two-lane bridge of U.S. Highway 89 that crosses the Gray Eagle Creek in Plumas County, California. The site is entirely contained in Section 15, Township 22 North, Range 12 East, Mount Diablo Meridian. The proposed bridge site is bordered to the north by a vacant, undeveloped gravel parking lot; the east by the lower section of Gray Eagle Creek and the Graeagle Mill Pond; the south by undeveloped land; and the west by the existing U.S. Highway 89 Gray Eagle Creek bridge structure. Access to the site was obtained by U.S. Highway 89.

### Structure Information

The proposed bridge structure will parallel the existing U.S. Highway 89 in the Graeagle community area of Plumas County, California, providing pedestrian access across Gray Eagle Creek that flows to the Graeagle Mill Pond.

Only preliminary design of the proposed structure has been completed at the time of this report. It is anticipated that the proposed pedestrian bridge will be a single-span structure around 10 feet wide and 140 to 150 feet long. The preliminary design of the bridge structure itself includes a steel-framed structure with vertical and diagonal bracing along the sides that attach to top and bottom chords. Floor beams and additional bracing will connect to the bottom chord and support stringers that run the length of the bridge and provide support to the surfacing system. The bridge superstructure will rest on two cantilever end abutments and be secured using base plates and anchor bolts (seat-type abutments).

The structural load information for the bridge abutments is not currently available. Since the live loads on the bridge will only be associated with pedestrians and bicyclists, the factored loads on the bridge abutments are anticipated to be low to moderate. The anticipated low to moderate structural loads suggest that the bridge abutments can be founded on shallow spread foundations. The abutments' foundations are expected to be around 12 to 15 feet long by 5 to 10 feet wide. We assume the abutments will be aligned perpendicular to the bridge deck alignment.

The bridge will also possibly include a carrier pipe beneath the pathway for water and sewer main lines to cross Gray Eagle Creek.



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A detailed scour analysis had not been performed for this structure at the time of this report. As-built documents for the U.S. Highway 89 Bridge show footings constructed roughly 12 feet below the base of the creek channel and corresponding low water elevation. Based on this information and on information from the project civil engineer, Bastian Engineering, Inc., it is our understanding that the subject bridge will have footing elevations set at a similar elevation.

## Grading Concepts

Only preliminary design of the site grading is available at the time of this report. Cuts and fills for the approach will be required for the pedestrian bridge. The finished alignment will be surfaced with asphalt concrete paving that will join the existing walking path along U.S. Highway 89.

Excavation into the underlying cobble and boulder-rich river deposits will likely be difficult and encounter particles in excess of 4 feet in nominal diameter.

The excavations for the abutment foundations will encounter ground water, which is at, or near, the adjacent creek elevation. As a result, dewatering is anticipated for the construction of the bridge abutments.

## Bridge Design Standards

Since the pedestrian bridge is to be located adjacent to U.S. Highway 89, the design should follow California Department of Transportation (CalTrans) bridge design standards (CalTrans, 2008) and its subsequent updates. The CalTrans adopted and follows the American Association of State Highway and Transportation Officials (AASHTO) bridge design standards with some amendments. The geotechnical design parameters for the proposed bridge have been developed using the procedures and methodologies outlined in the AASHTO *Load Resistance Factor Design (LRFD) Bridge Design Specifications, Sixth Edition* (AASHTO, 2012) and CalTrans *Bridge Design Specifications* (CalTrans, 2008). The seismic design parameters for the bridge were developed using the procedures and methodologies outlined in CalTrans *Seismic Design Criteria* (CalTrans, 2012; 2013a; 2013b).



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## Site Conditions

### Existing Structures

The existing U.S. Highway 89 bridge structure was built in the 1950s, constructed using T-beams and cast-in-place concrete. This structure is a two-lane roadway, just under 100 feet long with a narrow shoulder on the west side and a 9-foot-wide shoulder on the east side, which is the current route for pedestrians to cross the creek. The bridge deck has a bituminous wearing surface. It is assumed that the structure is supported by shallow mat foundations bearing on native soils.

Areas north and south of the proposed pedestrian bridge include gravel-surfaced parking areas and roadways that lead to a convenience store to the north and undeveloped land and a group of cabins to the south. The Graeagle Mill Pond is located down stream of Gray Eagle Creek, which contributes to the Middle Fork of the Feather River. The remains of an old building and its concrete foundation exists further east of the proposed location for the southern abutment; the concrete has deteriorated such that it is likely very old.



Existing Conditions  
(View north from South Abutment)

### Topography

The Graeagle area is located near the middle of Mohawk Valley which continues in a northeast to southwest direction within the eastern boundary of the northern Sierra Nevada Mountain Range. Local topography in the area of the proposed bridge has been generated through the continued evolution of the Gray Eagle Creek channel that flows in a northeasterly direction towards the Graeagle Mill Pond. The lower portions of the creek banks are populated with cobbles and boulders of various size and show typical signs of seasonal flow events that occur as part of normal runoff and precipitation.



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The original topography along the northern bank of the creek, within the area of the existing U.S. Highway 89 bridge and upstream of the proposed improvements, has been filled from the original slope to a slope that exhibits an approximate 2H:1V (horizontal to vertical) slope ratio in order to accommodate the U.S. Highway 89 northern approach. This fill extends southeastward (upstream) about 130 feet. The fill was not observed or encountered as encroaching into the proposed abutment area.

The south bank of the creek consists of a series of terraces that eventually meet the grade of the nearby roadway, which is approximately 13 to 15 feet above the observed creek elevation. The observed elevation is expected to be at or near the seasonal low flow because our field work was conducted in January 2014. The uneven topography within this southern portion is due to rearranging of materials during peak flow events.

## Vegetation

The banks of the Gray Eagle Creek within the area of proposed abutments is moderately to densely populated with native brush and bushes up to 10 feet high with branches up to 4 inches in diameter. Mature Pine and Aspen trees with trunks up to 24 inches in diameter also exist within the surrounding area.



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# Exploration

## Drilling

The pedestrian bridge site was explored on January 9 and 13, 2014, by drilling three test borings. The borings were drilled using a truck-mounted CME 55 soil sample drill rig with mud-rotary drilling techniques. The drilling and sampling were performed in general accordance with the American Society for Testing and Materials (ASTM) D 6066. A 6-inch-outside-diameter (O.D.), 3-1/4-inch-inside-diameter (I.D.), hollow-stem auger was used through a depth of 15 feet to maintain the open hole in boring B-01, due to the difficult drilling conditions encountered at the near surface cobbles and boulders and to minimize the tendency of borehole collapse. Drilling refusal was encountered at borings B-02 and B-03, both located within the vicinity of the southern abutment, due to very dense boulder, cobble, and soil matrices. Refusal of these two test borings occurred at 5.5 feet below the ground surface. The maximum depth of exploration was 36.5 feet below the existing ground surface in boring B-01. The locations of the test borings are shown on Plate 1.

The native soils were sampled in-place every 2.5 to 5 feet by use of a standard, 2-inch-O.D., split-spoon sampler driven by a 140-pound safety drive hammer with a 30-inch stroke operated with a rope and cathead. The number of blows to drive the sampler the final 12 inches of an 18-inch penetration (Standard Penetration Test [SPT] - ASTM D 1586) into undisturbed soil is an indication of the density and consistency of the material.

Twelve other borings were attempted in the southern abutment area but were unsuccessful at penetrating the very dense boulder, cobble, and soil matrices and were unable to retrieve soil samples. Refusal of these borings occurred at 2.5 feet below the ground surface or less.



Exploration – Drilling  
Northern Abutment



Exploration – Drilling  
Southern Abutment



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Due to the relatively small diameter of the samplers, the maximum particle size that could be obtained was approximately 1.25 inches. The final boring logs may not, therefore, adequately represent the actual quantity or presence of cobbles or boulders where soils were not observed at or near the surface during exploration.

Ground water levels were measured, where encountered.

### Test Pits

Due to the limited drilling depths achieved in the area of the southern abutment, a test pit was excavated on January 15, 2014, using a Cat® 310SG backhoe. The location of the test pit is included on Plate 1. The maximum depth of exploration was 14.25 feet below the existing ground surface. Bulk samples for index testing were collected from the trench wall sides at specific depths in each soil horizon. Pocket penetrometer testing was performed in exposed, fine-grained soil strata to evaluate in-place, unconfined compressive strength for evaluating trench stability. The test pit was backfilled immediately after exploration. Backfill was loosely placed and the area re-graded to the extent possible with equipment on hand.



Exploration – Test Pitting  
South Abutment

Ground water levels were measured, where encountered.



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## Material Classification

A geotechnical engineering technician examined and identified all soils in the field in accordance with ASTM D 2488. During drilling, representative bulk samples were placed in sealed plastic bags and returned to our Reno, Nevada, laboratory for testing. Additional soil classification was subsequently performed in accordance with ASTM 2487 (Unified Soil Classification System [USCS]) upon completion of laboratory testing, as described in the **Laboratory Testing** section. Logs of the borings and test pits are presented as Plate 2 (Boring and Test Pit Logs), and a USCS chart has been included as Plate 3 (USCS Soil Classification Chart).



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## Laboratory Testing

All soils testing performed in BEC's laboratory is conducted in general accordance with the standards and methodologies described in Volume 4.08 of the ASTM Standards.

### Index Tests

Samples of each significant soil type were analyzed to determine their in-situ moisture content (ASTM D 2216), grain size distribution (ASTM D 422), and plasticity index (ASTM D 4318). The results of these tests are shown on Plate 4 (Index Test Results). Test results were used to classify the soils according to ASTM D 2487 and to verify field logs, which were then updated appropriately. Classification in this manner provides an indication of the soil's mechanical properties and can be correlated with standard penetration testing and published charts (Bowles, 1996; Naval Facilities Engineering Command [NAVFAC], 1986a and b) to evaluate bearing capacity, lateral earth pressures, and settlement potential.



Grain Size Analysis

### Direct Shear Tests

A direct shear test (ASTM D 3080) was performed on a representative sample of clay soils. The test was run on a remolded, inundated sample under various normal loads in order to develop a Mohr's strength envelope. The remolded sample was screened to remove particles larger than the number 4 sieve prior to testing. Results of these tests are shown on Plate 5 (Direct Shear Test Results) and were used in calculation of bearing capacities, friction factors, and lateral earth pressures.



Direct Shear Test



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## Chemical Tests

Chemical testing was performed on representative samples of site foundation soils to evaluate the site materials' potential to corrode steel and Portland cement concrete (PCC) in contact with the ground. The samples were tested for pH, resistivity, redox potential, soluble sulfates and sulfides. The results of the chemical tests are shown on Appendix B (Chemical Test Results). Chemical testing was performed by Sierra Environmental Monitoring of Sparks, Nevada.



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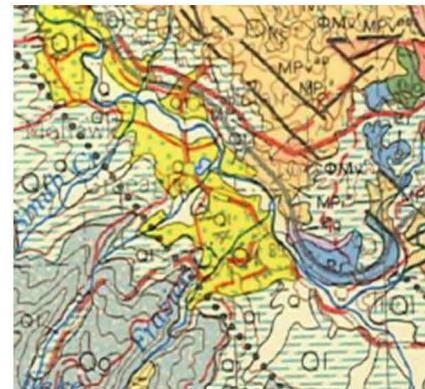
## Geologic and General Soil Conditions

The California Geological Survey (CGS), formerly the California Division of Mines and Geology (CDMG), has mapped the area as being within an area between Holocene-aged Fan deposits and Alluvium (Saucedo and Wagner, 1992). The fan deposits include gravel, sand and silt. The alluvium deposits are described as *undivided alluvial deposits of unconsolidated gravel, sand, and silt. Locally may include fan deposits, colluvium, and older alluvium.*

The soils encountered during exploration generally match the geologic unit described by the CGS. The proposed pedestrian bridge will span Gray Eagle Creek, whose associated banks consist of river deposits dominated by varying sizes of cobbles and boulders within the soil matrices. The cobble-boulder-soil matrix extends to about 10 to 15 feet below the elevation of U.S. Highway 89. The underlying soil units are generally void of oversized particles and consist of soils with a higher content of non-plastic to high plasticity fines.

The river deposits, which contain abundant oversized particles, include silty, clayey gravel with sand and poorly graded gravel with sand. These gravel-rich soils were commonly described as gray to brown to dark brown, moist to wet, and medium dense to very dense. They were classified as containing 2 to 15 percent non-plastic to low plasticity fines and 30 to 65 percent rounded to subangular gravel. These soils contain cobbles and boulders up to 2.5 feet in diameter that is estimated to be to about 60 percent of the total soil mass.

The coarse-grained river deposits are underlain by soils with a relatively higher fine content. All of these soils were encountered below the ground water table and generally classified as clayey sands, lean clays with sand, silty sands, and sandy silts. These soils were commonly described as gray to dark gray to dark brown, wet, and dense to very dense or very stiff to hard. They contain 20 to 80 percent non-plastic to high plasticity fines with up to 15 percent gravel particles.



Geologic Map



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## Geologic and General Soil Conditions

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Boulders up to 6 feet in diameter were observed along the southern bank of the creek channel, downstream from the proposed bridge location.

Ground water was encountered in boring B-01 at 2.5 feet below the existing ground elevation and in test pit TP-01 at a depth of 8.0 feet.



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## Geologic Hazards

### Faulting and Ground Rupture

The Alquist-Priolo Earthquake Fault Zoning Act was originally signed into law in 1972 as the Alquist-Priolo Geologic Hazard Zones Act in order to prohibit the location of most structures for human occupancy across the traces of active faults and to thereby mitigate the hazard of fault rupture (*Alquist – Priolo Earthquake Fault Zoning Act*, 1993). Under this act, the State Geologist is required to delineate Earthquake Fault Zones (EFZs) and counties affected by the zones must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting. Classification of a fault as potentially active requires investigation, analysis, and judgment by a qualified geologist. The Alquist-Priolo Earthquake Fault Zones across the State of California have been identified and mapped in the CGS publication titled, *Fault-Rupture Hazard Zones in California* (Bryant and Hart, 2007). The Alquist-Priolo Earthquake Fault Zone maps are regularly updated and/or revised (latest revision dated September 21, 2012) by the State Geologist (CGS, 2014).

Plumas County, California, does not include any established Alquist-Priolo EFZs (Bryant and Hart, 2007; CGS, 2014). Therefore, no further fault investigation is considered necessary for the proposed structure. Since the site is not located in any established Alquist-Priolo EFZs, the potential for ground rupture at the project site is considered low.

It shall be noted Alquist-Priolo Geologic Hazard Zones Act and Alquist-Priolo EFZs only address the potential damages to the structure associated with the surface faulting or fault creep. Potentially active faults are located in the vicinity of the project site, including Mohawk Valley Fault that is capable of producing a maximum earthquake magnitude of 6.6 (CalTrans, 2013a). The northern end of this nearby fault is located about 1.5 miles south of the bridge site. The site's proximity to potentially active Mohawk Valley Fault will yield in relatively higher design response spectrum as described below.



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## Seismicity and Ground Motion

Graeagle lies within an area with a potential for strong earthquake shaking due to its proximity to potentially active Mohawk Valley Fault (CalTrans, 2013a).

Based on CalTrans design methodologies, the design acceleration response spectrum (ARS) should be developed from the estimated maximum design acceleration values using both deterministic and probabilistic approaches (CalTrans, 2012; 2013b). A maximum design ARS envelop is plotted to enclose design ARS developed from the deterministic approach considering a selected number of nearby faults and the design curve developed using the probabilistic approach that uses the 2008 United States Geological Survey (USGS) earthquake data and a 5 percent probability of exceedance in 50 years (975 years return period). The developed design ARS is also compared with a state-wide minimum design ARS. The entire analysis can be performed using an online application that is present in the CalTrans website (CalTrans, 2013a).

The proposed bridge site is located approximately at latitude 39.765 degrees north and longitude 120.617 degrees west. Based on the conditions encountered during site exploration and our knowledge of the general geology of Graeagle area, a Site Class D can be assumed for the subsurface soils at the site to host the proposed bridge. With this assumption, the seismic design criteria for the proposed bridge are presented in Table 1 (Seismic Design Criteria).



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TABLE 1 – SEISMIC DESIGN CRITERIA<sup>1</sup>

Period, T (Second)	Design Spectral Acceleration Coefficient, Sa
0.01	0.427
0.05	0.567
0.10	0.680
0.15	0.764
0.20	0.830
0.25	0.837
0.30	0.849
0.40	0.845
0.50	0.811
0.60	0.775
0.70	0.746
0.85	0.697
1.00	0.652
1.20	0.559
1.50	0.455
2.00	0.335
3.00	0.203
4.00	0.139
5.00	0.104

<sup>1</sup> Using the CalTrans (2013a).

It shall be noted that AASHTO (2012) recommends only using a probabilistic approach to develop seismic design criteria, and a 7 percent probability of exceedance in 75 years (1,000-year return period) based on 2008 USGS earthquake data. The design spectral acceleration coefficients at zero and longer periods using AASHTO (2012) are relatively lower than the above provided values at similar periods using



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CalTrans (2013a) methodology, where a deterministic approach is being considered in addition to a probabilistic approach.

## Liquefaction

Liquefaction is a nearly complete loss of soil shear strength that can occur, during a seismic event, as cyclic shear stresses cause excessive pore water pressure between the soil grains. This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non-plastic fines) lying below the ground water table. The higher the ground acceleration caused by a seismic event, the more likely liquefaction is to occur. Severe liquefaction can result in catastrophic settlements of large civil structures.

Mud-rotary drilling techniques were employed during our site investigation to aid in the liquefaction analysis. The anticipated shallow ground water table and subsurface soils consisting of stream deposits necessitated the evaluation of liquefaction potential of subsurface soils at the bridge site. Our exploration reveals that the site area is underlain by a surficial boulder, cobble, and soil matrices to about 8 to 9 feet below the existing ground surface, followed by dense clayey sands and hard, fine-grained soils with a shallow ground water table.

Observation and sampling during mud-rotary exploration activities generally indicate that the underlying submerged gravel soils were uniformly populated with oversized cobbles and boulders. The underlying sand and fine-grained soils were of high density such that drilling and sampling through these materials was very difficult, as identified through the consistently high blow counts. Because of the very dense nature of the site subsurface soils, as encountered in boring B-01, the potential for soil liquefaction is negligible at the site.

## Flood Plains

The Federal Emergency Management Agency (FEMA) has identified the site as lying in Zone A with a 1 percent annual chance of flood (100-year flood). This zone has no base flood elevations determined (FEMA, 2005).



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## Other Geologic Hazards

A moderate potential for dust generation is present if grading is performed in dry weather. Clay soils are present below the ground water table and, as such do not exhibit any appreciable expansion potential in this state. No other geologic hazards were identified.



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## Discussion and Recommendations

### General Information

The site is suitable to host the proposed pedestrian bridge. Ground water was encountered as shallow as 2.5 feet below the existing ground surface in the proposed area of the northern abutment. Seasonal variation of the creek elevation will result in ground water within abutment footing excavations such that dewatering will be required, as discussed in the **Site Preparation** section. The project area is generally underlain by coarse-grained stream deposits that include a substantial amount of cobbles and boulders. These materials will make site preparation, excavation, trenching, and finish grading more difficult, as discussed in the **Site Preparation** and **Trenching and Excavation** sections. If clay soils are present at abutment footing elevation, they will require over-excavation, as described in the **Site Preparation** section. Properly prepared native granular soils are suitable to directly support structural improvements and for use as fill materials, as specified in the **Mass Grading** section. The mass grading and trenching that will be required to prepare the site will generate a significant amount of oversized rock that will result in a high variability of shrinkage/expansion during grading with these materials, as discussed in the **Subsidence and Shrinkage** section.

The recommendations provided herein, and particularly under **Geotechnical Design Recommendations**, **Civil Engineering and Construction Recommendations**, and **Quality Control**, are intended to minimize risks of structural distress related to consolidation or expansion of native soils and/or structural fills. These recommendations, along with proper design and construction of the structure and associated improvements, work together as a system to improve overall performance. If any aspect of this system is ignored or poorly implemented, the performance of the project will suffer. Sufficient quality control should be performed to verify that the recommendations presented in this report are followed.

Structural areas referred to in this report include all areas of bridge abutments, concrete slabs, asphalt pavements, as well as pads for any minor structures. The term engineer, as presented below, pertains to the civil or geotechnical engineer who has prepared the geotechnical engineering report for the project or who serves as a qualified geotechnical professional on behalf of the owner.



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## Discussion and Recommendations

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All compaction requirements presented in this report are relative to CalTrans T216 (Caltrans, 2005). For the purposes of this project:

- Fine-grained soils are defined as those with more than 40 percent by weight passing the number 200 sieve, and a plastic index lower than 15.
- Clay soils are defined as those with more than 30 percent passing the number 200 sieve, and a plastic index greater than 15.
- Granular soils are those not defined by the above criteria.

Any evaluation of the site for the presence of surface or subsurface hazardous substances is beyond the scope of this investigation. When suspected hazardous substances are encountered during routine geotechnical investigations, they are noted in the exploration logs and immediately reported to the client. No such substances were revealed during our exploration.

## Geotechnical Design Recommendations

### Foundation Design Parameters

Based on the anticipated structural loads, shallow spread foundations are the most suitable and economical foundation type to support the abutments of the proposed pedestrian bridge.

The *LRFD* of conventional shallow foundations (AASHTO, 2012; CalTrans, 2008) considers service limit states, strength limit states, and extreme event limit states. Service limit state analysis considers settlement, horizontal movement, and overall stability of the foundation as well as scour at the design flood. Strength limit state analysis considers structural resistance, nominal bearing resistance, overturning or excessive loss of contact, sliding at the base of the footings, and loss of lateral and vertical support due to scour at the design flood event. Extreme event analysis considers scour, vessel and vehicle collision, and seismic loading.

Foundation design parameters for each limit state, described above, are associated with resistance factors, which are specified by the AASHTO for the subject limit state. Since conventional shallow foundation designs are often controlled by settlement, spread footings are typically proportioned at the service limit state and checked for adequate design at the strength and extreme limit states.



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## Discussion and Recommendations

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The factored bearing resistance of footings at the strength limit state is determined by applying a resistance factor to the nominal bearing resistance, which is determined using conventional methods (AASHTO, 2012). In our strength limit state analysis, the nominal bearing resistance values for various footing widths were estimated using the conventional bearing capacity equation (AASHTO, 2012).

Settlement associated with shallow footings can be estimated using conventional methods outlined in the AASHTO (2012) that are applicable for the subsurface units that underlie the footings. In our settlement analysis, settlement associated with the cohesionless soil layers beneath footings was determined using the Schmertman Method (NAVFAC, 1986a). Conventional one-dimensional theory was used to estimate the consolidation settlement of the underlying clay soil layers. Service bearing resistance values were developed to limit the settlement to 1 inch or less in the service limit state analysis. Differential movement between footings with similar loads, dimensions, and base elevations should not exceed two-thirds of the values considered for total movement. Some of the anticipated movement will occur during the construction period as loads are applied.

Shallow foundation design parameters for various footing widths are presented in Table 2 (Abutments Foundations Design Parameters). The factored loads under service, strength, and extreme event limit states should be compared with the recommended bearing Resistance, provided in Table 2, for each limit state for the considered width of the footing. The bearing resistance values, provided in Table 4 (Lateral Earth Pressure Values [Equivalent Fluid Density]), can be linearly interpolated for the footings width between 5 and 10 feet. The factored bearing R-value, provided in Table 4, is associated with a resistance factor of 0.45 for strength limit states. Shallow foundation analysis calculations are contained in Appendix A (Shallow Foundation Analysis Calculations).



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Width of the Footing (feet) <sup>1</sup>	Bearing Resistance (kips per square foot)		
	Nominal <sup>1</sup> (Extreme Event Limit States)	Factored (Strength Limit States)	Service Limit States (1 inch or less Settlement)
	5	13.3	6.0
10	26.5	11.9	6.0

<sup>1</sup> Estimated value using standard bearing capacity factors. Assumed embedment depth of 5 feet below finished grade and ground water depth of 2.5 feet below finished grade near the abutments. A horizontal bench equal to the width of the footing should be provided on the stream side edge of the abutments (before any sloping ground).

The nominal and factored bearing resistance values have been developed assuming that the crest of the abutments fill slopes towards the Gray Eagle Creek will be at a distance equal to the width of the footing from the edge of the abutments foundations. Abutments fill slopes of 2H:1V or flatter will be globally stable (refer to Slope Stability section) in the type of materials present at the site.

The lateral load associated with the abutment foundations can be resisted by base sliding resistance and passive lateral earth resistance associated with the abutment foundations. A nominal coefficient of sliding friction of 0.65 can be used for abutments foundations underlain by compacted granular structural fill or native granular soils (extreme event limit states). A factored coefficient of sliding friction of 0.54 can be used for strength limit states and is associated with a resistance factor of 0.8 (AASHTO, 2012). A nominal equivalent fluid density of 440 pounds per cubic foot (pcf) may be used for passive lateral earth pressure on the side of the abutments foundations, below any scour and frost depth (a minimum 2 feet below adjacent finished grade). This value shall be multiplied by a resistance factor of 0.5 for strength limit states.

The abutments foundations shall be embedded a minimum 2 feet below adjacent finished grade for frost conditions. It is anticipated that the abutments will be founded a minimum of 5 feet below adjacent finished grade. We should review bearing resistance values, provided in Table 3 (Abutments Foundations Seismic Spring Stiffness Values), if the foundations will be embedded less than 5 feet.

In roadway bridges, the seismic structural analysis of the bridge is typically performed by replacing the foundation elements with translational (vertical and horizontal) and rotational spring stiffness values. The spring stiffness values for the abutment



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foundations significantly vary based on the foundation dimensions, and utilize equations that are developed based on an elastic half-space approach (Federal Highway Administration [FHWA], 1998; 2006). Therefore, it is appropriate to develop the spring stiffness values using the selected foundation dimensional requirements. For the seismic design parameters for this site, as presented in Table 1, we recommend that the native subsurface soils profile, consisting of saturated very dense gravels or very hard clays, be modeled as a uniform elastic medium with an approximate shear modulus of 4,200 pounds per cubic inch (pci) and a Poisson ratio of 0.5. The spring stiffness values for a considered minimum abutment foundation dimensions are summarized below in Table 3. All the stiffness values, presented in Table 3, will increase with increases in foundation width, foundation length, foundation thickness, and/or embedment depth.

**TABLE 3 – ABUTMENTS FOUNDATIONS SEISMIC SPRING STIFFNESS VALUES**

Design Parameters		Values
Assumed Minimum Abutment Shallow Foundation Dimensions	Length (feet)	5
	Width (feet)	10
	Thickness (feet)	2
	Embedment Depth (feet)	5
Abutments Foundations Spring Stiffness Values For Various Modes <sup>1,2</sup>	Vertical Translation (kips per inch)	3.532
	Horizontal Translation in Longitudinal Direction (kips per inch)	2,613
	Horizontal Translation in Transverse Direction (kips per inch)	2,382
	Rotational About Longitudinal Axis (kip-inch per radians)	$4.02 \times 10^6$
	Rotational About Transverse Axis (kip-inch per radians)	$8.74 \times 10^6$

<sup>1</sup> Values estimated using elastic half-space approach (FHWA, 1998; 2006).

<sup>2</sup> Longitudinal direction is perpendicular to foundation alignment (parallel to bridge deck) and transverse direction is parallel to foundation alignment (perpendicular to bridge deck).



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### Abutment Wing and Back Wall Design Parameters

Design of conventional cantilever retaining walls using *LRFD* criteria (Caltrans, 2008; AASHTO, 2012) considers service limit states, strength limit states, and extreme event states. Service limit state analysis considers vertical and lateral displacement, as well as overall stability. Strength limit state analysis considers bearing resistance failure, lateral sliding, overturning, excessive loss of base contact, and structural failure. Extreme event analysis considers scour, vessel and vehicle collision, and seismic loading.

The bearing resistance provided and vertical wall movement (settlement) of retaining wall footings should follow the discussion included in the **Foundation Design Parameters** section.

Lateral wall movement at the service limit state is evaluated using active, passive, and at-rest lateral earth pressures developed using conventional methods (AASHTO, 2012), while the overall stability is analyzed using limit-equilibrium methods of analysis. Pseudo-static methods for seismic analysis can incorporate the Mononobe and Okabe (FHWA, 1998) approach. Active and passive lateral earth pressure values for static loading conditions were estimated using the Coulomb equation and charts by the NAVFAC (1986a). Active lateral earth pressure values for seismic analysis were estimated using the Mononobe and Okabe equation and a horizontal acceleration coefficient equal to one-half the seismic acceleration coefficient at zero period for the site (0.427).

Lateral earth pressure values for static and pseudo-static conditions of retaining walls not directly connected to the abutment structures are presented in Table 4. The passive lateral earth pressure values from Table 4 are factored and were developed by applying a resistance factor for estimated nominal lateral earth pressure values (CalTrans, 2008; AASHTO 2012). Appropriate load factors shall be applied to the active and at-rest lateral earth pressure values for various limit state design cases.



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**TABLE 4 – LATERAL EARTH PRESSURE VALUES (EQUIVALENT FLUID DESNITY), pcf**

Retained Slope	Static		Dynamic	
	Active <sup>1</sup>	Passive <sup>2</sup>	Active <sup>1</sup>	Passive <sup>3</sup>
Level	28	220	44	440

<sup>1</sup>For walls that are free to yield at least 0.2 percent of the wall height.

<sup>2</sup>Factored passive lateral earth R-value by applying a resistance factor of 0.5 to the nominal passive lateral earth resistance.

<sup>3</sup>Nominal lateral R-value for static loading condition is used.

Restrained walls should be designed to resist an at-rest equivalent fluid density of 48 pcf.

Lateral loads will be resisted by friction along the base of retaining wall footings and by passive resistance against buried foundation walls. Wall footings directly on native gravel soils, or on properly compacted structure fill, may be designed using a factored coefficient of sliding friction of 0.54; the factored coefficient of sliding friction was developed by applying a resistance factor of 0.8 to the nominal coefficient of sliding friction where wall footings will be underlain by native coarse-grained soil or compacted structural fill.

The passive resistance from the soils behind the abutment wing and back walls will also contribute towards translational spring stiffness values. In the longitudinal direction (parallel to bridge deck), the additional horizontal translational spring stiffness in kips per inch is equal to  $3.6 \times w^4 \times h$ , where  $w$  is the width/thickness of the back wall and  $h$  is the height of the back wall (CalTrans, 2013b). It shall be noted that this value should only be applied to one of the abutment back walls. Further, a seismic horizontal deflection greater than the gap between the bridge deck and the abutments back wall is necessary to trigger the above provided additional longitudinal translational spring stiffness. The additional spring stiffness values associated with the wing walls will be equal to the resultant passive resistance force divided by 2 percent of the average height of the wing walls (a horizontal deflection necessary to fully develop passive resistance).



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### Retaining Wall Drainage Design

Abutments and retaining wall drainage shall be accomplished by installing Class 1 or Class 2 permeable material (CalTrans, 2010) or a prefabricated drain system, and a weep hole drain system at the bottom of the wall. The drain rock section shall be a minimum of 18 inches wide and extend to within 12 inches of finish grade. A filter fabric (CalTrans, 2010) shall be placed between the permeable material and the native soils to prevent migrations of fines into the permeable material.

A prefabricated drain system consists of a three-dimensional mesh or waffle structure with a geotextile on one side, such as Mirafi® *Miradrain G100N*, that is fastened to the back side of the wall with the geotextile side facing the backfill. The prefabricated drain mat connects at the bottom of the wall and empties into the permeable backfill layer, which drains through the weep holes. With a prefabricated drain system, backfill can be any soil material except clay.

### Portland Cement Concrete Mix Design Parameters

Soluble sulfate content has been determined for representative samples of the site foundation soils. The sulfate was extracted from the soil at a 10:1 water to soil ratio in order to assure that all soluble sodium sulfate was dissolved. The results are reported in milligrams of sulfate per kilogram of soil and can be directly converted to percent by dividing by 10,000. The percent sulfate in the soil is used to determine the sulfate exposure Class (S) from the information presented in Table 5 (Sulfate Exposure Class).



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TABLE 5 – SULFATE EXPOSURE CLASS*				
<b>S</b> Sulfate			<b>Water-Soluble Sulfate (SO<sub>4</sub>) in Soil, Percent by Weight</b>	
	Not Applicable	SO	SO <sub>4</sub> < 0.10	SO <sub>4</sub> < 150
	Moderate	S1	0.10 ≤ SO <sub>4</sub> < 0.20	150 ≤ SO <sub>4</sub> < 1,500 Seawater
	Severe	S2	0.20 ≤ SO <sub>4</sub> ≤ 2.00	1,500 ≤ SO <sub>4</sub> ≤ 10,000
	Very Severe	S3	SO <sub>4</sub> > 2.00	SO <sub>4</sub> > 10,000

\*From Table 4.2.1 Exposure Categories and Classes. ACI 318, *Buildings Code and Comments* (American Concrete Institute [ACI], 2008).

The results of the testing (Appendix B) indicate that concrete in contact with the site foundation soils should be designed for Class SO Sulfate exposure. Therefore, Type 2 cement can be used for all concrete work.

Concrete mix designs for this project shall incorporate a maximum water to cement ratio of 0.50.

### Asphalt Concrete Pavement Design

Approach areas paved as part of the pathway leading to the pedestrian bridge shall consist of 3 inches of asphalt concrete underlain by 6 inches of Class 1, 3/4-inch aggregate base (CalTrans, 2010). The pavement surface shall be graded such that it prevents ponding of water along its surface. The aggregate base or landscaped fill located adjacent to the edge of pavement shall also be graded such that it promotes drainage away from the improvements, preventing subgrade saturation.

### Slope Stability

Stability of cut and filled surfaces involves two separate aspects. The first concerns true slope stability related to mass wasting, landslides, or the en masse downward movement of soil or rock. Stability of cut and fill slopes is dependent upon shear strength, unit weight, moisture content, and slope angle.

Foundation design has been conducted with the assumption that a level surface extends horizontally a minimum distance of one footing width from the front of the



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abutment structures to the crest of the slope, such that loading from the abutment structures does not negatively affect global stability of the creek banks.

The exploration and testing program conducted during this investigation confirms 2H:1V slopes will be stable. The second aspect relates to erosional stability and is discussed in the Slope Stability and Erosion Control section.

## Civil Engineering and Construction Recommendations

Construction of the pedestrian bridge and any associated improvements shall be performed in accordance with the CalTrans *Bridge Design Specifications* (2008) and CalTrans *Standard Specifications* (CalTrans, 2010).

### Site Preparation

All vegetation shall be stripped and grubbed from structural areas and removed from the site. A stripping depth of 0.2 to 0.3 feet is anticipated. Trees and associated roots greater than one-half inch in diameter shall be removed, where necessary, to a minimum depth of 12 inches below finished grade. Large roots (greater than 6 inches in diameter) shall be removed to the maximum depth possible. Resulting excavations shall be backfilled with structural fill compacted to 90 percent relative compaction.

A test pit was excavated by a backhoe at the approximate location shown on the site plan. The location was determined in the field by approximate means. The test pit was backfilled upon completion of the field portion of our study. The backfill was compacted to the extent possible with equipment on hand. However, the backfill was not compacted to the requirements presented herein under **Mass Grading**. If structures, concrete flatwork, pavement, utilities or other improvements are to be located in the vicinity of the test pit, the backfill should be removed and recompacted in accordance with the requirements contained below. Failure to properly compact backfill could result in excessive settlement of improvements located over test pits.

Clay and fine-grained soils were found to exist beneath the gravel-rich soils (10 to 15 feet below U.S. Highway 89) through the maximum depth explored (36.5 feet). These soils were classified as wet, very hard, and as exhibiting low to medium plasticity. Laboratory testing performed on these materials indicates that the clay soils exhibit plasticity indices on the order of 19 to 25, indicative of low to moderately



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expansive soils when subjected to changes in in-situ moisture content (Nelson and Miller, 1992).

Based on information provided by Bastian Engineering, abutment footings will bear approximately 12 feet below the base of the creek and associated low water level. At this depth, the footing excavations should completely penetrate the layers of clay and fine-grain soils encountered during exploration at this site. If, however, clay and/or fine-grained soils are exposed in the base of the abutment footing excavations, they will need to be over-excavated a minimum of 2 feet and backfilled with structural fill to footing grade. The limits of any over-excavation shall extend beyond the footing limits a minimum of 5 feet.

All areas to receive structural fill or structural loading shall be densified to, at least, 90 percent relative compaction. The majority of the granular soils at the site contain less than 70 percent passing the 3/4-inch sieve and are too coarse for standard density testing techniques. In this case, proof rolling by a minimum 5 single passes with an excavator-mounted sheep's-foot compactor or a minimum 10-ton roller shall be performed. This alternate has proved to provide adequate project performance as long as all other geotechnical recommendations are closely followed. In all cases, the final surface shall be smooth, firm, and exhibit no signs of deflection.

Excavations for the abutment will encounter ground water that will require dewatering. Dewatering will require appropriate state and local permits for ground water pumping and discharge. In particular, all dewatering shall be performed in accordance with Plumas County, CalTrans, and California Regional Water Quality Control Board (CRWQB) requirements.

Once the excavation has been dewatered, surface soils may be well above optimum moisture and impossible to compact. In some situations, moisture conditioning may be possible by scarifying the top 12 inches of subgrade and allowing it to air dry to near-optimum moisture, prior to compaction. Where this procedure is ineffective or where construction schedules preclude delays, mechanical stabilization will be necessary. Mechanical stabilization may be achieved by over-excavation and/or placement of an initial 12 to 18-inch-thick lift of 12-inch-minus to 3-inch-plus, well-graded, angular rock fill. The more angular and well-graded the rock is, the more effective it will be. This fill shall be densified with large equipment, such as an excavator mounted sheep's-foot or a large loader, until no further deflection is noted. Additional lifts of rock may be necessary to achieve adequate stability. The use of a filter fabric will prevent mud from pumping up between the rocks, thereby increasing



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rock-to-rock contact and decreasing the required thickness of stabilizing fill. The filter fabric shall meet or exceed the CalTrans *Standard Specifications* for filter fabric (CalTrans, 2010).

As an alternate to rock fill, a geotextile/gravel system may be used for stabilization. Class 2, 3/4-inch aggregate base (CalTrans, 2010), Class 1, Type A or B, or Class 2 permeable material (Caltrans, 2010), or pit run gravels shall be placed above the geotextile. Regardless of which alternate is selected, a test section is recommended to determine the required thickness of stabilization.

If loose, soft, wet, or disturbed soils are encountered at the foundation subgrade; these soils shall be removed to expose undisturbed coarse-grained soils and the resulting over-excavation backfilled with compacted structural fill. The base of all excavations shall be dry and free of loose soils at the time of concrete placement.

### Trenching and Excavation

Abundant cobbles and large boulders within the subsurface coarse-grained river deposits are common within the Gray Eagle Creek channel. Such materials will make trenching, excavating, and finished grading extremely difficult.

The existing granular materials will tend to slough and cave when exposed in excavations or trenches when exposed and unsupported for prolonged periods of time. Sloughing could occur as quickly as the exposed surface begins to dry out. Therefore, temporary construction slopes will need to be flatter than for cohesive soils in order minimize this potential.

Temporary trenches with near-vertical sidewalls should be stable to a depth of approximately 4 feet. Temporary trenches are defined as those that will be open for less than 24 hours. Excavations to greater depths will require shoring or laying back of sidewalls to maintain adequate stability. Regulations contained in Part 1926, Subpart P, of Title 29 of the Code of Federal Regulations (CFR, 2010) require that temporary sidewall slopes be no greater than those presented in Table 6 (Maximum Allowable Temporary Slopes).



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TABLE 6 – MAXIMUM ALLOWABLE TEMPORARY SLOPES	
Soil or Rock Type	Maximum Allowable Slopes <sup>1</sup> for Deep Excavations less than 20 Feet Deep <sup>2</sup>
Stable Rock	Vertical (90 degrees)
Type A <sup>3</sup>	3H:4V (53 degrees)
Type B	1H:1V (45 degrees)
Type C	3H:2V (34 degrees)

*Notes:*

1. Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
2. Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.
3. A short-term (open 24 hours or less) maximum allowable slope of 1H:2V (63 degrees) is allowed in excavation in Type A soils that are 12 feet or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet in depth shall be 3H:4V (53 degrees).

The State of California, Department of Industrial Relations, Division of Occupational Safety and Health Administration (CalOSHA), has adopted and strictly enforces these regulations, including the classification system and the maximum slopes. In general, Type A soils are cohesive, non-fissured soils, with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater. Type B are cohesive soils with an unconfined compressive strength between 0.5 and 1.5 tsf. Type C soils have an unconfined compressive strength below 0.5 tsf. Numerous additional factors and exclusions are included in the formal definitions. The client, owner, design engineer, and contractor shall refer to Appendix A and B of Subpart P of the, previously referenced, Federal Register for complete definitions and requirements on sloping and benching of trench sidewalls. Appendices C through F of Subpart P apply to requirements and methodologies for shoring.

On the basis of our exploration, the native site soils are predominately Type C. Any area in question shall be considered Type C, unless specifically examined by the engineer during construction. All trenching shall be performed and stabilized in accordance with local, state, and CalOSHA standards.

### Mass Grading

A grading plan for the project was unavailable at the time of this report. Based on the site topography and the conceptual bridge alignment, minor cutting and filling will be



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required within the abutment approaches to create a smooth transition to the pedestrian bridge from the walking paths along U.S. Highway 89.

Native clay and fine-grained soils present at depth are not considered suitable for use as structural fill. Native granular soils will be suitable for structural fill provided particles larger than 4 inches are removed. Oversized rock can be stockpiled for later use as erosion protection. If imported structural fill is required on this project, we recommend it satisfy the specifications presented in Table 7 (Guideline Specifications for Imported Structural Fill).

**TABLE 7 – GUIDELINE SPECIFICATIONS FOR IMPORTED STRUCTURAL FILL**

Sieve Size	Percent by Weight Passing	
4-Inch	100	
3/4-Inch	70 – 100	
No. 40	15 – 70	
No. 200	5 – 30	
Percent Passing No. 200 Sieve	Maximum Liquid Limit	Maximum Plastic Index
5 – 10	50	20
11 – 20	40	15
21 – 30	35	10

These recommendations are intended as guidelines to specify a readily available, prequalified material. Adjustments to the recommended limits can be provided to allow the use of other granular, non-expansive material. Any such adjustments must be made and approved by the engineer, in writing, prior to importing fill to the site.

All fill placed on hillsides steeper than 5H:1V shall be keyed into existing materials in equipment wide benches.

Any structural fill within the abutment area shall be placed in maximum 8-inch-thick (loose) lifts, each densified to, at least, 95 percent relative compaction. All other structural fill shall be densified to a minimum 90 percent relative compaction. Nonstructural fill shall be densified to, at least, 85 percent relative compaction to minimize consolidation and erosion.



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Commonly, the site materials will have greater than 30 percent retained on the 3/4-inch sieve such that standard density testing is not valid. These materials will be treated as rock fills with a maximum lift thickness and maximum particle size of 12 and 8 inches, respectively. A proof rolling program of at least five single passes of a minimum CAT® 815 roller in mass grading or at least five complete passes with an excavator-mounted sheep's foot compactor in abutment excavations is recommended. Acceptance of this rock fill is based upon observation of particle size, lift thickness, moisture content, and applied compactive effort. Compaction must continue to the satisfaction of the engineer. In all cases, the finished surface shall be firm and show no signs of deflection.

Grading shall not be performed with or on frozen soils.

### Utility Trench Backfill

The pedestrian bridge will also include a carrier pipe that will house water and sewer main lines. Construction of this carrier line will most likely require approach trenches. The maximum particle size in trench backfill shall be 4 inches. Bedding and initial backfill 12 inches over the pipe will require import and shall conform to the requirements of the utility having jurisdiction. Bedding and initial backfill shall be densified to, at least, 90 percent relative compaction. Native granular soil will provide adequate final backfill as long as oversized particles are excluded, and shall be placed in maximum 8-inch-thick loose lifts that are compacted to a minimum of 90 percent relative compaction in all structural areas.

Excavations below the ground water table will likely require dewatering. Below the waterline, bedding and backfill shall consist of compacted permeable material (Caltrans, 2010) graded in accordance with the requirements for Class 1, Type A or B, or Class 2 permeable backfill. When permeable material is used as trench backfill, it shall be considered a rock backfill (greater than 30 percent retained on the 3/4-inch sieve) and shall be placed in maximum 12-inch-thick loose lifts, with each lift densified by at least 5 complete passes with approved compaction equipment and until no deflection is observed. A filter fabric (CalTrans, 2010) shall be placed between the permeable material and any native soil backfill.

### Retaining Wall Backfill

Backfill behind retaining walls shall be compacted to 90 percent of the material's maximum dry density, but shall not be densified to more than about 92 percent maximum dry density to minimize pressure against the wall. Care must be exercised



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when compacting backfill against retaining walls and foundations. To reduce temporary construction loads on the walls, heavy equipment shall not be used for placing and compacting fill within a region as determined by a 0.5H:1V line drawn upward from the bottom of the wall, or within 3 feet of the wall, whichever is greater. We recommend that hand-operated compaction equipment be used to compact soils adjacent to walls.

### Subsidence and Shrinkage

Subsidence of granular alluvial soils exposed in cut should be negligible. Granular alluvial soils excavated and recompacted in structural fills should experience quantity shrinkage of approximately 10 to 40 percent, and will be highly variable due to the quantity of oversized particles.

### Slope Stability and Erosion Control

As noted previously in the Slope Stability section, there are two aspects to slope stability. The first relates to overall global stability of the slope with respect to mass failure. The second aspect of stability involves erosion potential and is dependent on numerous factors involving grain size distribution, cohesion, moisture content, slope angle, and the velocity of the water or wind on the ground surface. Erosion control of cut and fill slopes 5H:1V or steeper is necessary. Slopes between 3H:1V and 5H:1V can typically be stabilized by hydroseeding. Slopes steeper than 3H:1V require mechanical stabilization. Erosion protection shall also be required to minimize scour potential in the slope areas adjacent to abutment footings.

In order to minimize erosion and downstream impacts to sedimentation from this site, best management practices with respect to storm water discharge shall be implemented at this site during construction.

### Site Drainage

Adequate surface drainage shall be provided so moisture is directed away from the structure and pavement. The ponding of water on finish grade or at the edge of pavements shall be prevented by proper grading.

### Asphalt Concrete

All asphalt pavement shall be directly underlain by imported Class 2, 3/4-inch aggregate base (Caltrans, 2010). All aggregate base beneath asphalt pavements shall be densified to, at least, 95 percent relative compaction. Aggregate leveling courses



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will be too thin for proper density testing, but shall be compacted by a minimum 5 passes with a minimum 10-ton drum roller.



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## Anticipated Construction Problems

Depending on the season of construction, soft, wet, surface soils may make it difficult for construction equipment to travel and operate. Excavation for abutments will encounter ground water that will require dewatering. Some difficulty will also be encountered in trenching due to the presence of small to large boulders in areas of river deposit soils.



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## Quality Control

All plans and specifications should be reviewed for conformance with this geotechnical report and approved by the engineer prior to submitting them to the building department for review.

The recommendations presented in this report are based on the assumption that sufficient field testing and construction review will be provided during all phases of construction. We should review the final plans and specifications to check for conformance with the intent of our recommendations. Prior to construction, a pre-job conference should be scheduled to include, but not be limited to, the owner, civil engineer, the general contractor, and engineer. The conference will allow parties to review the project plans, specifications, and recommendations presented in this report and discuss applicable material quality and mix design requirements. All quality control reports should be submitted to and reviewed by the engineer.

During construction, we should have the opportunity to provide sufficient on-site observation of preparation and grading, over-excavation, fill placement, foundation installation, and paving. These observations would allow us to verify that the geotechnical conditions are as anticipated and that the contractor's work is in conformance with the approved plans and specifications.



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## Standard Limitations Clause

This report has been prepared in accordance with generally accepted geotechnical practices. The analyses and recommendations submitted are based on field exploration performed at the locations shown on Plate 1 of this report. This report does not reflect soils variations that may become evident during the construction period, at which time re-evaluation of the recommendations may be necessary. We recommend our firm be retained to perform construction observation in all phases of the project related to geotechnical factors to ensure compliance with our recommendations. The owner shall be responsible for distributing this geotechnical investigation to all designers and contractors whose work is related to geotechnical factors.

Equilibrium water level readings were made on the date shown on Plate 2 of this report. Fluctuations in the water table may occur due to rainfall, temperature, seasonal runoff or adjacent irrigation practices. Construction planning should be based on assumptions of possible variations in the water table.

This report has been produced to provide information allowing the architect or engineer to design the project. The owner is responsible for distributing this report to all designers and contractors whose work is affected by geotechnical aspects. In the event there are changes in the design, location, or ownership of the project from the time this report is issued, recommendations should be reviewed and possibly modified by the engineer. If the engineer is not granted the opportunity to make this recommended review, he or she can assume no responsibility for misinterpretation or misapplication of his or her recommendations or their validity in the event changes have been made in the original design concept without his or her prior review. The engineer makes no other warranties, either expressed or implied, as to the professional advice provided under the terms of this agreement and included in this report.



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## References

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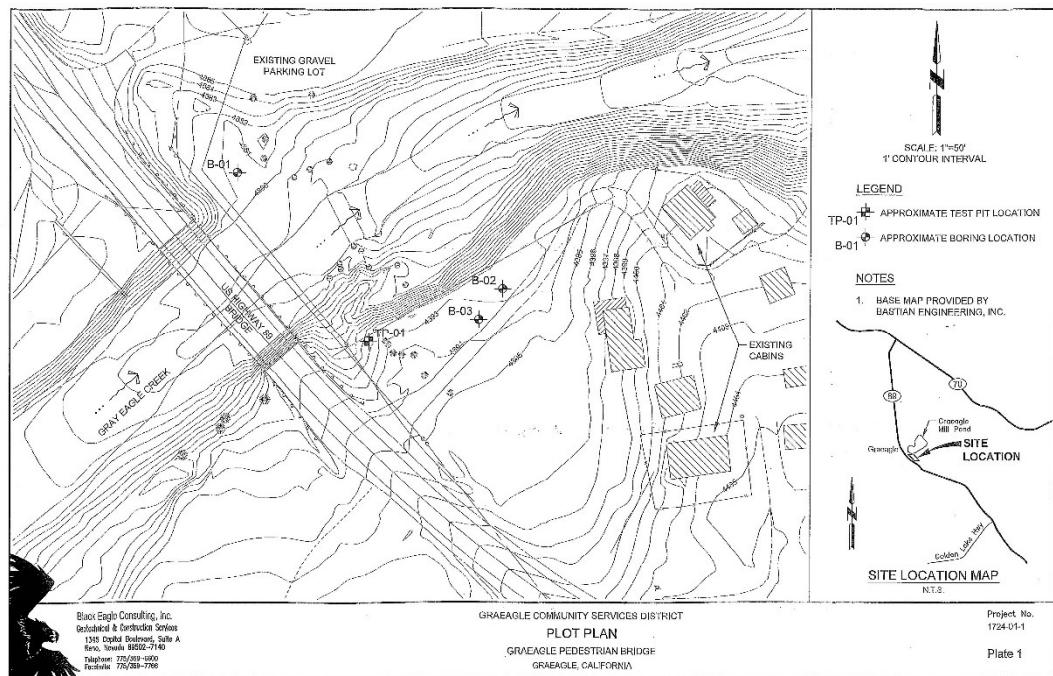


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# PLATES



BORING LOG							
BORING NO.: B-01				DATE: 1/9/2014			
TYPE OF RIG: CME 55				DEPTH TO GROUND WATER (ft): 2.5			
LOGGED BY: MW				GROUND ELEVATION (ft): 4380			
SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY
Bulk	GRAB				2	SM	
A	SPT	31			4	GP-GM	
B	SPT	82 (11)	12.7	NP	6	GW	
C	SPT	50 (3.5)			8	SC	
D	SPT	47			10	ML	
E	SPT	49	22.0	19	12	SM	
F	SPT	57			14	SC	
G	SPT	50 (4)			16	SM	
H	SPT	50 (4)			18	SC	
					20	SC-SC	
					22	SC-SC	
N 4404417 E 704079 UTM NAD83							
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				<p>PROJECT NO.: 1724-01-1 PLATE: 2 SHEET 1 OF 2</p>			

BORING LOG 1724011 GPJ BLACKEAGLE.GDT 2/7/2014

BORING LOG								
BORING NO.: B-01				DATE: 1/9/2014				
TYPE OF RIG: CME 55				DEPTH TO GROUND WATER (ft): 2.5				
LOGGED BY: MW				GROUND ELEVATION (ft): 4380				
SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
					24	CH		Sandy Fat Clay Gray, wet, very hard, with an estimated 80% medium to high plasticity fines, and 20% fine to medium sand. This layer smells of decomposing organics.
I	SPT	91 (11)			26			Sandy Lean Clay Gray, wet, very hard, with an estimated 80% low to medium plasticity fines, and 20% fine to medium sand. This layer smells of decomposing organics.
J	SPT	90 (10)			28	CL		Sandy Lean Clay Dark brown, wet, very hard, with an estimated 80% low plasticity fines, and 20% fine to medium sand.
K	SPT	62			30	CL		
					32			
					34	CL		
					36			
					38			
					40			
					42			
					44			
N 4404417 E 704079 UTM NAD83								
 <p>Black Eagle Consulting, Inc. 1345 Capital Blvd., Suite A Reno, Nevada 89502-7140 (775) 359-6600</p>				<p><b>Graeagle Community Services District</b> <b>Graeagle Pedestrian Bridge</b> <b>Graeagle, California</b></p>			PROJECT NO.:	1724-01-1
							PLATE:	2
SHEET 2 OF 2								

BORING LOG 1724-01-1.GPJ BKEAGLE.GDT 1/28/2014

BORING LOG								
BORING NO.: B-02					DATE: 1/13/2014			
TYPE OF RIG: CME 55					DEPTH TO GROUND WATER (ft): NE			
LOGGED BY: MW					GROUND ELEVATION (ft): 4393			
SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
A	SPT	37			2	SC-SCM		Silty, Clayey Sand with Gravel Brown, moist, dense, with an estimated 25% non-plastic to low plasticity fines, 45% fine to coarse sand, and 30% angular gravel up to 1.25 inches in diameter.
Bulk	AUGER				4	SC		Clayey Sand with Gravel Brown to dark brown, moist, dense, with an estimated 30% medium plasticity fines, 40% fine to coarse sand, and 30% rounded to subangular gravel up to 3 inches in diameter.
B	SPT	57			6	SC-SCM		Silty, Clayey Sand with Gravel Brown, moist, very dense, with an estimated 25% non-plastic to low plasticity fines, 40% fine to coarse sand, and 35% angular gravel up to 1.25 inches in diameter. Sampled to a depth of 6.5 feet with drilling refusal occurring at 5.5 feet due to a boulder.
					8			
					10			
					12			
					14			
					16			
					18			
					20			
					22			
N 4404395 E 704148 UTM NAD83								
 Black Eagle Consulting, Inc. 1345 Capital Blvd., Suite A Reno, Nevada 89502-7140 (775) 359-6600					<b>Graeagle Community Services District</b> <b>Graeagle Pedestrian Bridge</b> <b>Graeagle, California</b>			PROJECT NO.: 1724-01-1
								PLATE: 2
SHEET 1 OF 1								

BORING LOG 172401-1.GRL BKEAGLE.GOT 1/28/2014

BORING LOG								
BORING NO.: B-03				DATE: 1/13/2014				
TYPE OF RIG: CME 55				DEPTH TO GROUND WATER (ft): NE				
LOGGED BY: MW				GROUND ELEVATION (ft): 4393				
SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
A	X SPT	77 (11.5)			2	SM		Silty Sand Tan to brown, slightly moist, very dense, with an estimated 15% non-plastic fines, 75% fine to coarse sand, and 10% rounded to subangular gravel up to 0.5 inches in diameter.
B	X SPT	20 (6)		SP-SM	4			Poorly Graded Sand with Silt and Gravel Brown, very moist, very dense, with an estimated 10% non-plastic fines, 70% fine to coarse sand, and 20% rounded to angular gravel up to 1.25 inches in diameter. Drilling and sample refusal at 5.5 feet below the existing ground surface due to sampler bouncing twenty times on a boulder.
					6			
					8			
					10			
					12			
					14			
					16			
					18			
					20			
					22			

N 4404385 E 704140 UTM NAD83

BORING LOG 172401.GPJ BUEAGLE GDT 1/29/2014

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--	--	--

TEST PIT LOG								
TEST PIT NO.: TP-01				DATE: 1/15/2014				
TYPE OF HOE: Cat 426 B				DEPTH TO GROUND WATER (ft): 8				
LOGGED BY: MW				GROUND ELEVATION (ft): 4390				
SAMPLE NO.	SAMPLE TYPE	PENETROMETER (tsf)	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
A	GRAB		12.9	11		GP-GC		<b>Poorly Graded Gravel with Clay and Sand</b> Dark brown, moist to wet, dense, with 6% low plasticity fines, 44% fine to coarse sand, and 50% rounded gravel up to 3 inches in diameter. This layer contains roots up to 3 inches in diameter to a depth of 8.5 feet. This layer also includes cobbles and boulders up to 2.5 feet in diameter accounting for 60% of the tsm (with the majority between 8-12 inches in diameter). Bulk sample.
B	GRAB					GW		
C	GRAB		40.0	25		CL		<b>Well-Graded Gravel with Sand</b> Gray to brown, wet, dense, with an estimated 10% non-plastic fines, 20% fine to coarse sand, and 70% subangular to rounded gravel up to 3 inches in diameter. This layer contains cobbles up to 12 inches in diameter that account for 40% of the tsm (with the majority of oversized particles were between 3-6 inches in diameter).
D	GRAB					SM		<b>Sandy Lean Clay</b> Gray, wet, very stiff to hard, with 69% medium plasticity fines, 27% fine to coarse sand, and 4% subangular gravel up to 0.5 inches in diameter. Pocket penetrometer reading of 4.5 tons per square foot (tsf). <b>Silty Sand with Gravel</b> Dark gray, wet, hard, with 20% low plasticity fines, 65% fine to coarse sand, and 15% subangular gravel up to three-eighths of an inch in diameter. Pocket penetrometer reading of 4.5 tsf
N 4404387 E 704113 UTM NAD83								
 Black Eagle Consulting, Inc. 1345 Capital Blvd., Suite A Reno, Nevada 89502-7140 (775) 359-6600				<b>Graeagle Community Services District</b> <b>Graeagle Pedestrian Bridge</b> <b>Graeagle, California</b>				
				PROJECT NO.: 1724-01-1 PLATE: 2 SHEET 1 OF 1				

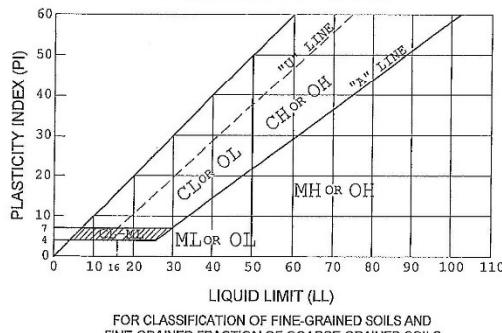
BORING LOG 172401-GRJ BLKEAGLE.GDT 2/6/2014

### SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS  MORE THAN 50% OF COARSE FRACTION REMAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GM SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
		CLEAN SANDS (LITTLE OR NO FINES)		GC CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SW WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	SAND AND SANDY SOILS  MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE			SP POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		CLEAN SANDS (LITTLE OR NO FINES)		SM SILTY SANDS, SAND-SILT MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SC CLAYEY SANDS, SAND-CLAY MIXTURES
				ML INORGANIC SILTS AND VERY FINE SANDS, ROCK FLUSS, SILT OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL INORGANIC CLAYS OF LOW TO HIGH PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
FINE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS  LIQUID LIMIT LESS THAN 50			OL ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
				MH INORGANIC SILTS, MICAEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH INORGANIC CLAYS OF HIGH PLASTICITY
				OH ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
		HIGHLY ORGANIC SOILS		PT PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
	SILTS AND CLAYS  LIQUID LIMIT GREATER THAN 50			PT PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
		FILL MATERIAL		--- FILL MATERIAL, NON-NATIVE
				---
				---
				---

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

### PLASTICITY CHART



USCS CHART 1724-01-1 GPJ US LAB GDT 12/20/2014

### EXPLORATION SAMPLE TERMINOLOGY

Sample Type	Sample Symbol	Sample Code
Auger Cuttings		Auger
Bulk (Grab) Sample		Grab
Modified California Sampler		MC
Shelby Tube		SH or ST
Standard Penetration Test		SPT
Split Spoon		SS
No Sample		

### GRAIN SIZE TERMINOLOGY

Component of Sample	Size Range
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 2mm)
Sand	#4 to #200 sieve (2mm to 0.074mm)
Silt or Clay	Passing #200 sieve (0.074mm)

### RELATIVE DENSITY OF GRANULAR SOILS

N - Blows/ft	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
greater than 50	Very Dense

### CONSISTENCY OF COHESIVE SOILS

Unconfined Compressive Strength, psf	N - Blows/ft	Consistency
less than 500	0 - 1	Very Soft
500 - 1,000	2 - 4	Soft
1,000 - 2,000	5 - 8	Firm
2,000 - 4,000	9 - 15	Stiff
4,000 - 8,000	16 - 30	Very Stiff
8,000 - 16,000	31 - 60	Hard
greater than 16,000	greater than 60	Very Hard

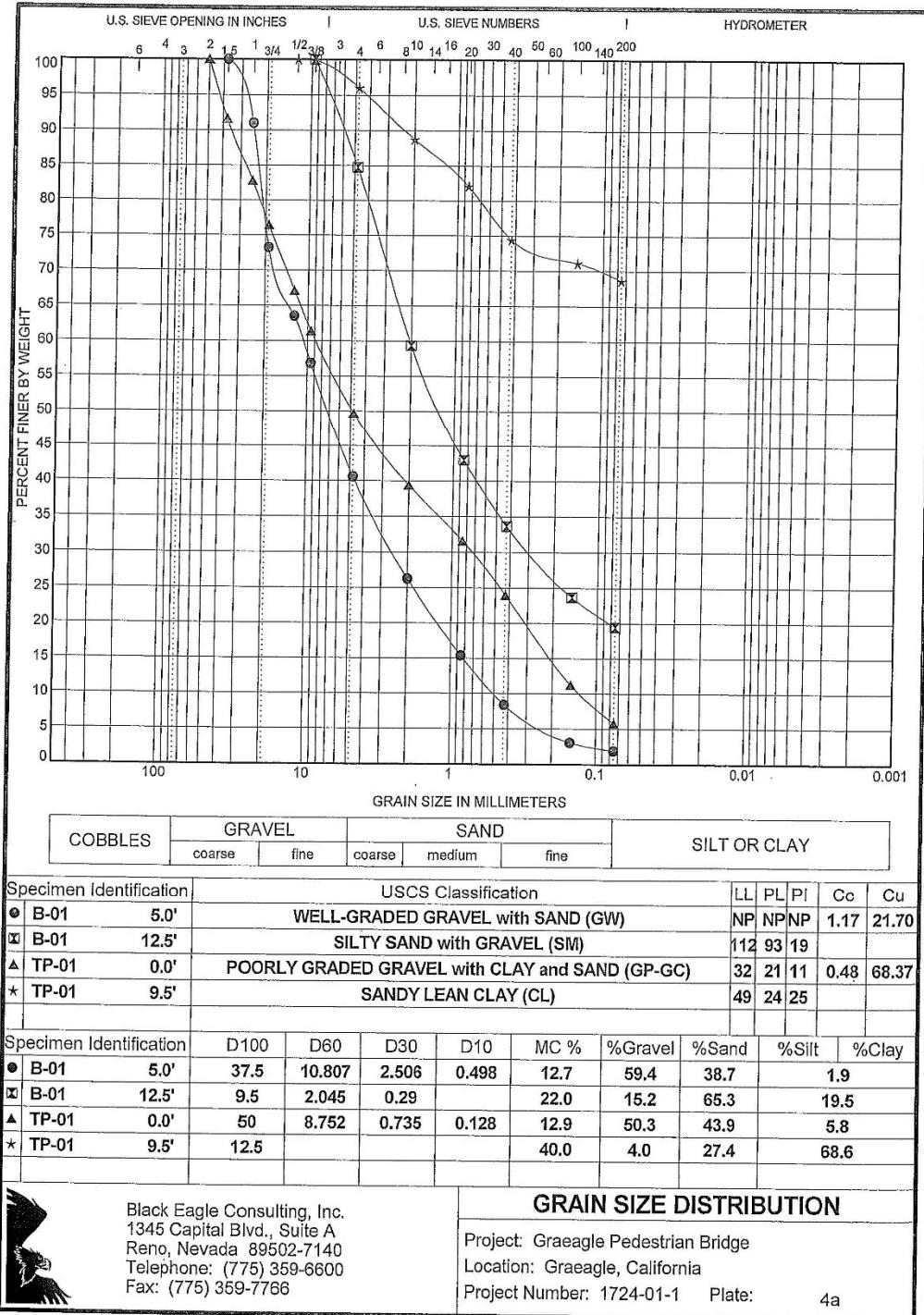


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### USCS Soil Classification Chart

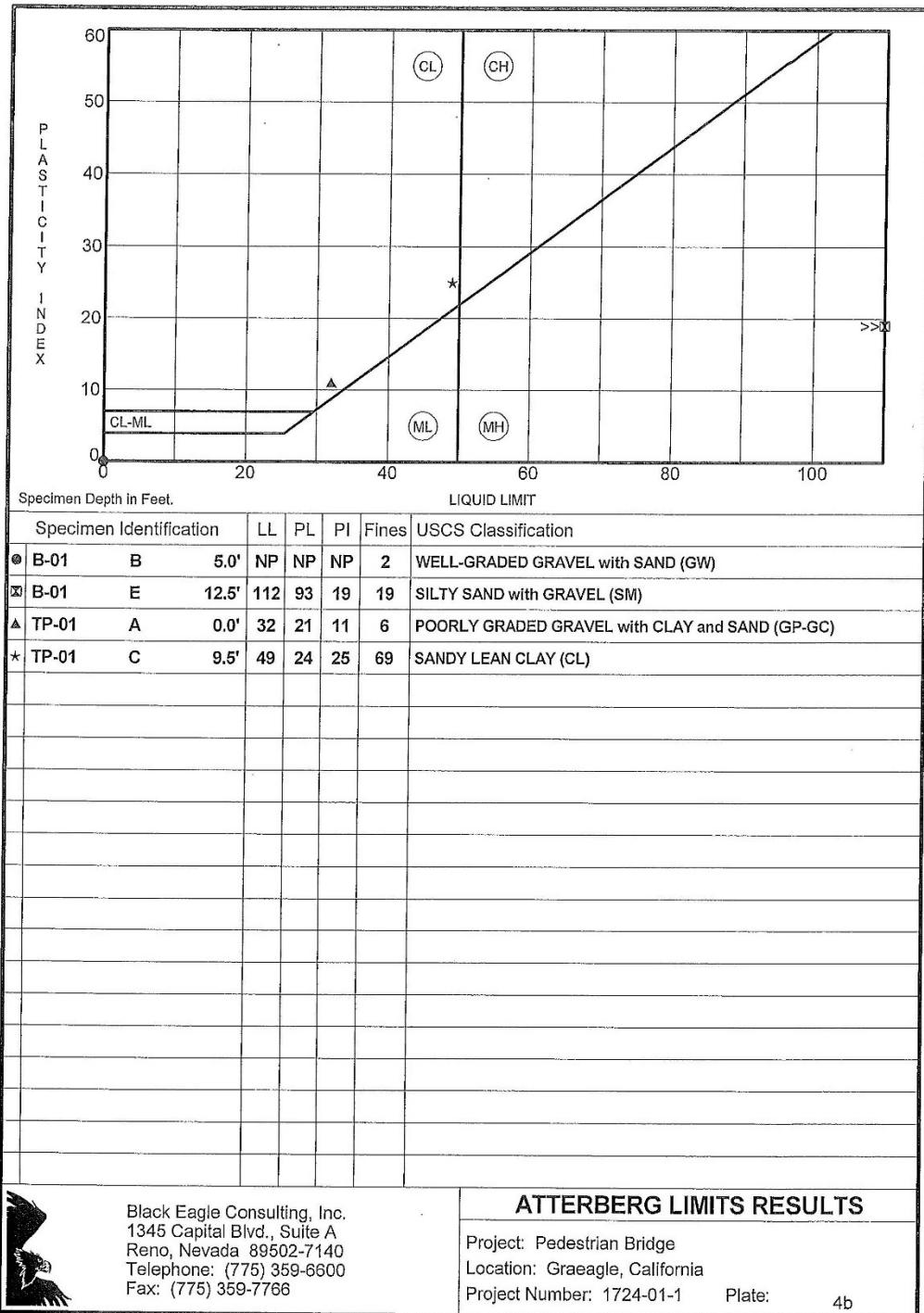
Project: Graeagle Pedestrian Bridge  
Location: Graeagle, California  
Project Number: 1724-01-1 Plate:

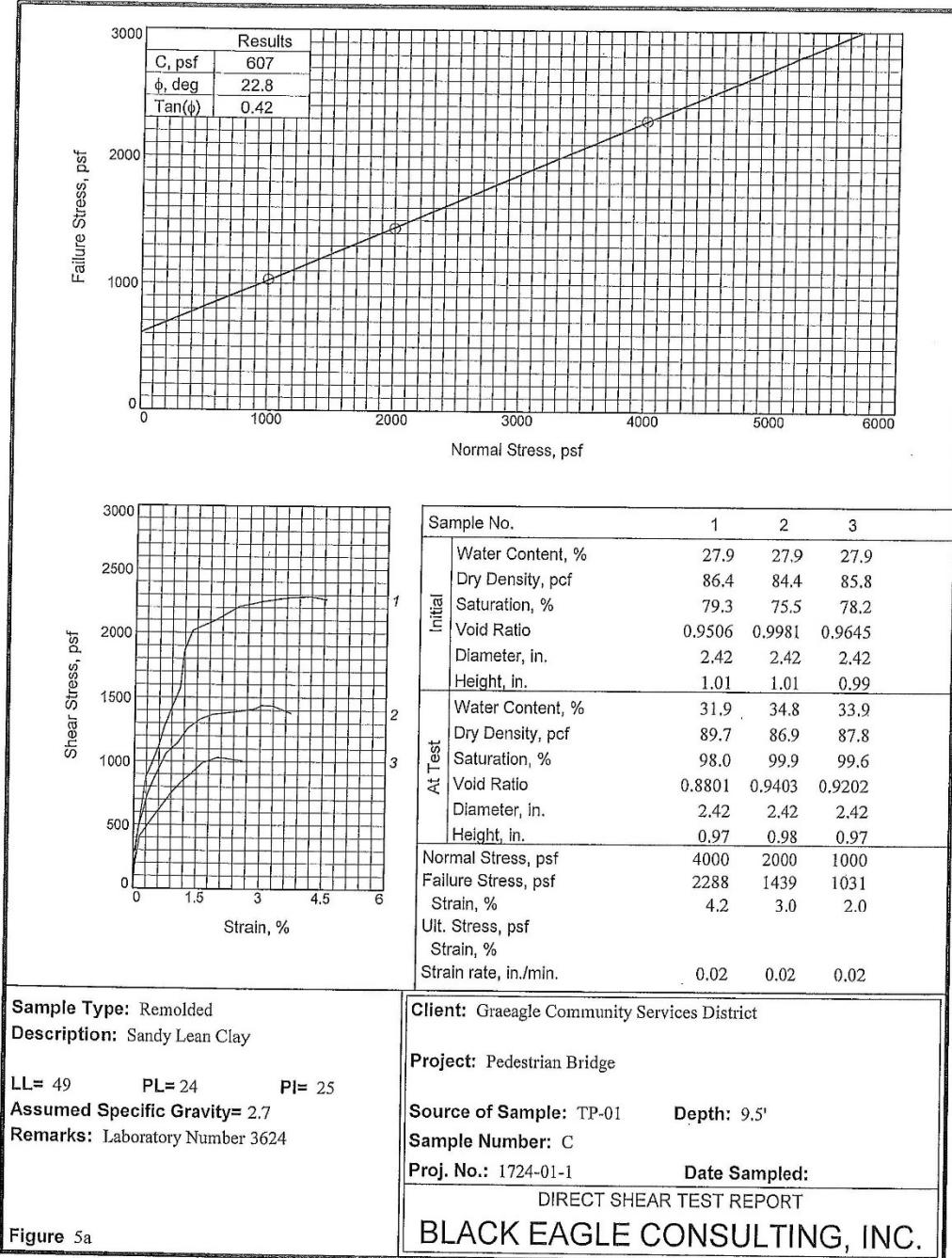
3



US GRAIN SIZE 1724-01.GPJ US LAB GDT 2/7/2014







Tested By: A. Dapra

Checked By: G. Bomberger



## APPENDICES

APPENDIX A  
Shallow Foundation Analysis Calculations



**BLACK EAGLE CONSULTING, INC.**  
Geotechnical and Construction Services

**Project Name:** Graeagle Pedestrian Bridge  
**Project Number:** 1724-01-1

Date: 1/27/2014  
Revision Number:  
Developed By: JWP  
Calculated By: JW  
Checked By:

## CALCULATION OF LRFD 6TH EDITION (2012) BEARING CAPACITY

Location: Abutment Footing On Level Groud at least B distance from a slope  
Foundation: 5 feet wide

### References

1. AASHTO, 2012, AASHTO LRFD Bridge Design Specifications, 6th Edition, American Association of State Highway and Transportation Officials.

### Assumptions

1. Bearing capacity calculations account for foundation shape, possibility of local or punching shear, inclined load, eccentric loading, sloping ground, and ground water.
2. Calculations assume one, homogeneous soil unit. Two-layer soil systems not supported.

### Unit Conversions

$$\text{psf} := \frac{\text{lbf}}{\text{ft}^2} \quad \text{pcf} := \frac{\text{lbf}}{\text{ft}^3} \quad \text{kip} := 1000\text{lbf} \quad \text{ksf} := \frac{\text{kip}}{\text{ft}^2} \quad \text{kPa} := 1000\text{Pa} \quad \text{kN} := 1000\text{N} \quad \text{kJ} := 1000\text{J}$$
$$g = 32.174 \frac{\text{ft}}{\text{s}^2}$$

### Input Data

### Checked By:

$$\text{Soil Cohesion: } c := 0 \text{ psf} \quad c = 0.0 \text{ kPa}$$

$$\text{Soil Friction Angle: } \phi := 38 \text{ deg}$$

$$\text{Total Soil Unit Weight: } \gamma := 20 \frac{\text{kN}}{\text{m}^3} \quad \gamma = 127.3 \text{ pcf}$$

$$\text{Depth of Foundation Base below Ground Surface: } D_f := 5 \text{ ft} \quad D_f = 1.52 \text{ m}$$

$$\text{Foundation Width B (For Circular Footings B = L): } B := 5 \text{ ft} \quad B = 1.52 \text{ m}$$

$$\text{Foundation Length L: } L := 15 \text{ ft} \quad L = 4.57 \text{ m}$$

$$\text{Depth of Ground Water from Ground Surface: } D_w := 2.5 \text{ ft} \quad D_w = 0.76 \text{ m}$$

$$\text{Slope of Adjacent Ground (if } j > 0, \text{ the modified N}_y \text{ and N}_c \text{ apply below, N}_q = 0): j := 0 \text{ deg}$$

$$\text{Cohesionless Sloping Ground Bearing Capacity Factor (p. 10-69 and/or 70): } N_{yslope} := 92$$

$$\text{Cohesive Sloping Ground Bearing Capacity Factor: } N_{cslope} := 0$$

$$\text{Is Local or Punching Shear Possible (Yes = "Y" and No = "N")? } F_{ps} := "N"$$

$$\text{Unfactored Vertical Load on Footing (Vertical): } V := 62.6 \text{ kip} \quad V = 278.5 \text{ kN}$$

$$\text{Unfactored Horiz Load on Footing (Enter 0 for vertical load only): } H := 3 \text{ kip} \quad H = 13.3 \text{ kN}$$

$$\text{Orientation of Horizontal Load (Enter 0 for parallel to long axis L): } \theta := 0 \text{ deg}$$

$$\text{Moment in x-Dimension (Footing Width): } M_x := 15 \text{ kip}\cdot\text{ft} \quad M_x = 20.3 \text{ kJ}$$

$$\text{Moment in y-Dimension (Footing Length): } M_y := 229 \text{ kip}\cdot\text{ft} \quad M_y = 310.5 \text{ kJ}$$

$$\text{Adhesion Between Footing and Foundation Soil for Sliding: } c_a := 0 \text{ psf} \quad c_a = 0.0 \text{ kPa}$$

$$\text{Angle of Friction Between Footing and Foundation Soil for Sliding: } \delta := 0.8 \cdot \phi \quad \delta = 30.4 \text{ deg}$$

Sliding Resistance Factor for the Strength Limit State:	$\phi_t := 0.80$ CIP on sand
Bearing Resistance Factor for the Strength Limit State:	$\phi_b := 0.45$ This is a the Munkah (2001) approach, $\phi_b$ varies from 0.45 to 0.5
Bearing Resistance Factor for Extreme State(scour, EQ, ice, impacts = 1.0)	
Bearing Resistance Factor for Service State (Settlements and Servicability = 1.0)	

An exception for service limit state 1 is that overall stability shall use resistance factors in Article 11.6.2.3

**Calculations, Section 1: Bearing Pressures, Eccentricity Reduction**      **Checked By:**

Calculate Eccentricity in Footing "B" Direction:

$$e_B := \frac{M_y}{V} \quad e_B = 3.7 \text{ ft} \quad e_B = 1.12 \text{ m}$$

Calculate Eccentricity in Footing "L" Direction:

$$e_L := \frac{M_x}{V} \quad e_L = 0.2 \text{ ft} \quad e_L = 0.07 \text{ m}$$

Calculate Eccentric Loading Reduced Footing Dimensions:

$$B' := B - 2 \cdot e_B \quad B' = -2.3 \text{ ft} \quad B' = -0.71 \text{ m}$$

$$L' := L - 2 \cdot e_L \quad L' = 14.5 \text{ ft} \quad L' = 4.43 \text{ m}$$

Determine Effective Footing Dimensions based on any Eccentricity:

$$B'_w := \begin{cases} B' & \text{if } e_B > 0 \text{ ft} \\ B & \text{otherwise} \end{cases} \quad B' = -2.3 \text{ ft} \quad B' = -0.71 \text{ m}$$

$$L'_w := \begin{cases} L' & \text{if } e_L > 0 \text{ ft} \\ L' & \text{otherwise} \end{cases} \quad L' = 14.5 \text{ ft} \quad L' = 4.43 \text{ m}$$

Calculate the Eccentric Loading Effective Footing Area:

$$A' := |B' \cdot L'| \quad A' = 33.6 \text{ ft}^2 \quad A' = 3.12 \text{ m}^2$$

**Calculations, Section 2: Bearing Capacity Coefficients**      **Checked By:**

Calculate Reduced Shear Strength Parameters if Local or Punching Shear is Possible:

$$c_w := \begin{cases} 0.67 \cdot c & \text{if } F_{ps} = "Y" \\ c & \text{otherwise} \end{cases} \quad c = 0.0 \text{ psf} \quad c = 0.0 \text{ kPa}$$

$$\phi_w := \begin{cases} \tan(0.67 \cdot \tan(\phi)) & \text{if } F_{ps} = "Y" \\ \phi & \text{otherwise} \end{cases} \quad \phi = 38 \text{ deg}$$

Calculate Bearing Capacity Factors:

$$N_q := \exp(\pi \cdot \tan(\phi)) \cdot \tan\left(45\text{deg} + \frac{\phi}{2}\right)^2 \quad N_q = 48.933$$

$$N_c := \max[(N_q - 1) \cdot \cot(\max(\phi, 0.01\text{deg})), 5.14] \quad \phi = 0.663 \quad N_c = 61.352$$

$$N_y := 2 \cdot (N_q + 1) \cdot \tan(\phi) \quad N_y = 78.024$$

Calculate the Ground Water Factors Cwy and Cwq:

$$C_{wq} := \begin{cases} 0.5 & \text{if } D_w = 0 \\ 1 & \text{if } D_w > 1.5 \cdot B + D_f \\ 0.5 + 0.5 \cdot \frac{D_w}{1.5 \cdot B + D_f} & \text{otherwise} \end{cases} \quad C_{wq} = 0.6$$

$$C_{wy} := \begin{cases} 0.5 & \text{if } D_w \leq D_f \\ 1 & \text{if } D_w > 1.5 \cdot B + D_f \\ 0.5 + 0.5 \cdot \frac{D_w - D_f}{1.5 \cdot B} & \text{otherwise} \end{cases} \quad C_{wy} = 0.5$$

Calculate Depth Factors:

$$\phi = 38 \text{ deg}$$

$$\min\left(\frac{D_f}{B}, 8\right) = 1$$

$$dq_{42} := \begin{pmatrix} 0 & 1 \\ 1 & 1.15 \\ 2 & 1.20 \\ 4 & 1.25 \\ 8 & 1.30 \end{pmatrix}$$

$$dq_{37} := \begin{pmatrix} 0 & 1 \\ 1 & 1.20 \\ 2 & 1.25 \\ 4 & 1.30 \\ 8 & 1.35 \end{pmatrix}$$

$$dq_{32} := \begin{pmatrix} 0 & 1 \\ 1 & 1.20 \\ 2 & 1.30 \\ 4 & 1.35 \\ 8 & 1.40 \end{pmatrix}$$

The first columns of vectors above is Df/B. Correlation only valid for friction angles of 32 to 42 degrees; above 42 degrees, value for 42 degrees is considered conservative.

$$d_q := \begin{cases} \text{jinterp}\left(dq_{42}^{\langle 0 \rangle}, dq_{42}^{\langle 1 \rangle}, \min\left(\frac{D_f}{B}, 8\right)\right) & \text{if } \phi \geq 42 \text{ deg} \\ \text{linterp}\left(dq_{37}^{\langle 0 \rangle}, dq_{37}^{\langle 1 \rangle}, \min\left(\frac{D_f}{B}, 8\right)\right) & \text{if } 42 \text{ deg} > \phi \geq 37 \text{ deg} \\ \text{linterp}\left(dq_{32}^{\langle 0 \rangle}, dq_{32}^{\langle 1 \rangle}, \min\left(\frac{D_f}{B}, 8\right)\right) & \text{if } 37 \text{ deg} > \phi \geq 32 \text{ deg} \\ 1 & \text{otherwise} \end{cases} \quad d_q = 1.2$$

Calculate Footing Shape Factors:

$$s_c := \begin{cases} 1 + \left(\frac{B'}{L'}\right) \cdot \frac{N_d}{N_c} & \text{if } \phi > 0 \\ 1 + \frac{B'}{5 \cdot L'} & \text{otherwise} \end{cases} \quad (\text{all terms to go 1.0 for strip footing}) \quad s_c = 0.873$$

$$s_q := \begin{cases} 1 + \left(\frac{B'}{L'}\right) \cdot \tan(\phi) & \text{if } \phi > 0 \\ 1 & \text{otherwise} \end{cases} \quad s_q = 0.875$$

$$s_y := \begin{cases} 1 - 0.4 \cdot \left(\frac{B'}{L'}\right) & \text{if } \phi > 0 \\ 1 & \text{otherwise} \end{cases} \quad s_y = 1.064$$

Calculate Inclined Loading Factors:

$$n := \left( \frac{2 + \frac{L'}{B'}}{1 + \frac{L'}{B'}} \right) \cdot \cos(\theta)^2 + \left( \frac{2 + \frac{B'}{L'}}{1 + \frac{B'}{L'}} \right) \cdot \sin(\theta)^2 \quad n = 0.81$$

$$i_q := \left( 1 - \frac{H}{V + c \cdot B' \cdot L' \cdot \cot(\phi)} \right)^n \quad i_q = 0.961$$

$$i_c := \begin{cases} i_q - \left( \frac{1 - i_q}{N_q - 1} \right) & \text{if } \phi > 0 \text{deg} \\ 1 - \left( \frac{n \cdot H}{c \cdot B' \cdot L' \cdot N_c} \right) & \text{otherwise} \end{cases}$$

$i_c = 0.96$

$$i_\gamma := \left( 1 - \frac{H}{V + B' \cdot L' \cdot c \cdot \cot(\phi)} \right)^{n+1}$$

$i_\gamma = 0.915$

Calculate Modified Bearing Capacity Coefficients:  $j = 0 \text{ deg}$

$$N_{cm} := \begin{cases} N_c \cdot s_c \cdot i_c & \text{if } j = 0 \text{deg} \\ N_{cslope} \cdot s_c \cdot i_c & \text{otherwise} \end{cases}$$

$N_{cm} = 51.414$

$$N_{qm} := \begin{cases} N_q \cdot s_q \cdot d_q \cdot i_q & \text{if } j = 0 \text{deg} \\ 0 & \text{otherwise} \end{cases}$$

$N_{qm} = 49.397$

$$N_{ym} := \begin{cases} N_\gamma \cdot s_\gamma \cdot i_\gamma & \text{if } j = 0 \text{deg} \\ N_{yslope} \cdot s_\gamma \cdot i_\gamma & \text{otherwise} \end{cases}$$

$N_{ym} = 75.942$

### Calculations, Section 3: Sliding Check

Checked By:

Calculate the Maximum Resistance Force Between Footing and Foundation Soil for Sliding Failure:

$$P_{max} := V \cdot \tan(\delta) + B \cdot L \cdot c_a$$

$P_{max} = 36.7 \text{ kip} \quad P_{max} = 163.4 \text{ kN}$

Calculate the Factored Resistance Against Sliding Failure:

$$P_{fres} := P_{max} \cdot \phi_\tau$$

$P_{fres} = 29.382 \text{ kip} \quad P_{fres} = 130.697 \text{ kN}$

Check Sliding Factor of Safety:

$$\text{Check}_1 := \begin{cases} 1 & \text{if } H < P_{fres} \\ 0 & \text{otherwise} \end{cases}$$

$\text{Check}_1 = 1$   
If  $\text{Check}_1 = 0$ , sliding factor of safety below acceptable value.

### Calculations, Section 4: Bearing Capacity

Checked By:

Calculate Ultimate Bearing Capacity: Eq. 10.6.3.1.2a-1 Note that g term is included in unit weight

$$q_n := c \cdot N_{cm} + \gamma \cdot D_F \cdot N_{qm} \cdot C_{wq} + 0.5 \cdot \gamma \cdot B' \cdot N_{ym} \cdot C_{w\gamma}$$

$q_n = 13.3 \text{ ksf} \quad q_n = 635.3 \text{ kPa}$

Calculate Unfactored Bearing Capacity:

$$q_R := q_n \cdot \phi_b$$

Bearing Pressure:  $q_L := \frac{V}{A'}$

$$\text{Check}_2 := \begin{cases} 1 & \text{if } q_L < q_n \\ 0 & \text{otherwise} \end{cases}$$

$q_R = 6.0 \text{ ksf} \quad q_R = 285.9 \text{ kPa}$   
 $q_L = 1.861 \text{ ksf} \quad q_L = 89.1 \text{ kPa}$   
 $\text{Check}_2 = 1$

-----  
**Nominal (ultimate) bearing capacity:**      **Ultimate sliding resistance**      **Sliding OK (1) or not OK (0)?**

$$q_n = 13.3 \text{ ksf} \quad q_n = 635.288 \text{ kPa} \quad P_{max} = 37 \text{ kip} \quad P_{max} = 163 \text{ kN} \quad \text{Check}_1 = 1$$

**Strength / factored bearing capacity**      **Factored Sliding Resistance**      **Ultimate Bearing OK (1) or not OK (0)?**

$$q_R = 6 \text{ ksf} \quad q_R = 285.88 \text{ kPa} \quad P_{fres} = 29 \text{ kip} \quad P_{fres} = 131 \text{ kN} \quad \text{Check}_2 = 1$$

**BLACK EAGLE CONSULTING, INC.**  
**Geotechnical and Construction Services**  
**Project Name: Graeagle Pedestrian Bridge**  
**Project Number: 1724-01-1**

Date: 1/27/2014  
Revision Number:  
Developed By: JWP  
Calculated By: JW  
Checked By:

## CALCULATION OF LRFD 6TH EDITION (2012) BEARING CAPACITY

Location: Abutment Footing On Level Groud at least B distance from a slope  
Foundation: 10 feet wide

### References

1. AASHTO, 2012, AASHTO LRFD Bridge Design Specifications, 6th Edition, American Association of State Highway and Transportation Officials.

### Assumptions

1. Bearing capacity calculations account for foundation shape, possibility of local or punching shear, inclined load, eccentric loading, sloping ground, and ground water.
2. Calculations assume one, homogeneous soil unit. Two-layer soil systems not supported.

### Unit Conversions

### Checked By:

$$\text{psf} := \frac{\text{lbf}}{\text{ft}^2} \quad \text{pcf} := \frac{\text{lbf}}{\text{ft}^3} \quad \text{kip} := 1000\text{lbf} \quad \text{ksf} := \frac{\text{kip}}{\text{ft}^2} \quad \text{kPa} := 1000\text{Pa} \quad \text{kN} := 1000\text{N} \quad \text{kJ} := 1000\text{J}$$

$$g = 32.174 \frac{\text{ft}}{\text{s}^2}$$

### Input Data

### Checked By:

Soil Cohesion:  $c := 0\text{psf}$   $c = 0.0\text{kPa}$

Soil Friction Angle:  $\phi := 38\text{deg}$

Total Soil Unit Weight:  $\gamma := 20 \frac{\text{kN}}{\text{m}^3}$   $\gamma = 127.3 \text{pcf}$

Depth of Foundation Base below Ground Surface:  $D_f := 5\text{ft}$   $D_f = 1.52\text{ m}$

Foundation Width B (For Circular Footings B = L):  $B := 10\text{ft}$   $B = 3.05\text{ m}$

Foundation Length L:  $L := 15\text{ft}$   $L = 4.57\text{ m}$

Depth of Ground Water from Ground Surface:  $D_w := 2.5\text{ft}$   $D_w = 0.76\text{ m}$

Slope of Adjacent Ground (if j>0, the modified Ny and Nc apply below, Nq=0):  $j := 0\text{deg}$

Cohesionless Sloping Ground Bearing Capacity Factor (p. 10-69 and/or 70):  $N_{yslope} := 92$

Cohesive Sloping Ground Bearing Capacity Factor:  $N_{cslope} := 0$

Is Local or Punching Shear Possible (Yes = "Y" and No = "N")?  $F_{ps} := "N"$

Unfactored Vertical Load on Footing (Vertical):  $V := 62.6\text{kip}$   $V = 278.5\text{kN}$

Unfactored Horiz Load on Footing (Enter 0 for vertical load only):  $H := 3\text{kip}$   $H = 13.3\text{kN}$

Orientation of Horizontal Load (Enter 0 for parallel to long axis L):  $\theta := 0\text{deg}$

Moment in x-Dimension (Footing Width):  $M_x := 30\text{kip}\cdot\text{ft}$   $M_x = 40.7\text{ kJ}$

Moment in y-Dimension (Footing Length):  $M_y := 229\text{kip}\cdot\text{ft}$   $M_y = 310.5\text{kJ}$

Adhesion Between Footing and Foundation Soil for Sliding:  $c_a := 0\text{psf}$   $c_a = 0.0\text{kPa}$

Angle of Friction Between Footing and Foundation Soil for Sliding:  $\delta := 0.8 \cdot \phi$   $\delta = 30.4\text{ deg}$

Sliding Resistance Factor for the Strength Limit State:	$\phi_s := 0.80$ CIP on sand
Bearing Resistance Factor for the Strength Limit State:	$\phi_b := 0.45$ This is a the Munkahk (2001) approach, $\phi_b$ varies from 0.45 to 0.5
Bearing Resistance Factor for Extreme State(scour, EQ, ice, impacts = 1.0)	
Bearing Resistance Factor for Service State (Settlements and Servicability = 1.0)	

An exception for service limit state 1 is that overall stability shall use resistance factors in Article 11.6.2.3

**Calculations, Section 1: Bearing Pressures, Eccentricity Reduction**      **Checked By:**

Calculate Eccentricity in Footing "B" Direction:

$$e_B := \frac{M_y}{V} \quad e_B = 3.7 \text{ ft} \quad e_B = 1.12 \text{ m}$$

Calculate Eccentricity in Footing "L" Direction:

$$e_L := \frac{M_x}{V} \quad e_L = 0.5 \text{ ft} \quad e_L = 0.15 \text{ m}$$

Calculate Eccentric Loading Reduced Footing Dimensions:

$$B' := B - 2 \cdot e_B \quad B' = 2.7 \text{ ft} \quad B' = 0.82 \text{ m}$$

$$L' := L - 2 \cdot e_L \quad L' = 14.0 \text{ ft} \quad L' = 4.28 \text{ m}$$

Determine Effective Footing Dimensions based on any Eccentricity:

$$B' := \begin{cases} B' & \text{if } e_B > 0 \text{ ft} \\ B & \text{otherwise} \end{cases} \quad B' = 2.7 \text{ ft} \quad B' = 0.82 \text{ m}$$

$$L' := \begin{cases} L' & \text{if } e_L > 0 \text{ ft} \\ L' & \text{otherwise} \end{cases} \quad L' = 14.0 \text{ ft} \quad L' = 4.28 \text{ m}$$

Calculate the Eccentric Loading Effective Footing Area:

$$A' := |B' \cdot L'| \quad A' = 37.7 \text{ ft}^2 \quad A' = 3.50 \text{ m}^2$$

**Calculations, Section 2: Bearing Capacity Coefficients**      **Checked By:**

Calculate Reduced Shear Strength Parameters if Local or Punching Shear is Possible:

$$\gamma := \begin{cases} 0.67 \cdot c & \text{if } F_{ps} = "Y" \\ c & \text{otherwise} \end{cases} \quad c = 0.0 \text{ psf} \quad c = 0.0 \text{ kPa}$$

$$\phi := \begin{cases} \tan(0.67 \cdot \tan(\phi)) & \text{if } F_{ps} = "Y" \\ \phi & \text{otherwise} \end{cases} \quad \phi = 38 \text{ deg}$$

Calculate Bearing Capacity Factors:

$$N_q := \exp\left(\pi \cdot \tan(\phi)\right) \cdot \tan\left(45\text{deg} + \frac{\phi}{2}\right)^2 \quad N_q = 48.933$$

$$N_c := \max\left[\left(N_q - 1\right) \cdot \cot(\max(\phi, 0.01\text{deg})), 5.14\right] \quad \phi = 0.663 \quad N_c = 61.352$$

$$N_\gamma := 2 \cdot (N_q + 1) \cdot \tan(\phi) \quad N_\gamma = 78.024$$

Calculate the Ground Water Factors Cwq and Cwq:

$$C_{wq} := \begin{cases} 0.5 & \text{if } D_w = 0 \\ 1 & \text{if } D_w > 1.5 \cdot B + D_f \\ 0.5 + 0.5 \cdot \frac{D_w}{1.5 \cdot B + D_f} & \text{otherwise} \end{cases} \quad C_{wq} = 0.563$$

$$C_{wy} := \begin{cases} 0.5 & \text{if } D_w \leq D_f \\ 1 & \text{if } D_w > 1.5 \cdot B + D_f \\ 0.5 + 0.5 \cdot \frac{D_w - D_f}{1.5 \cdot B} & \text{otherwise} \end{cases} \quad C_{wy} = 0.5$$

Calculate Depth Factors:

$$\phi = 38 \text{ deg} \quad dq_{42} := \begin{pmatrix} 0 & 1 \\ 1 & 1.15 \\ 2 & 1.20 \\ 4 & 1.25 \\ 8 & 1.30 \end{pmatrix} \quad dq_{37} := \begin{pmatrix} 0 & 1 \\ 1 & 1.20 \\ 2 & 1.25 \\ 4 & 1.30 \\ 8 & 1.35 \end{pmatrix} \quad dq_{32} := \begin{pmatrix} 0 & 1 \\ 1 & 1.20 \\ 2 & 1.30 \\ 4 & 1.35 \\ 8 & 1.40 \end{pmatrix}$$

The first columns of vectors above is Df/B. Correlation only valid for friction angles of 32 to 42 degrees; above 42 degrees, value for 42 degrees is considered conservative.

$$d_q := \begin{cases} \text{interp}\left(dq_{42}^{\langle\phi\rangle}, dq_{42}^{\langle\psi\rangle}, \min\left(\frac{D_f}{B}, 8\right)\right) & \text{if } \phi \geq 42\text{deg} \\ \text{interp}\left(dq_{37}^{\langle\phi\rangle}, dq_{37}^{\langle\psi\rangle}, \min\left(\frac{D_f}{B}, 8\right)\right) & \text{if } 42\text{deg} > \phi \geq 37\text{deg} \\ \text{interp}\left(dq_{32}^{\langle\phi\rangle}, dq_{32}^{\langle\psi\rangle}, \min\left(\frac{D_f}{B}, 8\right)\right) & \text{if } 37\text{deg} > \phi \geq 32\text{deg} \\ 1 & \text{otherwise} \end{cases} \quad d_q = 1.1$$

Calculate Footing Shape Factors:

$$s_c := \begin{cases} 1 + \left(\frac{B'}{L'}\right) \cdot \left(\frac{N_q}{N_c}\right) & \text{if } \phi > 0 \\ 1 + \frac{B'}{5 \cdot L'} & \text{otherwise} \end{cases} \quad (\text{all terms to go 1.0 for strip footing}) \quad s_c = 1.152$$

$$s_q := \begin{cases} 1 + \left(\frac{B'}{L'}\right) \cdot \tan(\phi) & \text{if } \phi > 0 \\ 1 & \text{otherwise} \end{cases} \quad s_q = 1.149$$

$$s_\gamma := \begin{cases} 1 - 0.4 \cdot \left(\frac{B'}{L'}\right) & \text{if } \phi > 0 \\ 1 & \text{otherwise} \end{cases} \quad s_\gamma = 0.924$$

Calculate Inclined Loading Factors:

$$n := \left( \frac{2 + \frac{L'}{B'}}{1 + \frac{L'}{B'}} \right) \cdot \cos(\theta)^2 + \left( \frac{2 + \frac{B'}{L'}}{1 + \frac{B'}{L'}} \right) \cdot \sin(\theta)^2 \quad n = 1.16$$

$$i_q := \left( 1 - \frac{H}{V + c \cdot B' \cdot L' \cdot \cot(\phi)} \right)^n \quad i_q = 0.945$$

$$i_c := \begin{cases} i_q - \left( \frac{1 - i_q}{N_q - 1} \right) & \text{if } \phi > 0 \text{deg} \\ 1 - \left( \frac{n \cdot II}{c \cdot B' \cdot L' \cdot N_c} \right) & \text{otherwise} \end{cases}$$

$i_c = 0.943$

$$i_\gamma := \left( 1 - \frac{H}{V + B' \cdot L' \cdot c \cdot \cot(\phi)} \right)^{n+1}$$

$i_\gamma = 0.899$

Calculate Modified Bearing Capacity Coefficients:  $j = 0 \text{ deg}$

$$N_{cm} := \begin{cases} N_c \cdot s_c \cdot i_c & \text{if } j = 0 \text{deg} \\ N_{cslope} \cdot s_c \cdot i_c & \text{otherwise} \end{cases}$$

$N_{cm} = 66.706$

$$N_{qm} := \begin{cases} N_q \cdot s_q \cdot d_q \cdot i_q & \text{if } j = 0 \text{deg} \\ 0 & \text{otherwise} \end{cases}$$

$N_{qm} = 58.437$

$$N_{ym} := \begin{cases} N_y \cdot s_y \cdot i_y & \text{if } j = 0 \text{deg} \\ N_{yslope} \cdot s_y \cdot i_y & \text{otherwise} \end{cases}$$

$N_{ym} = 64.805$

### Calculations, Section 3: Sliding Check

Checked By:

Calculate the Maximum Resistance Force Between Footing and Foundation Soil for Sliding Failure:

$$P_{max} := V \cdot \tan(\delta) + B \cdot L \cdot c_a$$

$P_{max} = 36.7 \text{ kip} \quad P_{max} = 163.4 \text{ kN}$

Calculate the Factored Resistance Against Sliding Failure:

$$P_{fres} := P_{max} \cdot \phi_t$$

$P_{fres} = 29.382 \text{ kip} \quad P_{fres} = 130.697 \text{ kN}$

Check Sliding Factor of Safety:

$$Check_1 := \begin{cases} 1 & \text{if } H < P_{fres} \\ 0 & \text{otherwise} \end{cases}$$

$Check_1 = 1$   
*If  $Check_1 = 0$ , sliding factor of safety below acceptable value.*

### Calculations, Section 4: Bearing Capacity

Checked By:

Calculate Ultimate Bearing Capacity: Eq. 10.6.3.1.2a-1 Note that g term is included in unit weight

$$q_u := c \cdot N_{cm} + \gamma \cdot D_f \cdot N_{qm} \cdot C_{wq} + 0.5 \cdot \gamma \cdot B' \cdot N_{ym} \cdot C_{wy}$$

$q_u = 26.5 \text{ ksf} \quad q_u = 1267.0 \text{ kPa}$

Calculate Unfactored Bearing Capacity:

$$q_R := q_n \cdot \phi_b$$

Bearing Pressure:  $q_L := \frac{V}{A'}$

$$Check_2 := \begin{cases} 1 & \text{if } q_L < q_n \\ 0 & \text{otherwise} \end{cases}$$

$q_R = 11.9 \text{ ksf} \quad q_R = 570.1 \text{ kPa}$   
 $q_L = 1.661 \text{ ksf} \quad q_L = 79.5 \text{ kPa}$   
 $Check_2 = 1$

**Nominal (ultimate) bearing capacity:**      **Ultimate sliding resistance**      **Sliding OK (1) or not OK (0)?**

$$q_n = 26.5 \text{ ksf} \quad q_n = 1.267 \times 10^3 \text{ kPa}$$

$P_{max} = 37 \text{ kip} \quad P_{max} = 163 \text{ kN}$

$Check_1 = 1$

**Strength I factored bearing capacity**      **Factored Sliding Resistance**      **Ultimate Bearing OK (1) or not OK (0)?**

$$q_R = 11.9 \text{ ksf} \quad q_R = 570.131 \text{ kPa}$$

$P_{fres} = 29 \text{ kip} \quad P_{fres} = 131 \text{ kN}$

$Check_2 = 1$

**Project Name:** Graelagle Pedestrian Bridge  
**Project No.:** 1724-01-1  
**Description**: GM/GP-M underlain by CL/ML Soils  
 Maximum service bearing pressure to limit the settlement 1 inch or less

**Developed By:** JW  
**Calculated By:** JW  
**Checked By:**  
**Date:** 1/27/2014

### CALCULATION OF CONSOLIDATION SETTLEMENT

Depth from base of the ftg, ft	Soil Type C-Clay G- Granular	Layer thickness, ft	Mid Depth below ftg level, ft	Effective Stress at mid-depth, psf	Stress Increase (assuming 2:1 spread), psf	Final Stress, psf	Initial void ratio, $e_0$	Compression Index, $C_c$	Rebound Index, $C_s$	OCR	Influence depth =	Check Settlement:	
												Footing Width (B) = 2.5 ft	0.99 inch
0	G	1	0.5	500	8338	8838	1.10	0.300	0.030	2.7	-	-	0.0213
1	G	1	1.5	563	6643	7206	1.10	0.300	0.030	3.3	-	-	0.0437
2	G	1	2.5	626	5429	6054	1.10	0.300	0.030	4.0	-	-	0.0662
3	G	1	3.5	688	4531	5219	1.10	0.300	0.030	4.6	-	-	0.0810
4	G	1	4.5	751	3846	4597	1.10	0.300	0.030	5.2	-	-	0.0958
5	G	1	5.5	813	3310	4123	1.10	0.300	0.030	5.8	-	-	0.12
6	C	2	7.0	907	2659	3606	1.10	0.300	0.030	6.7	0.018	-	0.21
8	C	2	9.0	1032	2121	3153	1.10	0.300	0.030	7.6	0.015	-	0.17
10	C	2	11.0	1158	1713	2870	1.10	0.300	0.030	8.4	0.012	-	0.14
12	C	2	13.0	1283	1414	2656	1.10	0.300	0.030	8.9	0.010	-	0.11
14	C	4	16.0	1471	1094	2565	1.10	0.300	0.030	9.4	0.007	-	-
18	C	4	19.0	1658	873	2532	1.10	0.300	0.030	9.5	-	-	-
20	g	2	20										0.99

\*Settlement of granular soils calculated from Schmertmann Method (Modified)  
 Total Primary Consolidation Settlement = 0.99 inch



## **SETTLEMENT ANALYSIS OF SHALLOW FOUNDATIONS**

### **Granular Soils - Schmertmann Method (Modified)**

### **Fine Grain Soils - Calculation of Consolidation Settlement**

**Project Name:** Graeagle Pedestrian Bridge      **Calculated By:** jw  
**Project Number:** 1724-01-1      **Date:** 1/27/2014  
**Description:** GM/GP-M underlain by CL/ML Soils  
Maximum service bearing pressure to limit the settlement 1 inch or below

Maximum service bearing pressure to limit the settlement 1 inch or below		
Input Units Shape	E E or SI RE, SQ, CI, CO, or RE	q = 9500 lb/ft <sup>2</sup> delta = 0.25 in
B =	5 ft	
L =	15 ft	
D =	5 ft	
P =	668 k	
Dw =	2.5 ft	(observed shallow ground water at north abutment location)
gamma =	125 lb/ft <sup>3</sup>	
t =	0.1 yr	(short-term settlement)

Depth to Soil Layer		Es (lb/ft <sup>2</sup> )	zf (ft)	l epsilon	strain (%)	delta (in)
Top (ft)	Bottom (ft)					
0.0	5.0					
5.0	6.0	1200000	0.5	0.258	0.1776	0.0213
6.0	7.0	1200000	1.5	0.529	0.3644	0.0437
7.0	8.0	1200000	2.5	0.800	0.5515	0.0662
8.0	9.0	1200000	3.5	0.737	0.5082	0.0610
9.0	10.0	1200000	4.5	0.675	0.4648	0.0558

\*Settlement of granular soils at abutment footings included in calculation of consolidation settlement.

Black Eagle Consulting, Inc

Reno, NV (775)359-6600

page 1 of 2

Project Name:  
1724-01-1  
Project No.:  
GMGP-M underlain by CL/ML Soils  
Description

Graeagle Pedestrian Bridge  
Maximum service bearing pressure to limit the settlement 1 inch or less

Developed By: JW  
Calculated By: JW  
Checked By:  
Date: 1/27/2014

#### CALCULATION OF CONSOLIDATION SETTLEMENT

Depth from base of the soil, ft.	Layer thickness, ft	Mid Depth below fg level, ft	Effective Stress at mid-depth, psf	Stress Increase (assuming 2:1 spread), psf	Final Stress, psf	Initial void ratio, e <sub>0</sub>	Compression Index, C <sub>c</sub>	Rebound Index, C <sub>s</sub>	OCR	Void ratio change	Check Settlement:	
											Footprint Width (B) =	0.98 inch
0											Footprint Length (L) =	10.00 ft
1	G	1	0.5	500	5550	6030	1.10	0.300	0.030	4.0	Applied footing pressure =	15.00 ft
2	G	1	1.5	563	4743	5306	1.10	0.300	0.030	4.5	Footing Depth (D) =	6000 psf
3	G	1	2.5	626	4114	4740	1.10	0.300	0.030	5.1		5.00 ft
4	G	1	3.5	688	3604	4292	1.10	0.300	0.030	5.6		
5	G	1	4.5	751	3133	3934	1.10	0.300	0.030	6.1		
6	C	1	5.5	813	2832	3646	1.10	0.300	0.030	6.6		
8	C	2	7.0	907	2406	3314	1.10	0.300	0.030	7.2		
10	C	2	9.0	1032	1974	3006	1.10	0.300	0.030	8.0		
12	C	2	11.0	1158	1648	2806	1.10	0.300	0.030	8.6		
14	C	2	13.0	1283	1398	2680	1.10	0.300	0.030	9.0		
18	C	4	16.0	1471	1117	2587	1.10	0.300	0.030	9.3		
20	g	2	19.0	1658	913	2571	1.10	0.300	0.030	9.3		
		20										

\*Settlement of granular soils calculated from Schmertmann Method (Modified)  
Total Primary Consolidation Settlement = 0.98 inch

0.98  
\_\_\_\_\_



**SETTLEMENT ANALYSIS OF SHALLOW FOUNDATIONS**  
**Granular Soils - Schmertmann Method (Modified)**  
**Fine Grain Soils - Calculation of Consolidation Settlement**

Project Name: Graeagle Pedestrian Bridge                          Calculated By: jw  
 Project Number: 1724-01-1    Date: 1/27/2014  
 Description: GM/GP-M underlain by CL/ML Soils  
 Maximum service bearing pressure to limit the settlement 1 inch or less

Input	Results
Units	E E or SI
Shape	RE SQ, CI, CO, or RE
B =	10 ft
L =	15 ft
D =	5 ft
P =	811 k
Dw =	2.5 ft
gamma =	125 lb/ft^3
t =	0.1 yr
	(observed shallow ground water at north abutment location)
	(short-term settlement)
	$q = 6001 \text{ lb/ft}^2$
	delta = 0.11 in

Depth to Soil Layer						
Top (ft)	Bottom (ft)	Es (lb/ft^2)	zf (ft)	I epsilon	strain (%)	delta (in)
0.0	5.0					
5.0	6.0	1200000	0.5	0.170	0.0739	0.0089
6.0	7.0	1200000	1.5	0.299	0.1298	0.0156
7.0	8.0	1200000	2.5	0.427	0.1858	0.0223
8.0	9.0	1200000	3.5	0.556	0.2418	0.0290
9.0	10.0	1200000	4.5	0.685	0.2977	0.0357

\*Settlement of granular soils at abutment footings included in calculation of consolidation settlement.

**Project Name** Pedestrian Bridge  
**Project No.:** 1724-01-1  
**Description** Sandy lean clay

**Reference:** Bowles, J. E., 1996b, 5th ed., Foundation Analysis and Design, McGraw Hill.

Index Test Results

Method	C <sub>c</sub>	C <sub>s</sub>
1	0.351	0.070
2	0.327	0.065
3	0.273	0.055
4	0.419	0.084
5	0.248	0.050
6	0.605	0.121
7	0.301	0.060
average	<b>0.361</b>	<b>0.072</b>
std. devi	0.121	0.024
max	0.605	0.121
min	0.248	0.050

Other Methods to Estimate C<sub>c</sub> (Refer Bowles)

	Percentage of Fines	G <sub>s</sub> =	
Liquid Limit		2.65	
Plastic Limit			Initial void ratio e <sub>0</sub> =
Plasticity Index			w G <sub>s</sub> =
Natural water content			only for 100% saturation (S = 100 %)

Note: Strain basis compression ratio, C'c = C<sub>c</sub> / (1+e<sub>0</sub>)

Developed By: PV  
Calculated By: JW  
Checked By:  
Date: 1/27/2014

Then, the preconsolidation Pressure,  

$$P_c = \frac{q_u / 2}{0.11 + 0.0037 PI}$$

Unconfined Compressive Strength, q<sub>u</sub> = 10000 psf  
(Average pocket penetrometer reading/lab test result)

Use: C<sub>c</sub> = 0.361      C<sub>s</sub> = 0.072

and C<sub>s</sub> = 0.20 C<sub>c</sub>

Use: C<sub>c</sub> = 0.361      C<sub>s</sub> = 0.072

Compression Index (NC Line)      Re-compression Index (OC Line)

$$P_c = \frac{q_u / 2}{0.11 + 0.0037 PI}$$

Use: P<sub>c</sub> = 24691 psf

Use: P<sub>s</sub> = 24000 psf

<b>Project Name:</b>	<b>Graeagle Pedestrian Bridge</b>	<b>Developed By:</b>	PV
<b>Project Number:</b>	1724-01-1	<b>Calculated By:</b>	PV
<b>Subject:</b>	Abutments Foundations	<b>Checked By:</b>	
	5 to 10 feet wide	<b>Date:</b>	2/14/2014
	10 to 15 feet long		

#### **SPRING STIFFNESS VALUES FOR SPREAD FOUNDATION (ELASTIC HALF-SPACE APPROACH)**

##### Reference:

1. Seismic Retrofitting Manual for Highway Structures: Part 1 - Bridges,  
Federal Highway Administration (FHA) Publication No. FHWA-HRT-06-032, January 2006.

##### Footing Parameters

Length of the footing, L =	10 ft
Width of the footing, B =	5 ft
Thickness of the footing, d =	2 ft
Embedment Depth, D =	5 ft
Depth to water table, D <sub>w</sub> =	2.5 ft
L/B =	2.0

##### Soil Parameters

Poisson's ratio, v =	0.5	0.35 for unsaturated soils saturated soils use 0.5
Shear-Wave Velocity, Vs =	1100 ft/s	
From ReMi survey considering D to D+2B depth.		
Average (N <sub>1</sub> ) <sub>60</sub> Value =	50	(consider D to D+2B)
Unit weight, γ =	125 pcf	

Seismic Data	S <sub>1</sub> =	NA
	F <sub>v</sub> =	NA
	S <sub>1</sub> F <sub>v</sub> =	0.652 Sa at 1 sec from CalTrans ARS Online
Design shear strain level, G/G <sub>0</sub> =	0.250	0.5 if FvS1 ≤ 0.3, 0.25 if FvS1 ≥ 0.5 Interpolate for other values

##### **Calculation of Initial/Low Strain Shear Modulus**

###### Method I - Using Measured Shear-Wave Velocity

$$G_0 = \frac{\gamma}{g} V_s^2 \quad G_0 = 2423878 \text{ psf} \\ 16832 \text{ psi}$$

###### Method II - Using Average (N<sub>1</sub>)<sub>60</sub> Value

Only to check - not used (Not reliable N-Values)

$$G_0 \cong 20,000 \sqrt[3]{(N_1)_{60}} \sqrt{\sigma_0} \quad G_0 = 1595658 \text{ psf} \\ (\text{calculated value is in psf}) \quad 11081 \text{ psi}$$

Effective stress at footing level,

$$\sigma'_0 = 469 \text{ psf}$$

Use

$$G_0 = 16832 \text{ psi}$$

**Page 1 of 3**

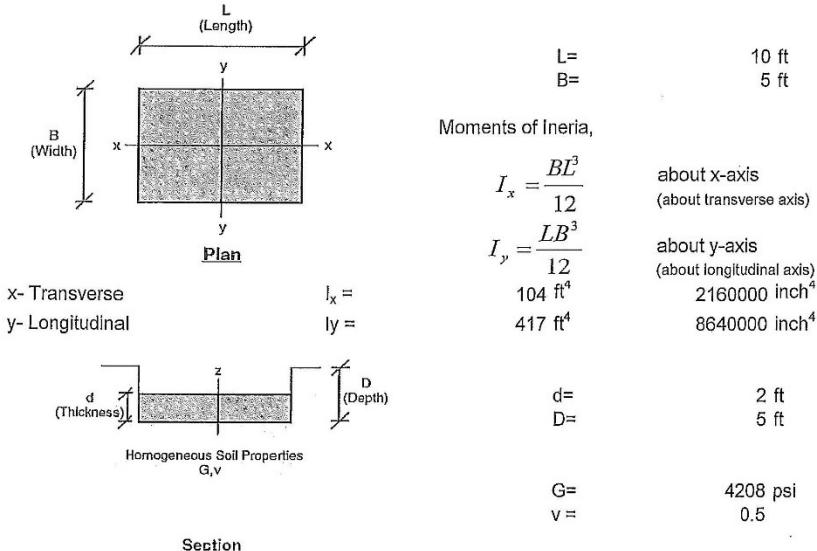
 Black Eagle Consulting, 1345 Capital Blvd, Suite A, Reno, NV 89502. ph.(775) 359-6600 fx.(775) 359-7766  
N:\projects\1724\01-1\calcs\Bridge Abutments Seismic Stiffness Values.xls

Then the shear modulus at the design strain levels,

$$G = 4208 \text{ psi}$$

$$G/G_0 = 0.250$$

### Stiffness Calculations



### Section

The uncoupled total embedded stiffness,

$$K_i = e_i K'_i$$

Where,

$K'_i$  is the rigid plate stiffness for various modes calculated by the equation from Table 1

$e_i$  is the embedment factors for various modes calculated by the equation from Table 2

Table 1

Stiffness Parameter	Rigid Plate Stiffness at Surface, $K'_i$
Vertical Translation, $K_z'$	$\frac{GL}{(1-v)} \left[ 0.73 + 1.54 \left( \frac{B}{L} \right)^{0.76} \right]$
Horizontal Translation, $K_y'$ (toward long side)	$\frac{GL}{(2-v)} \left[ 2 + 2.5 \left( \frac{B}{L} \right)^{0.85} \right]$
Horizontal Translation, $K_x'$ (toward short side)	$\frac{GL}{(2-v)} \left[ 2 + 2.5 \left( \frac{B}{L} \right)^{0.85} \right] - \frac{GL}{(0.75-v)} \left[ 0.1 \left( 1 - \frac{B}{L} \right) \right]$
Rotation, $K_{\theta x}'$ (about x axis)	$\frac{G}{(1-v)} l_x^{0.75} \left( \frac{L}{B} \right)^{0.25} \left( 2.4 + 0.5 \frac{B}{L} \right)$
Rotation, $K_{\theta y}'$ (about y axis)	$\frac{G}{(1-v)} l_y^{0.75} \left[ 3 \left( \frac{L}{B} \right)^{0.15} \right]$

Page 2 of 3



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N:\projects\1724\01-1\calcs\Bridge Abutments Seismic Stiffness Values.xls

**Table 2**

Stiffness Parameter	Embedment Factors, $e_i$
Vertical Translation, $e_z$	$\left[ 1 + 0.095 \frac{D}{B} \left( 1 + 13 \frac{B}{L} \right) \right] \left[ 1 + 0.2 \left( \frac{(2L+2B)}{LB} d \right)^{0.67} \right]$
Horizontal Translation, $e_y$ (toward long side)	$\left[ 1 + 0.15 \left( \frac{2D}{B} \right)^{0.5} \right] \left[ 1 + 0.52 \left( \frac{(D-d)}{2} \frac{16(L+B)d}{BL^2} \right)^{0.4} \right]$
Horizontal Translation, $e_x$ (toward short side)	$\left[ 1 + 0.15 \left( \frac{2D}{L} \right)^{0.5} \right] \left[ 1 + 0.52 \left( \frac{(D-d)}{2} \frac{16(L+B)d}{LB^2} \right)^{0.4} \right]$
Rotation, $e_{ox}$ (about x axis)	$1 + 2.52 \frac{d}{B} \left( 1 + \frac{2d}{B} \left( \frac{d}{D} \right)^{-0.20} \left( \frac{B}{L} \right)^{0.50} \right)$
Rotation, $e_{oy}$ (about y axis)	$1 + 0.92 \left( \frac{2d}{L} \right)^{0.60} \left( 1.5 + \left( \frac{2d}{L} \right)^{1.0} \left( \frac{d}{D} \right)^{-0.60} \right)$

$e_x = e_y$  per Gezetas (1991)  
 (original reference that the  
 equations of Table 1  
 and Table 2 were derived  
 from)  
 Equation for  $e_y$  is correct  
**Use  $e_x = e_y$**

**Calculated Stiffness Values:****Table 3**

Mode	$K'_i$	$e_i$ (no unit)	$K_i$
Vertical Translation	1682 kips/inch	2.100	3532 kips/inch
Horizontal Translation (Longitudinal Direction)	1140 kips/inch	2.292	2613 kips/inch
Horizontal Translation (Transverse Direction)	1039 kips/inch	2.292	2382 kips/inch
Rotation (about x-axis)	1.49E+06 kip-inch/rad	2.693	4.02E+06 kip-inch/rad
Rotation (about y-axis)	4.46E+06 kip-inch/rad	1.958	8.74E+06 kip-inch/rad

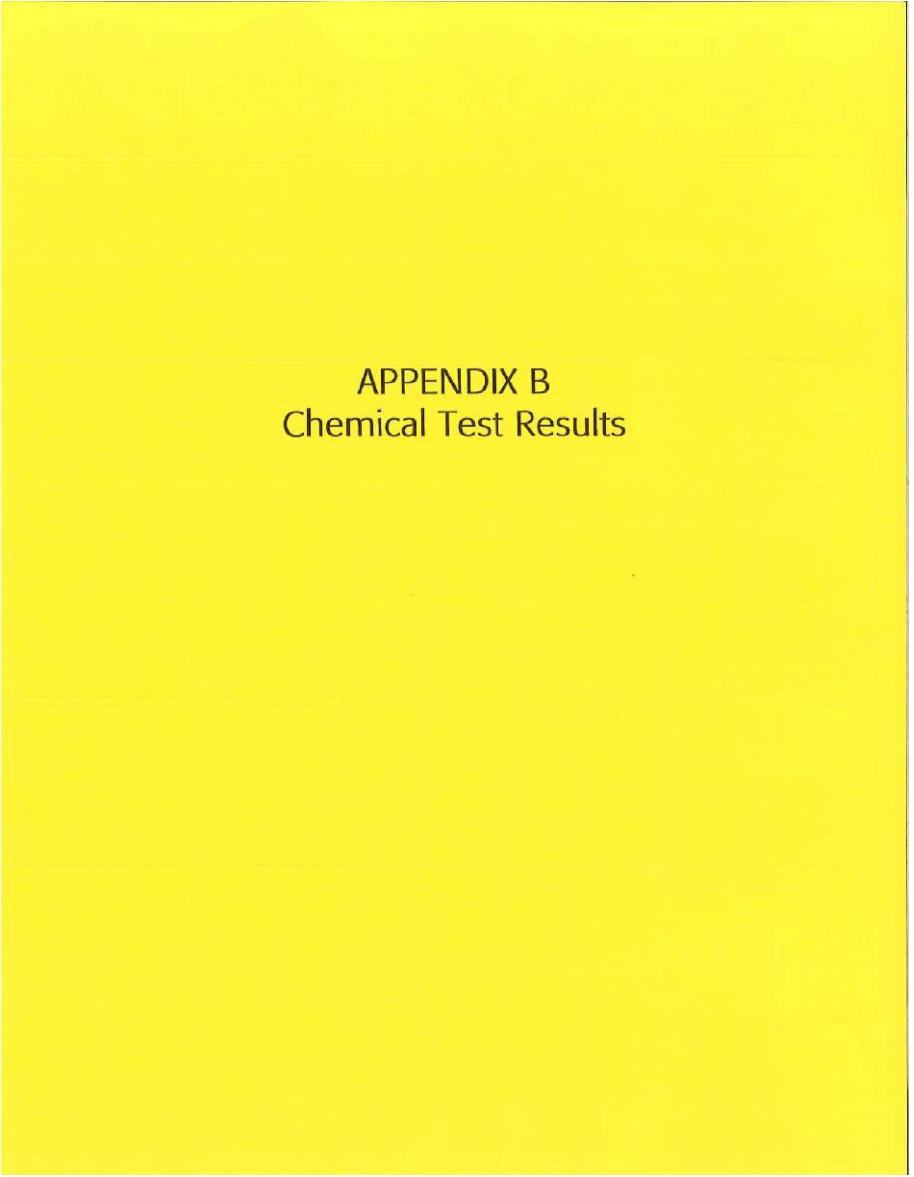
**Summary:**

$K_z$	3532 kips/inch	
$K_y$	2613 kips/inch	Longitudinal Direction
$K_x$	2382 kips/inch	Transverse direction
$K_{ox}$	4.02E+06 kip-inch/rad.	About Transverse Axis
$K_{oy}$	8.74E+06 kip-inch/rad.	About Longitudinal Axis

**Note:**

Longitudinal direction is parallel to bridge deck or perpendicular to skewed footings.  
 Transverse direction is perpendicular to bridge deck or parallel to skewed footings.





APPENDIX B  
Chemical Test Results



## Laboratory Report

Report ID: 132640

Sierra  
Environmental  
Monitoring, Inc.

Black Eagle Consulting, Inc.  
Attn: Pat Pilling  
1345 Capital Blvd., Suite A  
Reno, NV 89502-7140

Date: 1/27/2014  
Client: BEC-100  
Taken by: M. Wickes  
PO #:

### Analysis Report

#### Laboratory Accreditation Number

Laboratory Sample ID	Customer Sample ID			Date Sampled	Time Sampled	Date Received	
S201401-0583	1724-01-1 TP-01 C 9.5ft			1/15/2014	12:00 PM	1/15/2014	
Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
pH - Saturated Paste	SW-846 9045A	7.14	pH Units		Pacheco	1/20/2014	
pH - Temperature	SW-846 9045A	21.1	°C		Pacheco	1/20/2014	
Redox Potential	SM 2580 B	282	MV		Seher	1/24/2014	
Resistivity	EPA 120.1	48000	ohm cm		Faulstich	1/16/2014	
Sulfate - Ion Chromatography	EPA 300.0	5.3	mg/Kg	0.2	Faulstich	1/20/2014	
Sulfide	EPA 376.1	Negative	Pos/Neg	1	Seher	1/24/2014	

*Data Flag Legend:*

John Kobza, Ph.D  
*Laboratory Director*

Page 2 of 3  
1135 Financial Blvd.  
Reno, NV 89502-2348  
Phone (775) 657-2400  
Fax (888) 398-7002  
sem@semi-analytical.com

John C. Seher  
*Special Consultant*  
*Quality Assurance Manager*

# **APPENDIX H**

## Topographic Survey

To be provide upon request.

# **APPENDIX I**

## **General Specifications**

### **GENERAL SPECIFICATIONS OF PEDESTRIAN BRIDGE FOR GCSD**

Refer to Caltrans Standard Specifications 55 STEEL STRUCTURES

Add to section 55-1.02E(7)(c) Steel Pedestrian Bridges:

55-1.02E(7)(c)(i) General

55-1.02E(7)(c)(i)(A) Summary

Section 55-1.02E(7)(c) includes specifications for furnishing a prefabricated steel truss.

Furnish prefabricated steel truss includes designing, structural steel truss members, connection hardware and bolts, kick plates, safety rails and attachment hardware, expansion joint covers, railing, elastomeric bearings, sole plates, anchor bolts, nuts and washers, timber decking, and welding.

The prefabricated steel truss must be designed to the LRFD Guide Specifications for the Design of Pedestrian Bridges dated 2009, the AASHTO LRFD Bridge Design Specifications 6th Edition with Caltrans Amendments, Caltrans Seismic Design Criteria V1.7, and Caltrans Seismic Design Specifications for Steel Bridges, latest edition.

Welding must comply with Section 11.

Timber deck design must be performed by the bridge manufacturer.

Steel truss, timber decking and safety rail dimensions must be consistent with dimensions shown on the sample bridge. At completion of fabrication, submit a certificate of compliance stating that the prefabricated steel truss shop fabrication work complies with section 55 and as shown on the plans.

55-1.02E(7)(c)(i)(A)(1) Dimensions

55-1.02E(7)(c)(i) Width

Inside the clear width between safety rails must be: 8 feet 0 inches.

55-1.02E(7)(c)(i)(A)(2) Span

The trusses measured end to end of end posts must be 160 feet 0 inches.

55-1.02E(7)(c)(i)(A)(3) Camber

Camber: Camber truss provides a vertical camber dimension at mid-span equal to 100 percent of the full dead load deflection plus 1 percent of the full length of the truss.

The vertical truss members must be plumb after the bridge is erected and dead loads applied.

## **55-1.02E(7)(c)(i)(B) Definitions**

Not used.

## **55-1.02E(7)(c)(i)(C) Submittals**

Submit 3 shop drawings of the prefabricated steel truss, timber decking and safety rail to the GCSD Engineer. Submit 2 copies of the calculations certified by a licensed Civil or Structural engineer in the State of California. Include the submittal date and contents in the notification. Allow 30 days for the review. Submit 6 to 12 copies, as requested by the Engineer after review for final authorization.

The shop drawings must:

1. Be specific to this project
2. Show details and locations of temporary supports
3. Clearly show all member sizes and connections, all steel members must be identified as "Main Members", "Secondary Members", or "Primary Components of Main Members" per Caltrans Memo to Designers 12-2.
4. Include General Design Notes that list the appropriate design standards used
5. Include required minimum design loads
6. Show material specifications
7. Be certified by a registered Civil or Structural Engineer in the state of California

## **55-1.02E(7)(c)(i)(D) Quality Assurance**

Bridge fabricator must be certified by the American Institute of Steel Construction (AISC) to have the personnel, organization, experience, capability and commitment to produce fabricated structural steel for Conventional Steel Structures and Simple Steel Bridge Structures with both Major Bridge and Sophisticated Paint Endorsement as set forth in the AISC Certification Program.

At the completion of fabrication, the prefabricated steel truss shop fabricator must submit a certificate of compliance stating that work was performed in accordance with approved construction documents.

Welder qualification and inspection must comply with AWS D1.1.

## **55-1.02E(7)(c)(i)(E) Materials**

### **55-1.02E(7)(c)(i)(E)(1) General**

All structural members must have a minimum thickness of material of at least 1/4".

### **55-1.02E(7)(c)(i)(E)(2) Weathering Steel**

Fabricate trusses from ASTM A242, ASTM A709, Grade 50W, or ASTM A588 steel for plates and structural shapes, and ASTM A606 or ASTM A847 for tubular sections. Minimum yield (Fy) strength must be at least 50,000 psi.

Anchor assemblies must be A449 type 3, plain finish anchor bolts, A563-DH3, plain finish nuts, and F436 Type 3, plain finish washers.

Welding materials must comply with the American Welding Society (AWS) Structural Welding Code, D1.1. Filler metal as specified in 4.1 must be used for the particular welding process required. Welders must be certified under AWS D1.1.

**55-1.02E(7)(c)(i) (E)(3) Kick Plates**

Provide kick plates from weathering steel with a smooth inside surface with no protrusions.

**55-1.02E(7)(c)(i) (E)(4) Safety Rails**

Provide safety rails from weathering steel with a smooth inside surface with no protrusions.

**55-1.02E(7)(c)(i) (E)(5) Timber Decking**

The timber deck must be Ipe hardwood. Decking must be warrantied for 25 years against insect infestation and fungal decay. The supplier must be FSC certified, ensuring that the FSC-certified products come from responsibly managed sources.

Rough sawn wood is not permitted for the deck surface. Minimum deck plank width must be 5.5 inches or greater. Two fasteners must be used at each fastening line for each plank. Warped or cupped planks may be rejected at the discretion of the Engineer.

**55-1.02E(7)(c)(i)(F) Construction**

**55-1.02E(7)(c)(i)(F)(1) Fabrication**

Use E70 or E80 series electrodes. Use Flux Core Arc Welding (FCAW) or Shielded Manual Arc Welding (SMAW).

The connection of bridge end post to top chord must be a mitered joint with the exposed welds ground smooth. Grind smoothly all ends of angles.

Close ends of all tubes and grind smoothly.

Clean all exposed weathering steel surfaces of any surface contamination according to SSPC-SP1 (solvent cleaning) and blast cleaning according to SSPC-SP6 (commercial blast cleaning).

**55-1.02E(7)(c)(i)(F)(2) Delivery**

The contractor is responsible for securing hauling permits and freight charges.

Notify the GCSD Engineer in advance of the expected arrival time. Provide the GCSD information regarding delays after the trucks depart the plant, such as inclement weather, delays in permits, re- routing by public agencies or other circumstances. Deliver pedestrian bridge components during regular business hours (Mon-Thurs. 7am-5:30pm) to:

Graeagle Mill Pond, 1201 Blairsden Graeagle Rd Graeagle Ca 96103-1099.

Contact Christopher Ruedy at 415-902-4366 72 hours prior to delivery.

GCSD will not supply manpower and equipment to unload the delivered bridge at the Mill Pond staging area.

**55-1.02E(7)(c)(i)(F)(3) Erection**

Erection is included in this contract.

**55-1.02E(7)(c)(i)(F)(4) Limited Warranty**

Provide a warranty against defects in material and workmanship for a period of fifteen years.

**55-1.02E(7)(c)(i)(G) Payment**

Furnishing prefabricated steel truss includes payment for delivery to the site ready to

incorporate into the work.