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Final

Technical Specifications for North Fork Battle Creek Eagle Canyon Fish Passage Improvement Lower and Upper Barrier Sites

Prepared for

California Department of Fish and Wildlife
Agreement Number: D1499019

February 2017

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North Fork Battle Creek
Eagle Canyon Fish Passage Improvement
Lower and Upper Barrier Sites

The Technical Specifications noted below are complete and have been prepared by or under the direction of the following Registered Persons.

TECHNICAL PECIFICATIONS SECTIONS:

01 11 00	01 14 10	01 20 00	01 35 20	01 35 30	01 51 00
01 55 00	01 55 20	01 56 10	01 60 00	01 71 20	01 78 30
02 41 00	03 20 00	03 30 00	31 02 10	31 05 16	31 15 00
51 00 00	51 00 10	52 00 00			

2/28/17

REGISTERED CIVIL ENGINEER

MICHAEL LOVE, LICENSE NUMBER C71681

2/28/17

REGISTERED CIVIL ENGINEER

P. TRAVIS JAMES, LICENSE NUMBER C76663

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SECTION 01 01 00

DEFINITIONS AND ABBREVIATIONS

PART 1 GENERAL

1.1 SUMMARY

A. This Specification presents the definitions and abbreviations used for these Technical Specifications. Some definitions or abbreviations may have been omitted. Please contact the COR for any required clarification.

1.2 DEFINITIONS

A. Work: The effort required by the Contractor to complete the terms of this Contract.

1.3 ABBREVIATIONS

A. The following abbreviations apply to specifications Divisions 1 through 31:

1. CDFW: California Department of Fish and Wildlife
2. CE: Construction Engineer.
3. CO: Contract Owner.
4. COR: Contract Owner's Representative
5. ECDD: Eagle Canyon Diversion Dam
6. FERC: Federal Energy Regulatory Commission.
7. FPE: Fish Passage Engineer
8. JHA: Job Hazards Analysis
9. LBS: Lower Barrier Site
10. LO: Land Owner
11. NBCFDD: North Battle Creek Feeder Diversion Dam.
12. PG&E: Pacific Gas and Electric Company.
13. RSN: Required Submittal Number
14. UBS: Upper Barrier Site

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 11 00
SUMMARY OF WORK

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.1 LOCATION

A. Work is located at two different sites within Eagle Canyon, North Fork Battle Creek, California. The Lower Barrier Site is located approximately 700 feet downstream of the Eagle Canyon Diversion Dam. The Upper Barrier Site is located approximately 800 feet upstream of the Eagle Canyon Diversion Dam, which is approximately 3 miles west of Manton, California, in Tehama County. The Lower Barrier Site is located on the county line separating Tehama and Shasta County. The Upper Barrier Site is located in Shasta County next to the county line. Access to the Upper Barrier Site may be from land within Tehama County.

1.2 PRINCIPAL COMPONENTS OF WORK

A. Lower Barrier Site:
   1. Site Preparation
      a. Vegetation removal during winter
      b. Mobilization
      c. Develop access and Contractor Use Areas
      d. Site stabilization
      e. Install temporary facilities for clear water diversion and dewatering
   2. Earthwork:
      a. Demolition and excavation of earth and rock materials
   3. Site Withdrawal
      a. Demobilization
      b. Remove temporary facilities
      c. Restoration

B. Upper Barrier Site:

1. Site Preparation
    a. Vegetation removal during winter
    b. Mobilization
    c. Develop access and Contractor Use Areas
    d. Site stabilization
    e. Install temporary facilities for clear water diversion and dewatering.
2. Earthwork:
    a. Demolition and excavation of earth and rock materials.
    b. Construction of new channel from existing boulders and boulder fragments.
3. Concrete:
    a. Construction of in-channel weirs
4. Site Withdrawal
    a. Demobilization
    b. Remove temporary facilities
    c. Restoration

1.3 SUMMARY OF WORK

A. Lower Barrier Site:

1. The objective of the Work is to remove existing boulders from the channel to create a larger, in-channel pool and to remove rock, including potentially bedrock, to create two rock chutes to improve fish passage conditions. The largest boulders to be removed are tens of feet in diameter and will need to be fragmented to remove them. Breaking boulders will be completed by approved methods.

   Removing boulders from Eagle Canyon will be executed from the Eagle Canyon Rim; large equipment (e.g. excavator) will be difficult to deliver to the work area and likely infeasible. It may be feasible to deliver smaller equipment (e.g. mini excavator) to the channel.

B. Upper Barrier Site:

1. The objective of the Work is to remove boulders and reconfigure the channel using existing boulders to improve fish passage conditions. The largest existing boulders are tens of feet in diameter and will need to be fragmented to move them. Fragmenting boulders will be completed by approved methods. A selection of the existing boulders or boulder fragments will be used to reconstruct the channel. The Fish Passage Engineer will work closely with the Contractor to determine which boulders should be used for reconstruction. It is likely that the contractor will need to move existing boulders (or boulder fragments) from their current position and

stockpile them until the channel reconstruction phase. It will be critical that no boulder is removed or modified without agreement among the Fish Passage Engineer and the Contractor. Whenever possible to meet the design intent, using an existing boulder in-situ will be preferred over moving a boulder (fragment) and then returning it to reconstruct the channel. Some in-situ boulders may require modification to achieve the design intent.

Included in the Contract Drawings is a Conceptual Design Drawing detailing a finished grade based on the information available during design. This conceptual design is for reference purposes. The existing conditions below the visible surface are unknown and so deviations from the conceptual design should be expected.

Reconstructing the channel will require planning and field adjustments, requiring open communication between the Fish Passage Engineer and the Contractor to achieve project success. The constructed boulder and bedrock hydraulic control structures must meet the design elevations as defined in the Contract Drawings, per the allowed tolerances. Placement of each boulder may require several attempts to meet design elevations. It will be necessary for the Contractor to select a construction approach that provides flexibility for this Work.

Boulders and boulder fragments removed from the Upper Barrier Site and not used to reconstruct the channel shall be removed from the site.

In addition to the channel reconstruction, two concrete weirs will be installed as shown on the Drawings. The intent of this structure is to deflect low flows.

1.4 SPECIFICATIONS REQUIREMENTS

A. Imperative statements in these specifications are Contractor requirements, unless otherwise stated.

B. Where specifications are written in streamlined form, the words “shall be” are included by inference where a colon (:) is used within the sentence or phrase.

1.5 DEFINITIONS

1.6 ACRONYMS

A. The following acronyms apply to specifications Divisions 1 through 31:

1. CDFW: California Department of Fish and Wildlife
2. CE: Construction Engineer.
3. CO: Contract Owner.
4. COR: Contract Owner’s Representative

5. ECDD: Eagle Canyon Diversion Dam
6. FERC: Federal Energy Regulatory Commission.
7. FPE: Fish Passage Engineer
8. JHA: Job Hazards Analysis
9. LBS: Lower Barrier Site
10. LO: Land Owner
11. NBCFDD: North Battle Creek Feeder Diversion Dam.
12. PG&E: Pacific Gas and Electric Company.
13. UBS: Upper Barrier Site

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 14 10

USE OF SITE

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 REFERENCE STANDARDS

A. Current Caltrans' Storm Water Quality Handbook

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 14 10-1, Site Use Plan
   1. Show location and extent of impact of anticipated site use. Uses include but are not limited to the following:
      a. Buildings and service areas including offices, shops, warehouses, storage areas, fuel and oil storage areas, and fabrication yards.
      b. Parking areas, temporary roads, and access trails.
      c. Areas for processing, storing, and disposing of waste materials from construction operations.
      d. Utilities including air, power, and water lines; fire suppression; and compressor station.
      e. First-aid facilities.
      f. Temporary fences.
   2. Describe construction access option selected for both sites, see Contract Drawings. If the Contractor selects to apply another method, please describe the method in detail and provide support drawings.
   3. Describe methods to protect environmentally sensitive species, see Section 01 57 66, Environmental Protection of Species and Habitats.
   4. Describe Clearing and Grubbing methods and stockpiling methods and provide maps of where activities will occur, see Section 31 11 00 Clearing and Grubbing.
   5. Describe methods to preserve, protect, and repair if damaged, trees, shrubs, grass, and other landscape features on or adjacent to jobsite, which are not to be removed and which do not interfere with the Work. Include methods to mark

Work area limits, protect disturbed areas, and prevent erosion.

6. Describe methods to be used to prevent introduction of noxious weeds and invasive species.

7. Describe methods to protect, and repair if damaged, existing improvements and utilities at or near the jobsite.

8. Describe methods for removing temporary structures and facilities, cleanup, and rehabilitating the site after completion of construction activities.

9. Submit revised drawings of changes in use of land made during design and erection stages or after use of land is in operation.

C. RSN 01 14 10-2, Video recording of pre-project conditions.

D. RSN 01 14 10-3, 10 copies of keys for gate locks.

E. RSN 01 14 10-4, Access Infrastructure Shop Drawings.

1. If the Contractor selects to construct access infrastructure, then the Contractor must submit Shop Drawings of the proposed infrastructure for approval by the COR and PG&E if the proposed infrastructure is adjacent to their existing facilities.

1.4 PROJECT CONDITIONS

A. Location, construction, operation, maintenance, and removal of construction facilities will be subject to approval of the COR.

B. Construction limits are three feet from edge of excavation or backfill unless otherwise indicated on drawings or approved by COR.

C. Approximate limits and location of Contractor Use Areas are shown on the drawings. The Contractor will stake these limits and adjust them to minimize environmental impacts. COR must approve the limits prior to utilizing the Contractor Use Areas.

D. Install environmental protective measures as specified.

E. Location, construction, operation, maintenance, and removal of construction facilities will be subject to approval of COR.

F. When private land is used for construction facilities or other construction purposes, that has not already been approved through CO and LO negotiations, make necessary arrangements associated with use of private land.

1. Obtain written agreement with landowners before start of construction.

a. Describe existing condition of private land use areas.

b. Detail agreed-to repairs or improvements following end of construction.

c. Submit a signed written agreement to COR.

2. Upon completion of construction,

a. Make agreed-to repairs or improvements as detailed in written agreement.

b. Provide written LO release from agreement to COR

G. Do not interfere with work of other contractors, PG&E, or landowners.

H. Provide temporary fences and cattle guards as required to protect livestock from injury and prevent livestock from entering worksites, roads, and use areas.

I. Existing access roads may be used in accordance with Section 01 55 00 - Vehicular Access and Parking.

J. Housing for construction personnel will not be permitted, except housing for guards or watchmen as may be approved by COR.

K. During working hours, prevent access by unauthorized personnel. Control access by either of following methods:

1. Keep gates closed and locked at all times except when immediately entering or exiting worksites.
2. When gates are open to facilitate operations, provide a security watchman at each open gate to control access and prevent access by unauthorized personnel.

L. Before leaving worksites at end of workday, ensure that access points are securely locked.

M. Provide and install suitable heavy-duty locks and other materials required to lock existing gates.

1. Locks and methods of attaching locks to existing gates will be subject to approval by COR.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 ACCESS

A. For access to the South Rim, follow PG&E's access protocol. Contact PG&E for protocol:

PG&E Manton Service Center, Attn: Kelly Lindblom, 31295 Manton Road,

P.O. Box 409, Manton, CA 96059.

B. The Contractor may elect to improve access. All access infrastructure must be removed at the end of construction.

C. All temporary access infrastructure adjacent to PG&E existing infrastructure must be reviewed and approved by PG&E and the COR.

D. PG&E has stated that they would prefer that any temporary infrastructure apply minimal loads on their facility.

3.2 RECORDS

A. Make preconstruction video of pre-project conditions including surface conditions of roads that will be used during construction for haul routes, disposal areas, parking areas, and other uses and staging areas, access points, and access trails.

   a. DVD format with a minimum 720 pixel resolution.

   b. Label:

      i. Contract number and title.

      ii. Contractor's name.

      iii. Date recording is made.

      iv. Preface video with this information.

   c. COR will be present during recording. Notify COR at least 3 days prior to recording.

3.3 CLEANING

A. Construction Equipment:

   1. Before bringing on site, clean construction equipment to remove dirt, vegetation, and other organic material to prevent introduction of noxious weeds, and invasive plant and animal species.

   2. Contractor cleaning procedures shall result in equipment being cleaned as well or better than the procedures described in Caltrans' Storm water Quality Handbooks, NS-8.

   3. The COR will inspect construction equipment before allowing the equipment onsite.

3.4 RESTORATION

A. After completion of work, regrade and scarify land used for construction purposes and not required for completed installation so that surfaces blend with natural terrain and are

in a condition that will facilitate revegetation, provide proper drainage, and prevent erosion.

B. Seed disturbed areas used for construction purposes and not required for completed installation in accordance with Section 32 92 20 - Revegetation.

C. Perform final grading, restoration and other conditions for areas used for disposal of excess excavated materials in accordance with Section 31 23 90 - Disposal of Excavated Materials.

D. Restore Contractor use areas to pre-construction condition.

END OF SECTION

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SECTION 01 20 00
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Specification Section presents measurement and payment details.

1.2 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 20 00-1, Schedule of Values:

1. Within ten Days from issuance of Notice of Award and prior to the Contractor beginning construction activities, the Contractor must submit a Schedule of Values.

2. Within the Schedule of Values, the Contractor must identify the different components (e.g. labor, equipment) to be used to complete the Work so the CO understands the component costs for each of the Bid Schedule line items. The approved Schedule of Values will be the basis for developing progress payments.

3. The sum of the components for each Bid Item must match the Bid Schedule line item total cost as submitted by the Contractor. The Bid Items descriptions are presented below.

4. Contractor's overhead, profit, insurance, cost of bonds (except to the extent expressly identified in a Bid Item) and/or other financing, as well as "general conditions costs," shall be prorated through all activities so that the sum of all the Schedule of Values line items equals Contractor's total Contract Sum, less any allowances designated by CO. Scheduling, record documents and quality assurance control shall be separate line items.

5. The CO will review the component costs to ensure that the dollar amounts of the Schedule of Values are, in fact, fair market cost allocations. Upon favorable review by the CO, the CO will accept the Schedule of Values for use. The CO shall be the sole judge of fair market cost allocations.

6. The CO will reject any attempt to increase the cost of early activities, i.e., "front loading," resulting in a complete reallocation of moneys until such "front loading" is corrected. Repeated attempts at "front loading" may result in suspension or termination of the Work for default, or refusal to process progress

payments until such time as the Schedule of Values is acceptable to the CO.

1.3 DEFINITIONS

A. Unit Price Work

1. The CO will verify the quantities of work to be paid for any item for which a unit price is fixed in the Contract. The foregoing shall also apply to Bid Items for which the unit of measurement is designated as "Each".

2. Unless otherwise provided, determination of the number of units of work so completed will be based, so far as practicable, on the actual measurement or count made by the CO of the work satisfactorily completed within the prescribed limits.

B. Lump Sum Work:

1. When the estimated quantity for specific portions of work is not indicated on the Bid Schedule and unit is designated as lump sum, payment will be on a lump sum basis in accordance with the approved Schedule of Values, for work satisfactorily completed.

C. Allowance Items are individually set aside, fixed dollar amounts available for selected items of work and/or materials that may be performed and/or procured only when and as directed in writing by the CO, and shall be limited to items of work properly inferable from the description of the allowance.

1. The dollar amount given in the Bid Schedule for each allowance item shall be the amount of funds set aside for each allowance. Said amounts shall be included in Contractor's Total Bid on the Schedule of Bid Prices.

1.4 PROGRESS ESTIMATES AND PAYMENTS

A. See the General Conditions for special provisions related to progress payments and payment schedule.

1.5 DESCRIPTION OF BID SCHEDULE LINE ITEMS

A. Any work not specifically mentioned/described in the following bid items will be paid under Bid Item 2.

B. <u>Item 1 – Mobilizations and Demobilizations</u>
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item covers all Contractor costs and effort associated with mobilizing

equipment, materials, and labor to the project site as well as demobilization from the project site. This item includes, but are not limited to, bonds, insurance, contracting and administrative and permitting costs, submittals (unless specifically included in another Item), equipment mobilization/demobilization to the work areas, temporary facilities and utilities, punch list items, repairs of damaged property, site cleanup, record documents, and project maintenance and warranty.

This Item also covers all Contractor costs and effort associated with providing traffic control as described in these Specifications, the Plans, and Contractor obtained encroachment permit. Items covered by this include, but are not limited to, labor, materials, equipment, and other expenses for complete traffic control throughout the length of the project including times when the Contractor is not working on site. Included are notifications, road closures and detours, flaggers as necessary, and all other materials and equipment needed to temporarily control traffic throughout the project.

C. Item 2 – SWPPP/Environmental Requirements
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item covers the development of a Storm Pollution Prevention Plan (SWPPP); water quality testing; Spill Prevention, Control, and Countermeasure (SPCC) Plan; Erosion Sediment Control Plan (ESCP); installation of Best Management Practices (BMPs) erosion control measures, and to obtain additional permits as presented in these Specifications. This Item also covers the costs for Contractor and Subcontractor staff to attend environmental training. This Item also covers the installation, maintenance and removal of environmental controls (e.g. tree/vegetation preservation fencing, erosion control, exclusionary fencing, fire tools and dust control measures).

D. Item 3 – Clear & Grub
Measurement for this item will be on a Lump Sum basis. This Item includes removal and disposal of existing vegetation as specified in these Specifications, Drawings and Permits.

E. Item 4 – Canyon Stabilization for Construction Safety
Measurement for this item will be on a Lump Sum basis. This item includes canyon rock fall mitigation for construction safety for both sites as specified in Section 31 15 00. This Item does not include the removal of rock material generated by site stabilization activities.

F. Item 5 - Lower Barrier Site Access and Preparations
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for developing access to the Lower Barrier Site (LBS) and preparation of Contractor Use Areas as presented in these Specifications, Drawings, and per the Permit requirements.

G. Item 6 – Lower Barrier Site Clear Water Diversion and Dewatering
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for installing, maintaining, and removing clear water diversion and dewatering facilities for the LBS. This item also includes removal and relocation of aquatic organisms by a qualified fisheries biologist.

H. Item 7 – Lower Barrier Site Rock Demolition, Removal, and Channel Modifications
Measurement for this item will be on a Ton basis. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for in-channel rock demolition, rock removal, and channel modifications for the LBS. This Item does not include the work associated with site stabilization. This Item does include the removal of any rock generated by the site stabilization as approved by the COR. The measurement will be based on a mutually agreed upon method defined in the approved Schedule of Values and confirmed by the COR.

I. Item 8 – Lower Barrier Site Restoration
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for site stabilization, restoration and revegetation of the LBS as specified in these Specifications, Drawings, and per the Permit conditions.

J. Item 9 – Upper Barrier Site Access and Preparations
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for developing access to the Upper Barrier Site (UBS) and preparation of Contractor Use Areas as presented in these Specifications, Drawings, and per the Permit requirements. This Item also includes the work associated with stabilizing the UBS, as specified in Section 31 15 00 of these Specifications. This Item does not include the removal of rock material generated by site stabilization activities.

K. Item 10 – Upper Barrier Site Clear Water Diversion and Dewatering
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for installing, maintaining, and removing clear water diversion and dewatering facilities for the UBS. This item also includes removal and relocation of aquatic organisms by a qualified fisheries biologist.

L. Item 11 – Upper Barrier Site Rock Demolition and Removal
Measurement for this item will be on a Ton basis. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for in-channel rock demolition, rock removal, and channel modifications for the UBS. This Item does not include the work

associated with site stabilization. This Item does include the removal of any rock generated by the site stabilization as approved by the COR. The measurement will be based on a mutually agreed upon method defined in the approved Schedule of Values and confirmed by the COR.

M. Item 12 – Upper Barrier Site Channel Construction
Measurement for this item will be by Force Account. The measurement will follow the Caltrans method for Force Account accounting as presented in the Caltrans Construction Manual current at the time when the Work is being executed. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for reconstructing the channel to finish grade at the UBS. This Item does not include the work associated with removal of rock from Eagle Canyon or modification of existing boulders and bedrock (these items are included under Item 9). This Item does include the placement of existing boulders to construct the finished channel.

N. Item 13 – Upper Barrier Site In-Channel Concrete Weir Construction
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for installation of the two UBS concrete weirs specified in these Specifications, Drawings, and per the Permit conditions.

O. Item 14 – Upper Barrier Site Restoration
Measurement for this item will be on a Lump Sum basis. Payment shall correspond to percent complete as confirmed by the COR as it relates to the approved Schedule of Values. This Item includes, but is not limited to, labor, materials, equipment, and other expenses for site stabilization, restoration and revegetation of the UBS as specified in these Specifications, Drawings, and per the Permit conditions.

PART 2 - PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 33 00
SUBMITTALS

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 REFERENCE STANDARDS

A. American Society of Mechanical Engineers (ASME)
   1. ASME Y14.1-2005(2012) Decimal Inch Drawing Sheet Size and Format

B. National Institute of Building Sciences (NIBS)
   1. NIBS NCS-14 United States National CAD Standards, Version 6

1.3 DEFINITIONS

A. Days: Calendar days.

B. Required Submittal Number (RSN): Identifies items to be submitted together as a complete submittal.

1.4 SUBMITTAL REQUIREMENTS

A. In case of conflict between requirements of this section and requirements included elsewhere in these specifications, requirements included elsewhere take precedence.

B. General:
   1. Prepare in English.
   2. Label with contract number and title, and RSN.
   3. Measurement Units: US Customary Units.

C. Drawings:
   1. Minimum Identification in Title Block:
      a. Contract number and title.
      b. Contractor’s or supplier’s title and drawing number.
      c. Date.

2. Reserve 3- by 3-inch space next to title block for review stamps.
3. Size: D size (22 inches by 34 inches) as defined by ASME Y14.1.
4. Draw to scale using computer drafting or drafting equipment, unless otherwise specified.
    a. Computer drafted drawings:
        1) In accordance with NIBS NCS.
        2) Electronic file format: Compatible with AUTOCAD, Version 2012 or later.
        3) Compile using “eTransmit” utility in AUTOCAD.
    b. Drawing prepared with drafting equipment, when allowed: Lettering shall be neat.
5. Electronic files: On CD, DVD discs or through a secure file transfer protocol (or similar file transfer mechanism).

D. Product Data:
1. Mark manufacturer's data for commercial products or equipment, such as catalog cut sheets.
    a. Identify manufacturer's name, type, model, size, and characteristics.
    b. Illustrate that product or equipment meets requirements of specifications.
    c. Mark items to be furnished in a manner that will photocopy (no highlighter).
    d. Strike through items that do not apply.

E. Certifications:
1. Certifications by a registered professional: Signed and sealed by a State of California registered professional.
2. Manufacturer’s certifications: Signed by authorized representative of manufacturer.

F. Manuals:
1. Copies:
    a. Printed copies: Bound and indexed.
    b. Electronic copies: Adobe .pdf on CD or DVD discs.
        1) Bookmark longer files to assist in navigating file.
2. Contents:
    a. Parts identification lists, lists of special tools, and accessories.

b. Schematics and wiring diagrams.

c. Detailed instructions for installing, operating, lubricating, and maintaining equipment.

d. As-built drawings, photographs, and test records or reports if required by the specifications.

1.5 SUBMITTALS PROCEDURES

A. Submit only Contractor reviewed submittals. Submittals without evidence of Contractor's approval will be returned for resubmission.

B. Submit complete sets of required materials for each RSN as specified in "Submittals Required" column in Table 01 33 00A - List of Submittals. A complete set includes all listed items for RSNs with multiple parts.

C. Submit number of sets specified in "No. of sets to be sent to:" columns in Table 01 33 00A - List of Submittals.

D. Include the following information in transmittal letters.

1. RSN for each attached submittal.
2. Responsible Code.
3. Number of sets for each RSN.
4. Identify submittal as initial or resubmittal. If a resubmittal, append a capital alpha character to the RSN beginning with "A" for the first resubmittal and "B" for the second, etc.

E. Resubmittal of submittals not approved or accepted.

1. Mark changes such that they are readily identifiable and show revision date.
2. Describe reasons for significant changes in transmittal letter.
3. Resubmit returned submittals within 14 days after receiving the comments, unless otherwise directed.
4. Requirements for initial submittals apply to resubmittals.

F. More than one RSN may be submitted under a transmittal letter, provided the responsible code is the same.

1.6 REVIEW OF SUBMITTALS

A. Time Required:

1. The Responsible Code party will require 21 days for review of each

submittal or resubmittal, unless otherwise specified.

2. Time required for review of each submittal or resubmittal begins when complete sets of materials required for a particular RSN are received and extends through return mailing postmark date.

3. It is the Contractor's responsibility to ensure that the Responsible Code party has received the submittal.

4. More than 5 submittals submitted within one week shall be prioritized by the Contractor and additional time will be required for the review process. Seven days will be added to review time for each submittal submitted over the 5 submittal limit.

B. Time in Excess of Specified:

1. The CO may extend the contract completion date to allow additional time for completing work affected by excess review time.

   a. The time extension will be to the extent that excess review time caused delay to the contract completion date.

   b. The time extension will not exceed the time used in excess of the specified number of days for review of submittals or resubmittals.

   c. Concurrent days of excess review time resulting from review of two or more separate submittals or resubmittals will be counted only once in extending the contract completion date.

2. No time extension will be allowed if the Contractor fails to make complete submittals in sequence and within time periods specified.

3. Adjustment for delay will be made only to the extent that:

   a. Approval/acceptance was required under the contract, and

   b. Requests for approval/acceptance were properly and timely submitted and were approved/accepted.

C. Return of Submittals:

1. Return of submittals will be electronic or hard copy, as applicable.

2. One set of submittals required for action will be returned either approved, approved subject to identified changes, not approved, accepted, conditionally accepted, not accepted, or incomplete.

   a. Revise and resubmit submittals not approved or not accepted.

   b. Do not change designs without approval of the CO after drawings, documentation, and technical data have been approved.

1.7 TRANSMITTALS

A. Transmittal of hard copies to addresses for codes listed in Table 01 33 00A - List of Submittals:

1. CO or COR: ADDRESS <Update once CO or COR is known>

2. Pacific Gas and Electric (PG&E): Send one set to each of the PG&E addresses below:
   a. PG&E Manton Service Center, Attn: Rob Bowers, 31295 Manton Road, P.O. Box 409, Manton, CA 96059.
      1) Express Mail: 31295 Manton Road, Manton, CA 96059.
   b. PG&E Battle Creek Restoration Project, Attn: Kevin Gilton, 10995 Gold Center Drive, Suite 100, Rancho Cordova CA 95670.
   c. PG&E Manton Service Center, Attn: Kelly Lindblom, 31295 Manton Road, P.O. Box 409, Manton, CA 96059.

B. Send original transmittal letter with appropriate number of sets to office listed in "Responsible Code" column in Table 01 33 00A – List of Submittals.

C. Send copy of transmittal letter with appropriate number of sets to offices that are not the responsible code, but show "No. of sets to be sent to" in Table 01 33 00A – List of Submittals.

D. When "No. of sets to be sent to" is 0, send a copy of transmittal letter to that office.

E. Submittals required by the specifications, but not listed in Table 01 33 00A - List of Submittals:

1. Submit in accordance with this section.

2. Submit to CE, unless otherwise specified.

F. Facsimile transmissions of RSN's are not acceptable, unless specifically stated herein.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

RSN	Section Title	Submittals Required	Due Date or Delivery Time	R-Code	No. of sets to be sent to:	
					COR	PG&E
01 14 10-1	Use of Site	Site Use Plan	To be determined by CO once selected	COR	To be determined by CO once selected	To be determined by CO once selected
01 14 10-2	Use of Site	Video Recording of Pre-Project Conditions		COR		
01 14 10-3	Use of Site	Copy of gate lock keys		COR		
01 14 10-4	Use of Site	Access Infrastructure Shop Drawings		COR		
01 20 00-1	Measurement & Payment	Schedule of Values		COR		
01 35 20-1	Safety and Health	Contractor Safety Program		COR		
01 35 30-1	Safety and Health	Safety Inspection Reports		COR		
01 51 16-1	Fire Protection	Fire Protection and Prevention Plan		COR		
01 55 20-1	Traffic Control	Traffic Control Plan		COR		
01 57 30-1	Water Pollution & Erosion Control	General Permit - Notice of Intent		COR		
01 57 30-2	Water Pollution & Erosion Control	General Permit -Qualifications and Certifications		COR		
01 57 30-1	Water Pollution & Erosion Control	Storm Water Pollution Prevention Plan		COR		
01 57 30-4	Water Pollution & Erosion Control	Spill Prevention, Control, and Countermeasure (SPCC) Plan		COR		

01 57 30-5	Water Pollution & Erosion Control	Erosion and Sediment Control Plan		COR		
01 57 30-6	Water Pollution & Erosion Control	Water Quality Monitoring		COR		
01 57 50-1	Tree and Plant Protection	Arborist Qualifications		COR		
01 71 20-1	Surveying	Surveyor Resume		COR		
01 71 20-2	Surveying	Electronic Data Files		COR		
01 78 30-1	Project Record Documents	Final As-Built Drawings		COR		
02 41 00-1	Demolition	Demolition Plan		COR		
02 41 00-2	Demolition	Controlled Blasting Plan		COR		
02 41 00-3	Demolition	Video Recording of Blasts		COR		
02 41 00-4	Demolition	Vibration and Monitoring Reports		COR		
02 41 00-5	Demolition	Postblast Reports		COR		
02 41 00-6	Demolition	Blasting Complaints		COR		
03 30 00-1	Cast-In-Place Concrete	Concrete Design and Strength Data		COR		
03 30 00-2	Cast-In-Place Concrete	Concrete Supplier		COR		
31 03 10-1	Clear Water Diversions	Aquatic Biologist Qualifications		COR		
31 03 10-2	Clear Water Diversions	Clear Water Diversion Plan		COR		
31 03 33-1	Dewatering	Dewatering Plan		COR		

31 15 00-1	Canyon Stabilization for Construction Safety	Stabilization Plan		COR		
31 23 90-1	Disposal of Materials	Disposal Site Details		COR		
32 92 20-1	Revegetation	Resume		COR		
32 92 20-2	Revegetation	Seeding Plan		COR		
32 92 20-3	Revegetation	Certifications		COR		
32 92 20-4	Revegetation	Mycorrhizal Inoculum Information and Certifications		COR		
32 92 20-5	Revegetation	Fertilizer, Hydromulch and stabilizers, Mulch Neeting, and Anchors		COR		

END OF SECTION

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SECTION 01 35 20

SAFETY AND HEALTH

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 REFERENCES STANDARDS

A. Occupational Safety and Health Administration (OSHA)
   1. 29 CFR Part 1910 OSHA General Industry Standards
   2. 29 CFR Part 1926 OSHA Construction Industry Regulations
   3. Available online at: https://www.osha.gov/.

B. Applicable State Safety and Health Regulations – CAL/OSHA
   1. California Code of Regulations (CCR) Title 8
   2. Available online at: https://www.dir.ca.gov/title8/index/T8index.asp.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 35 20-1, Contractor Safety Program:
   1. Written Safety Program in accordance with CAL/OSHA.
   2. Cover all aspects of on site and applicable off site operations and activities associated with this Contract.
   3. Program must follow the format of the attached outline at a minimum, additional sections and subsections may be added if needed.
   4. Will not be accepted for review by the COR unless it addresses, in order, lettered and numbered per the attached outline, a narrative for each applicable item in the outline.
      a. For items in the outline that do not apply to this contract write “Not Applicable to Contract” next to the number/letter.
   5. A generic Company Safety Plan is not acceptable. The Safety Program must be site specific for this contract.
   6. The Contractor’s Safety Program must be submitted and accepted by COR prior to commencing on site work.

1.4 SAFETY AND HEALTH

A. Do not allow Contractor employees (including subcontractors) or the Public to be exposed to, or work under, conditions which are unsanitary, physically hazardous, or a potential exposure danger to their health or safety during performance of the Contract.

B. Under no circumstances will onsite work, including mobilization, be permitted until the Contractor Safety Program has been accepted by the COR.

C. Fully participate in a Contractor Safety Program review meeting, prior to mobilization. If applicable, include subcontractor management representatives.

D. The minimum work crew at any time on the construction site shall consist of no less than two people and shall be in accordance with other contractual obligations.

E. Develop Job Hazard Analysis (JHA) for each distinct phase of work under the contract.

1. Work shall not begin on the phase of work until a JHA is acceptable to COR and shared with all construction employees.
2. Activities involving hazardous materials shall have the appropriate Safety Data Sheet(s) attached to the JHA.

F. Contractor's responsibility applies to all operations, including those of the Contractor's Subcontractors.

G. When violations of safety and health requirements contained in these specifications or referenced standards are called to the Contractor's attention by the CO or the COR, immediately correct the condition to which attention has been directed.

H. Either oral or written notice shall be deemed sufficient.

I. When the Contractor fails or refuses to promptly correct a compliance directive, the CO or the COR may issue an order to stop all or any part of the work.

1. When satisfactory corrective action is taken, an order to resume work will be issued by the COR.
2. The Contractor shall not be entitled to extension of time, nor to claim for damage or to additional compensation by reason of either the directive or the stop order.
3. Failure of the CO or the COR to order discontinuance of any or all of the Contractor's operations shall not relieve the Contractor of the responsibility for the safety of personnel and property.

J. Maintain an accurate record of, and report to the COR in the manner prescribed by the CO for all near misses, accidents or incidents, occupational diseases, traumatic injury, cases of death to Contractor employees (including subcontractors), or the Public, and any property damage occurring during the performance of work under this contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 FACILITIES

Provide sanitary facilities and first aid kit according to OSHA regulations.

CONTRACTOR SAFETY PROGRAM OUTLINE

Below sections are too be discussed in detail as to how they relate to this Project specifically. If the Contractor feels that a section is not applicable to this Project, then provide written reasoning as to why the section is not applicable.

I. General Requirements

A. Statement of Safety and Health Responsibilities
B. Statement of Compliance with Regulations, Standards, and Codes
C. Statement of Subcontractor Compliance
D. Safety Inspection Procedures
E. Accident Investigation and Reporting Procedures
F. Applicable Emergency Plans
G. Confined Space Procedures
H. Lockout/Tagout Procedures
I. Rock Fall Protection Procedures
J. Fire Protection Plans (Contractor can cross-reference Fire Protection and Prevention Plan, once approved)

II. Medical

A. Facilities – identify nearest facilities.
B. Training – identify training specific personnel or job titles have and training programs to be put in place as part of this Project
C. Certifications – identify training certifications for specific personnel or job titles.
D. Ambulance - Name, location, and telephone number
E. Physical Qualification of Employees

III. Communications

A. Employee Training
B. Safety Meetings
C. Onsite Training
D. Supervisor Training

IV. Occupational Health

A. Procedures and Equipment to Minimize Hazards
B. Testing program for employees and work environments
C. Qualified personnel
D. Personal protective equipment
E. Ventilation plans

V. Machinery and Mechanical Equipment

A. Procedures and Equipment to Minimize Hazards
    1. Testing program for employees and work environments
    2. Mobile and stationary equipment
B. Inspection Procedures
C. Maintenance Procedures

D. Operating Personnel
E. Protective Safety Devices
F. Elevators and Aerial Lifts

VI. Excavation and Demolition (May reference Demolition Plan, see Section 02 41 00)

A. Blasting
    1. Blaster license
    2. Storage
    3. Transportation
    4. Blast area security
    5. Controlling radio transmissions (including phones)
    6. Warning Systems
    7. Misfire procedures
B. Excavations Other Than Tunnels and Shafts
    1. Slide protections
    2. Support systems
    3. Inspections
    4. Access
C. High Scaling
    1. Definition
    2. Personal protective equipment
    3. Specific operating procedure
D. Haulage
    1. Haul roads
    2. Equipment and Procedures

VII. Working Surfaces

A. Access
    1. Ladders
    2. Platforms, stairways, and ramps
B. Personal Protective Equipment
C. Scaffolding
D. Safety Nets

VIII. Protection of the Public

A. Signs and Barricades
B. Flagging Procedures
C. Jurisdictional Approvals

IX. Electrical Facilities

A. Substations

X. Required Safety Program Coordination

1. Confined Space Program
2. Electrical and Lockout/Tagout Program

This outline is provided as guidance in preparing a safety program and does not cover all material that may be necessary. The Contractor must review Specifications and all safety and health regulations to ensure a comprehensive plan.

END OF SECTION

SECTION 01 35 30

CONTRACTOR'S ONSITE SAFETY PERSONNEL

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 35 30-1, Resumes:
   1. Contractor's Onsite Safety Representative.
   2. Safety Professional.

C. RSN 01 35 30-2, Safety Inspection Reports:
   1. Include a list of noted deficiencies, their abatement dates, and follow-up action for all jobsite activities.
   2. Base inspection report on findings of jobsite walk-through with COR.

1.3 QUALIFICATIONS

A. Contractor's Onsite Safety Representative:
   1. Competent person, can be supervisory employee, with appropriate level of safety related training and experience. Safety responsibility may be adjunct, collateral or ancillary to their duties. Their main job duties may be leadership, supervision, or management in a craft, trade, or technical specialty.
   2. Has completed at a minimum an OSHA recognized 30 hour Construction Safety Training program and has a minimum of 3 years of experience on similar projects in size and complexity to this contract. Experience should show dealing with the day to day operations and functionality of equipment operations not just occasional safety inspection site visits.

B. Safety Professional:
   1. Holds professional status in the safety field by virtue of education, training, certification and experience. Responsibility must be the prevention of harm to people, property, and the environment, rather than responsibility for responding to harmful events. Examples of appropriate qualifications are:

a. Holds Safety certification from organizations accredited by the National Commission for Certifying Agencies (NCCA), the Council of Engineering and Scientific Specialty Boards (CESB), or a nationally recognized accrediting body which uses certification criteria equal to or greater than that of the NCCA or CESB.

b. Holds current certification as Certified Safety Professional (CSP), Associate Safety Professional (ASP), Occupational Health and Safety Technologist (OHST), Construction Health & Safety Technician (CHST) or equivalent with safety experience of a progressive nature on similar projects in size and complexity to this contract.

c. Holds a degree in Occupational Safety and Health: Major study – safety or occupational health related fields.

d. The effectiveness of the Contractor's Safety Professional in the administering and implementation of the safety program will be subject to continued review and approval by the Contracting Officer.

1.4 APPLICATION

A. Designate the Contractor's Onsite Safety Representative prior to start of construction, and employ a Safety Professional for part-time on the job.

1. Safety Professional requirements may be met by retaining appropriate level of services of an acceptable safety consultant.

B. Contractor's Onsite Safety Representative authorities, duties, and responsibilities:

1. Responsible for day to day implementation of the Contractor's Safety Program
2. Full authorization to correct unsafe acts on the spot.
3. Prepare safety inspection reports.
4. Onsite during any and all construction activities.

C. Safety Professional duties, and responsibilities:

1. Review and approve, by signature the Contractor's Safety Program prior to submittal.
2. Visit the site on an as-needed basis, but at a minimum of once per week.

1.5 QUALITY ASSURANCE

A. Contractor's Onsite Safety Representative:

1. The effectiveness of the Contractor's Onsite Safety Representative in prosecuting the safety program will be subject to continued review and approval by the CO.
2. Should the Contractor's safety effort be considered inadequate, the CO has the option to require the Contractor to employ a full-time qualified Safety Professional at no cost to the CO.

B. Safety Program:

1. The effectiveness of the Contractor's Safety Program will be subject to continued review and approval by the CO.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

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SECTION 01 51 00

TEMPORARY UTILITIES

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 REFERENCE STANDARDS

A. Institute of Electrical and Electronics Engineers (IEEE)

   1. IEEE C2-12 National Electrical Safety Code (NESC)

1.3 TEMPORARY ELECTRICITY

A. Contractor is responsible for suppling temporary electric power to the work site. Requests to PG&E to bring temporary power to the worksite shall be the responsibility of the Contractor.

B. Provide generators, transmission lines, distribution circuits, transformers, and other electrical equipment and facilities required for obtaining power and distributing power to points of use.

C. Comply with IEEE C2 clearances and spacing for temporary communications and supply lines.

D. Remove temporary equipment and facilities upon completion of Work.

1.4 TEMPORARY WATER

A. Provide water required for construction purposes.

B. Provide means of conveying water to points of use.

C. Water is not available from North Fork Battle Creek.

D. Water is not available from PG&E facilities.

E. Remove temporary equipment and facilities upon completion of work under this contract.

F. Use water which meets specified requirements for water used in concrete, soil-cement, masonry, grouting, and other permanent work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 REMOVAL

A. Remove temporary equipment and facilities upon completion of work under this contract.

END OF SECTION

SECTION 01 51 16

FIRE PROTECTION AND PREVENTION

<Update after consulting with State Fire Marshall>

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 THE REQUIREMENT

A. Contractor shall be prepared to carry out effective fire-protection.

1.3 REFERENCE STANDARDS

A. Public Resources Code Section 4291-4299 California Department of Forestry and Fire Protection (CALFIRE)
   1. CALFIRE Fire Prevention Requirements

1.4 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 51 16-1, Fire Protection and Prevention Plan.

1.5 REGULATIONS

A. Contractor shall coordinate with CALFIRE and notify them, as required, of proposed work activities.

B. Perform work in accordance with Federal, State and Local Codes and Regulations.

C. In the event of a conflict in referenced codes, regulations, standards, the most stringent shall apply.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 DEFENSIBLE SPACE

A. The Contractor shall include equipment and provisions for fire protection and prevention at each work location whenever work is in progress. Additionally the Contractor will address fire protection and prevention details in their site specific Safety Program.

B. Contractor shall provide at each location firefighting tools sufficient to equip all employees on the construction site. The employees are to be trained in the use of these tools which shall include as a minimum:

1. Serviceable round point shovels, overall length not less than 46-inches.
2. One 500 gallon minimum water tank (buffalo) or water truck equipped with attachment for fire hose.
3. Generator and pump.
4. 500-foot single jacket fire hose, 1½--inch diameter.
5. Spray nozzle.

C. Fire tools and preventative actions required at shops, staging areas, and other stationary work areas where equipment machinery or tools that can cause sparks are used:

1. Clear away flammable materials for a distance of 25-feet.
2. Maintain one serviceable round point shovel with an overall length not less than 46 inches.
3. Maintain an onsite 5-gallon pressurized water fire extinguisher.

D. Fire tools required in areas where portable tools powered by internal combustion engines are used within 25-feet of any flammable material.

1. One serviceable round point shovel, minimum overall length 46 inches.
2. One, 3- to 5-gallon pressurized fire extinguisher.

E. Passenger Vehicles and Construction Machinery Requirements:

1. Passenger vehicles, cars, pickups, light trucks, shall be equipped with one water fire extinguisher or back pack pump 3-gallon minimum capacity and a round point shovel.
2. Any internal combustion engine operated on or near forest, brush, and grass covered land shall be equipped with a spark arrester or the engine shall be constructed, equipped and maintained for prevention of fire.
    a. Trucks, truck tractors, buses and passenger vehicles, except motor cycles are exempt if equipped with a muffler defined in California vehicle code.

b. Turbo charged engines, with no exhaust by-pass, and in proper operating condition are exempt.

END OF SECTION

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SECTION 01 55 00

VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 REGULATORY REQUIREMENTS

A. Meet requirements established by jurisdictional authority for use of existing roadways and access trails; including seasonal or other limitations or restrictions.

1.3 SITE CONDITIONS

A. Rights-of-way for access to work from existing roads will be established by the CO.

B. Lower and Upper Barrier Sites:

   1. Vehicle access from 30105 Manton Road via a locked gate (lat: 40.410992, long: -121.922137). Construction parking located approximately 5,000 feet down gravel road.
   2. Vehicle access from 30464 Battle Creek Bottom Road via a locked gate (lat: 40.437752, long: -121.918589). Construction parking located approximately 5,000 feet down gravel road.
   3. Vehicular parking per the Contract Documents or as otherwise approved by the COR.

C. Maximum speed limit on all access roads will be 15 miles per hour except near residences and adjacent to other sensitive areas where a lower speed limit may be imposed.

PART 2 PRODUCTS

2.1 MATERIALS

A. Materials to maintain and repair existing roadways, access roads, access trails, and parking areas: In accordance with requirements of jurisdictional authority and land owner agreements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Investigate condition of available public or private roads for clearances, restrictions, bridge-load limits, bond requirements, and other limitations that affect or may affect access and transportation operations to and from the jobsite.

3.2 ACCESS

A. Maintain vehicle access for PG&E, COR, and landowner.

B. Maintain access to Eagle Canyon Dam infrastructure by foot for PG&E personnel.

3.3 ESTABLISHED ROADWAYS AND PARKING AREAS

A. Established roadways and parking areas are available for the Contractor's use subject to existing restrictions and approval of the COR.

3.4 TEMPORARY ROADWAYS AND PARKING AREAS

A. Roadways:

1. Construct temporary roadways for access from public thoroughfares to serve construction area of a width and load-bearing capacity to provide unimpeded traffic for construction purposes.
2. Construct temporary bridges or culverts at stream crossings or cross-drainage channels to maintain unimpeded surface drainage.

B. Parking Areas:

1. Construct temporary parking areas to accommodate use of construction personnel.
2. Construct at locations approved by COR. Promptly repair any damage to access travel ways.

3.5 HAUL ROUTES

A. Perform work on established rights-of-way as necessary to construct and maintain any roads, bridges, or drainage structures required for establishment and use of haul routes for construction operations.

B. Use existing available public highways, roads, or bridges as haul routes subject to applicable local regulations.

C. Minimize interference with or congestion of local traffic.

D. Provide barricades, flaggers, and other necessary precautions for safety of public where haul routes cross public highways or roads.

3.6 MAINTENANCE

A. Maintain roadways, parking areas, haul routes and access trail in a sound, reasonably smooth condition.

B. Maintain surfacing of gravel-surfaced and paved roads and parking areas in a smooth condition until completion and acceptance of all work under this contract.

3.7 REPAIR

A. Promptly repair any damage to access travelways.

3.8 REMOVAL

A. Remove materials used to construct temporary roadways, parking areas, and haul routes prior to contract completion. Recycle salvageable materials as approved by COR.

3.9 RESTORATION

A. Restore any access roads on private land to pre-project conditions or as specified in land owner agreement.

END OF SECTION

SECTION 01 55 20
TRAFFIC CONTROL

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 REFERENCE STANDARDS

A. California Manual on Uniform Traffic Control Devices

1.	MUTCD, Part 6	Temporary Traffic Control, Manual on Uniform Traffic Control Devices, 2014 Edition http://www.dot.ca.gov/hq/traffops/engineering/mutcd/pdf/camutcd2014/CAMUTCD2014.pdf

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 55 20-1, Traffic Control Plan:
   1. Submit traffic control plans for approval.
   2. Address all safety issues in the requirements for public and private access roads leading to and at project site.
   3. Include plans for coordination of construction activities with local public traffic.
   4. Include plans and telephone number for specified telephone "hot line."

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TRAFFIC CONTROL

A. Install an electronic variable message sign that can be used to give the public updates on construction activities.

B. Provide cones, delineators, concrete safety barriers, barricades, flasher lights, danger signals, signs, and other temporary traffic control devices as required to protect work and public safety.

C. Provide flaggers and guards as required to prevent accidents and damage or injury to passing traffic.

D. Do not begin work along public or private roads until proper traffic control devices for warning, channeling, and protecting motorists are in place in accordance with approved traffic control plan.

E. Maintain traffic flow and conduct construction operations to minimize obstruction and inconvenience to public traffic.

F. Provide unobstructed, smooth, and dustless passageway for one lane of traffic through construction operations.

G. Construct temporary connections for one lane of traffic between existing roadway and new construction.

H. Maintain convenient access to driveways, houses, and buildings along line of work.

I. Protect roads closed to traffic with effective barricades and warning signs. Illuminate barricades and obstructions from sunset to sunrise.

J. Remove traffic control devices when no longer needed.

END OF SECTION

SECTION 01 56 10

PROTECTION OF EXISTING INSTALLATIONS

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.
   2. Costs for repair of existing installation damaged by the Contractor are the Contractor's responsibility.

1.2 PROJECT CONDITIONS

A. The Contract Drawings do not identify existing above or below ground infrastructure. It is the Contractor’s responsibility to inspect the project site for existing infrastructure.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION

A. Provide protection for personnel and existing facilities from harm due to the Contractor's operations.

B. Arrange protective installations to permit operation of existing equipment and facilities while work is in progress.

3.2 REMOVAL OF PROTECTIVE INSTALLATIONS

A. Remove protective installations after purpose has been served. Materials furnished by the Contractor to provide protection remain property of the Contractor.

3.3 REPAIR

A. Repair, at Contractor's expense, damage to existing installations due to Contractor's operations or Contractor's failure to provide proper protection. At the CO's option, damage may be repaired by the CO, and the Contractor will be back-charged repair costs.

END OF SECTION

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SECTION 01 57 20
ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.
   2. Costs for damages and work stoppage are the Contractor's responsibility.

1.2 ENVIRONMENTAL CONDITIONS

A. Other sections pertaining to protection of the environment are included in these Contract Documents. It is the Contractor’s responsibility to be familiar with them.

B. Information on the protection of cultural resources is located in the contract clauses.

1.3 REGULATORY REQUIREMENTS

A. Comply with Federal, State, and local laws and regulations.

B. Streambed Alteration Agreement (California Fish and Game Code §1602).

- Update as necessary after receiving Lake and Streambed Alteration.

C. Conform to most stringent requirement in cases of conflict between specifications and regulatory requirements.

D. Contractor shall be responsible for damages resulting from dust originating from Contractor operations.

E. The CO may stop any construction activity in violation of Federal, State, or local laws and additional expenses resulting from work stoppage will be responsibility of Contractor.

1.4 DUST CONTROL

A. Contractor shall be responsible for damages resulting from dust originating from Contractor operations.

B. Provide dust control and abatement during construction.
   1. Refer to Section 31 02 10 - Water for Dust Abatement.

C. Implement dust control measures along dirt roads, near environmentally sensitive areas, and at construction sites to minimize the effects of dust on nearby elderberry shrubs as directed by the COR.

D. Provide labor, equipment, and materials, and use efficient methods wherever and whenever required to prevent dust nuisance or damage to persons, property, or activities, including, but not limited to, crops, orchards, cultivated fields, wildlife habitats, dwellings and residences, agricultural activities, recreational activities, traffic, and similar conditions.

E. Provide means for eliminating atmospheric discharges of dust during mixing, handling, and storing of cement, pozzolan, and concrete aggregate.

F. To limit dust emissions, stabilize disturbed areas, including storage piles, that are not being actively used for construction purposes using water or tarp or other suitable cover or vegetative ground cover.

G. Limit dust emissions on on-site unpaved roads and off-site unpaved access roads near environmentally sensitive areas as identified in Section 01 57 66 – Environmental Protection of Species and Habitats in accordance with Section 31 02 10 - Water for Dust Abatement.

H. Control land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities to limit fugitive dust emissions by applying water or by presoaking.

I. Cover or effectively wet material when materials are transported off site to limit visible dust emissions, and maintain at least 6 inches of freeboard space from the top of the container.

J. Stabilize outdoor storage piles following the addition of materials to, or the removal of materials from, said piles to limit fugitive dust emissions.

1.5 AIR POLLUTION CONTROL

A. Register portable engines and portable engine driven equipment units with the California Air Resources Board (CARB) portable equipment registration program (PERP). Refer to the following websites for information:

1. www.ciaqc.com/ciaqccarb/portable.html.
2. www.arb.ca.gov/portable/perp/information.html.

B. Obtain required permit from Tehama Air Pollution Control District and Shasta County Air Quality Management District.

C. Use reasonably available methods and devices to prevent, control, and otherwise

minimize atmospheric emissions or discharges of air contaminants.

D. Do not operate equipment and vehicles that show excessive exhaust gas emissions until corrective repairs or adjustments reduce such emissions to acceptable levels.

1.6 NOISE CONTROL

A. Do not perform earthwork, operate heavy equipment, or perform other activities, which produces high impact noise from 7:00 PM to 7:00 AM.

B. Provide equipment with efficient noise-suppression devices and employ other noise abatement measures such as enclosures and barriers as necessary for compliance with the noise limits specified above. In addition, schedule and conduct operations in a manner that will minimize, to greatest extent feasible, disturbances to public in noise sensitive areas (e.g., turn off or leave running at the lowest setting possible noise-generating construction equipment when not in use).

C. Notify the COR, residents, and other sensitive receptors in the areas affected by noise generated during construction activities of the approximate dates of construction and the potential resulting increases in noise at least two (2) weeks before construction begins.

1.7 LIGHT CONTROL

A. Use motion sensor controlled lighting where appropriate.

B. Install lights at the lowest allowable height.

C. Use lowest allowable wattage of lamp that is feasible.

D. Direct stationary floodlights to shine downward, at an angle less than horizontal, and away from surrounding areas.

1. Shield floodlights using a three-sided shield, creating a horizontal visor, so that floodlights will not be a nuisance to surrounding areas.

E. Direct lighting so that residences or buildings are not in direct beam of light.

F. Correct lighting control problems when they occur as approved by the COR.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

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SECTION 01 57 30

WATER POLLUTION AND EROSION CONTROL

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 REFERENCE STANDARDS

A. State of California
   1. California Stormwater Quality Association (CASQA)
      a. CASQA Construction Handbook (2009) — Stormwater Best Management Practice (BMP) Handbooks – Construction Handbook/Portal
   2. California Department of Fish and Wildlife, CDFW (formerly California Department of Fish and Game)
      a. CDFW Code Section 5650 — Division 6: Fish, Chapter 2: Pollution

B. Public Law
   1. Sections 311, 401, 402, and 404 — Clean Water Act (Public Law 92-500, as amended)

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 57 30-1, General Permit – Notice of Intent (NOI), Permit Registration Documents (PRDs), and other Documents:
   1. As required by the General Permit.
   2. Submit electronic and hard copies of required documents for CO and Legally Responsible Person (LRP) review and approval prior to upload to the SWRCB Storm Water Multi-Application and Report Tracking System (SMARTS).

C. RSN 01 57 30-2, General Permit – Qualifications and Certifications:
   1. The person(s) responsible for development and/or modifications to the Storm

Water Pollution Prevention Plan (SWPPP) as required by the General Permit (i.e., the Qualified SWPPP Developer (QSD)).

2. The person(s) responsible for BMP installation, inspections, monitoring, sampling testing, reporting, and record keeping as required by the General Permit (i.e., the Qualified SWPPP Practitioner (QSP)).

3. The person(s) responsible for submitting the NOI, PRDs, and other documents required by the General Permit through the SWRCBs SMARTS system.

D. RSN 01 57 30-3, Storm Water Pollution Prevention Plan (SWPPP):

1. The SWPPP shall be developed by a State of California Certified Qualified Stormwater Pollution Plan Developer (QSD). All revisions and amendments to the SWPPP shall be made by the QSD. The SWPPP shall be certified by the QSD.

E. RSN 01 57 30-4, Spill Prevention, Control, and Countermeasure (SPCC) Plan:

1. Submit when SPCC Plan is required.

a. SPCC Plan is required where release of oil and oil products could reasonably be expected to enter into or upon navigable waters of the United States or adjoining shorelines in quantities that may be harmful (40 CFR, Part 110), and aggregate on site oil storage capacity is over 1,320 gallons. Only containers with capacity of 55 gallons and greater are included in determining on site aggregate storage capacity.

2. Reviewed and certified by a California registered professional engineer in accordance with 40 CFR, Part 112, as required by section 311 of the Clean Water Act (Public Law 92-500 as amended).

F. RSN 01 57 30-5, Erosion and Sediment Control Plan:

1. The Erosion and Sediment Control Plan shall be a component of, or otherwise incorporated**,** into the SWPPP. (See article 1.06, paragraph E, subparagraph 1.)

G. RSN 01 57 30-6, Water Quality Monitoring Results:

1. Weekly submittals of surface water quality monitoring results (when applicable).

1.4 PROJECT CONDITIONS

A. Information on the protection of cultural resources is located in the Contract Clauses.

B. To meet Clean Water Act permit requirements, erosion and sediment control measures, wastewater and storm water management control measures, construction site management practices, solid waste control measures, and other control measures shall be implemented onsite utilizing best management practices (BMPs), as appropriate.

1.5 REGULATORY REQUIREMENTS

A. Comply with CDFW Code Section 5650, Prevention of Deleterious Materials from Entering State Waters, available at the following website www.leginfo.ca.gov/.html/fgc_table_of_contents.html.

B. Laws, Regulations, and Permits:

1. Perform construction operations to comply, and ensure subcontractors comply, with:

a. Applicable Federal, State, and local laws, orders, regulations, and Water Quality Standards concerning control and abatement of water pollution (including the State Water Resources Control Board Clean Water Act Section 401 water quality certification for the Battle Creek Salmon and Steelhead Restoration Project); and terms and conditions of applicable permits issued by permit issuing authority.

b. If conflict occurs between Federal, State, and local laws, regulations, and requirements, the most stringent shall apply.

C. Contractor Violations:

1. If noncompliance should occur, immediately verbally report noncompliance to the CO. Submit specific written information within 2 days.

2. Violation of applicable Federal, State, or local laws, orders, regulations, or Water Quality Standards may result in the CO stopping site activity until compliance is ensured.

3. The Contractor shall not be entitled to extension of time, claim for damage, or additional compensation by reason of such a work stoppage.

4. Corrective measures required to bring activities into compliance shall be at the Contractor's expense.

1.6 REQUIRED PERMITS

<UPDATE AS NECESSARY ONCE PERMITS HAVE BEEN OBTAINED>

A. Dredge and Fill Permit(s):

1. Pursuant to Section 404 of the Clean Water Act, CO has obtained permit(s) from the U.S. Army Corps of Engineers to discharge dredged or fill material into the waters of the United States (including wetlands).

2. CO shall provide the permit(s) to the Contractor, and the Contractor shall comply with terms and conditions of the permit(s).

B. Water Quality Certification for Discharges of Dredge and Fill Materials, and Compliance with California Environmental Quality Act (CEQA) findings, aka the Mitigation, Monitoring, and Reporting Plan (MMRP):

1. Pursuant to Section 401 of the Clean Water Act, CO has obtained a water quality certification from the State Water Resources Control Board to ensure that the discharge associated with the Clean Water Act Section 404 permit does not violate the State of California water quality standards contained within the Central Valley Regional Water Quality Control Board's Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin River Basin.

2. The water quality certification is attached for the Contractor's information, and the Contractor shall comply with terms and conditions of the water quality certification. The certification contains specific requirements to ensure compliance with the State of California's CEQA MMRP that identify requirements for work in active stream channels, including the Erosion and Sediment Control Plan provisions/component of the SWPPP.

3. The contractor shall also comply with Basin Plan requirements for monitoring of turbidity for in-channel work, as described in article 1.07 - Contractor Responsibilities, Paragraph B - Monitoring.

C. General Permit for Dewatering and other Low Threat Discharges to Surface Waters:

1. Notice of Intent (NOI):

a. Pursuant to Section 402 of the Clean Water Act, the Contractor shall prepare an NOI to obtain coverage under the Central Valley Regional Water Quality Control Board's Waste Discharge Requirement General Order for Dewatering and other Low Threat Discharges to Surface Waters.

b. The Contractor shall submit the NOI, along with associated fees, and comply with the terms and conditions of this General Order.

D. Storm Water Discharge Permit Associated with Construction and Land Disturbance Activities (General Permit):

1. Background:

a. The CO will execute a Notice of Intent (NOI) to acquire coverage under the National Pollutant Discharge Elimination System (NPDES), General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board (SWRCB); Order No. 2009-0009-DWQ as amended by Order No. 2012-0006-DWQ; NPDES CAS000002 (General Permit). The SWRCB prepared the General Permit in accordance with Section 402 of the Clean Water Act (Public Law 92-500 as amended).

b. A CO representative will be assigned to function as the Legally Responsible Person (LRP). The LRP will sign and execute the NOI, Permit Registration Documents, and other documents as may be required by the General Permit.

c. Prepare the NOI and coordinate with the CO to acquire executed NOI. Submit NOI with required Permit Registration Documents, except annual

fee, to the State Water Resources Control Board (SWRCB) through SMARTS.

d. The Contractor shall be responsible for physical delivery of all fee payments; initial permit coverage, annual, penalties, etc.; to the SWRCB. Acceptable delivery methods include, but are not limited to; hand delivery; regular mail; express mail and overnight mail.

2. Permit Registration Documents (PRDs):

a. Prepare Standard PRDs required by the General Permit.

b. Notice of Intent (NOI): Prepare and transmit NOI ready for signature by CO LRP. Coordinate with CO to acquire LRP signature to execute the NOI.

c. Risk Level Assessment (Standard or Site Specific): Prepare a Risk Level Assessment supporting construction activities required by this contract. Provide supporting documents and calculations for the Risk Level assessment.

d. Site Map: Prepared site map to include, as a minimum, items listed in Attachment B of the General Permit.

e. Storm Water Pollution Prevention Plan (SWPPP):

1) Prepare site specific SWPPP as required by the General Permit.

2) SWPPP shall be prepared by a Qualified SWPPP Developer (QSD) as required by the General Permit.

3) SWPPP shall be developed in consultation with the Central Valley Regional Water Quality Control Board (CVRWQCB).

f. Annual Fees: Calculate and make payment to the State Water Resources Control Board. Payments to include annual filing fees and penalties that may be incurred over the term of this contract.

g. Post Construction Water Balance Calculator (PCWBC): Provide a PCWBC as described in Appendix 2 of the General Permit.

h. Active Treatment System (ATS) Design Documents: If an ATS is required, develop and submit an ATS Plan in accordance with Attachment F of the General Permit. Submit system design, complete with supporting documentation, and proof that the system was designed by a qualified ATS design professional.

1) Provide operator certification for the operator(s) of the ATS.

i. Signed Certification Statements.

j. Access to the site to initiate construction activities will not be provided until the NOI and PRDs have been accepted by the SWRCB and a Waste Discharge Identification number (WDID) has been assigned.

3. Other Reporting Documents to be prepared, certified and submitted through SMARTS:

   a. Annual Report – shall be filed each year by September 1 (for the July 1 through June 30 compliance year).

   b. Required Water Quality Monitoring Reports.

   c. SWPPP Amendments.

   d. Notice of Termination – shall be filed when the project site has met the criteria defined in the General Permit for final stabilization.

   e. Information that may be requested during the life of the permit by the CVRWQCB, the SWRCB, the Environmental Protection Agency (EPA), or an authorized local storm water management agency.

   f. Other information required by the General Permit but not listed here.

4. Installation, Inspection, Monitoring, Reporting and Record Keeping:

   a. Provide best management practices (BMPs) and water treatment and control systems as required by the SWPPP.

   b. Provide inspection, monitoring, sampling, testing, and reporting as required by the General Permit and the SWPPP.

   c. Properly install BMPs and water treatment and control systems.

   d. Provide the recordkeeping required by the General Permit and the SWPPP.

   e. Properly operate and maintain BMPs, treatment systems, control systems, and appurtenances.

   f. Installation, inspection, monitoring, sampling, testing, and reporting activities shall be conducted or overseen by a Qualified SWPPP Practitioner (QSP) as required by the General Permit.

   g. Retain permit documents and records at the construction site. Provide access to and copies of permit and record documents to CVRWQCB, SWRCB, and EPA upon request. Maintain copies of permit and record documents through the life of the contract.

5. Storm Water Pollution Prevention Plan (SWPPP) Requirements:

   a. As a requirement of the Construction General Permit, the Contractor shall prepare, retain on-site, and implement a SWPPP that may be developed in consultation with the CVRWQCB.

   b. The Contractor shall prepare the SWPPP to follow the SWPPP guidelines of the Construction General Permit, including:

      1) Identify sources of pollution that could affect the quality of storm water discharges and authorized non-storm water discharges.

      2) Describe and ensure the implementation of BMPs to reduce or

prevent pollutants in storm water discharges and authorized non-storm water discharges.

3) Describe a water quality monitoring program for pH and turbidity, with sampling.

c. The SWPPP shall include operation phase monitoring of the effectiveness of BMPs, contingency measures, site restoration, and details about

Contractor responsibilities, a list of responsible parties, and a list of agency contacts. The monitoring program shall:

1) Demonstrate compliance with the permit.

2) Aid in the implementation of the SWPPP.

3) Measure the effectiveness of the BMPs in reducing or preventing pollutants in storm water discharges and authorized non-stormwater discharges.

d. The Contractor shall assign a Qualified SWPPP Developer (QSD) to the project in compliance with the General Permit. The QSD shall amend the SWPPP as required during construction.

6. Retention of Records:

a. As a requirement of the Construction General Permit, the Contractor shall retain records of monitoring information, copies of reports required by the permit, and records of data used to complete the activities in the NOI for a period of five years from the date of measurement, report or monitoring activity. Records are public documents and shall be provided to the CVRWQCB upon request.

7. Notice of Termination:

a. To terminate coverage under the Construction Storm Water General Permit, the Contractor shall complete and submit a Notice of Termination to the CVRWQCB. The Notice of Termination is to include an Annual Report for the period after July 1 that the facility was required to be permitted.

E. Erosion and Sediment Control Plan:

1. Contractor's QSD shall develop an Erosion and Sediment Control Plan in compliance with the State Water Resources Control Board's Section 401 water quality certification to avoid or minimize potential impacts related to erosion and subsequent discharge of settleable material and runoff. (The Erosion and Sediment Control Plan will be part of the SWPPP.) The Erosion and Sediment Control Plan shall include, but may not be limited to, the following BMPs for areas disturbed by construction activities to minimize sediment input into the aquatic system:

a. Avoid work or equipment operation in flowing water during in channel

activities by constructing cofferdams and diverting flows around construction sites.

1) When working in a flowing stream, divert the entire streamflow around or under the work area by a barrier, cofferdam, culvert, channel, or berm constructed of clean gravel.

b. Identify areas requiring clearing, grading, revegetation, and recontouring and minimize the extent of areas to be cleared, graded, and recontoured.

c. Use temporary and permanent erosion control measures, such as seeding, mulching, and 100 percent biodegradable erosion control blankets (the latter on 3:1 or steeper slopes) to minimize erosion.

d. Use sediment control measures, such as sediment fences/silt fences, fiber rolls certified as weed-free, sandbags, water bars, and baffles as sources of protection for waters, drainages, and wetlands.

e. Stabilize (non-jurisdictional) drainage channels using rock lining or similar natural materials.

f. Store construction spoils and salvaged topsoil out of waterways (above the ordinary high-water mark) and protect receiving waters from the soil stockpile areas using temporary erosion and sediment control measures.

g. Add water on exposed soils to minimize wind erosion and dust during construction.

h. Avoid disturbance of steep slopes whenever feasible.

i. Outslope new roads and construct rolling dips, water bars, and other drainage control measures. Information on design and construction of such measures is available at: http://na.fs.fed.us/spfo/pubs/stewardship/accessroads/accessroads.pdf and http://www.wildfirezone.org/assets/images/resource_docs/rural%20roads.pdf.

F. SPCC Plan (or Spill Pollution Prevention Plan):

1. Pursuant to Section 311 of the Clean Water Act, the Contractor shall prepare a Spill Pollution Prevention Plan whenever the location of a construction site is such that oil from an accidental spillage could reasonably be expected to enter into or upon navigable waters of the United States or adjoining shorelines, and aggregate storage of oil at a site is over 1,320 gallons or a single container has a capacity in excess of 660 gallons. The Spill Pollution Prevention Plan shall be developed in consultation with the CVRWQCB and approved by the Chief of the Division of Water Rights at the State Water Resources Control Board before beginning construction and/or storing hazardous materials on the project site. The Spill Pollution Prevention Plan shall also be reviewed and certified by a California registered professional engineer.

2. The Spill Pollution Prevention Plan shall include strict on-site handling rules to

keep construction and maintenance materials out of the waterway and other watercourses. These rules include the following measures, which shall be implemented by the Contractor to prevent contamination, clean up spills, provide staging and storing areas, and minimize equipment operations in flowing water.

3. Restrict the volume of petroleum products allowed on site to the volume that can be addressed by the spill control and response measures.
4. Prevent contamination of streamside soil and the watercourse from cement; concrete or concrete washings; asphalt, paint, or other coating materials; oil or other petroleum products; and hazardous materials.
5. Clean up spills immediately and notify the CDFW immediately of spill and cleanup procedures.
6. Provide staging and storage areas outside the stream zone for equipment, construction materials, fuels, lubricants, solvents, and other possible contaminants.
7. Store hazardous substances in staging areas at least 100 feet from receiving waters.
8. Perform refueling and vehicle maintenance at least 100 feet from potential receiving waters.
9. Minimize equipment operations in flowing water and remove vehicles from the normal high-water area before refueling and lubricating.
10. Inspect equipment to ensure that seals prevent fuel, engine oil, or other fluids from leaking.
11. The Spill Pollution Prevention Plan shall also include, but not be limited to, the following conditions:
    a. Construction workers shall be trained to identify indicators of contaminated soils such as soil discoloration, odors, differences in soil properties, and buried debris.
    b. Construction workers shall also be trained to be aware of proper handling techniques and appropriate responses and actions to be taken if hazardous materials are accidentally released, with special emphasis on those hazardous materials with the greatest potential to occur at the project sites.
    c. Measures shall be implemented to reduce the amounts of hazardous materials in use at the project sites.
    d. Soils contaminated with fuels or chemicals shall be disposed of in a suitable location to prevent discharge to surface waters and in accordance with the rules and regulations of the U.S. Department of Transportation, the U.S. Environmental Protection Agency, and the California Environmental Protection Agency.
    e. Suspected contaminated soils shall be tested at an approved certified laboratory.

1) Laboratory testing shall include constituents associated with suspected chemicals. Detected concentrations shall be compared to applicable regulatory thresholds to determine the level of contamination and the disposition of the soil.

f. Temporary cofferdams shall be used to separate construction areas from flowing waters.

g. On-site fuels and toxic materials shall be placed or contained in an area protected from direct runoff.

h. If hazardous materials are released, the Chief of the Division of Water Rights at the State Water Resources Control Board, the CVRWQCB, the Coleman National Fish Hatchery, and the Darrah Springs State Fish Hatchery shall be immediately notified. The Emergency Response Plan shall also be implemented.

i. Cement and concrete delivery and transfer equipment shall be washed in contained areas protected from direct runoff until the material sets to prevent contamination of streamside soil and the watercourses.

12. The Spill Pollution Prevention Plan shall also include, but may not be limited to, the following measures to minimize exposure of the public to hazardous or toxic materials associated with construction activities:

a. Clearly mark construction areas around each dam site as hazardous and off-limits to the public.

b. Backfill or cover excavated areas and other particular areas of hazards at the end of each workday.

c. Fence off areas around the project sites, and gate and lock access roads to deter public access.

1.7 CONTRACTOR RESPONSIBILITIES

<UPDATE AS NECESSARY ONCE PERMITS HAVE BEEN OBTAINED>

A. Permits:

1. Pay annual fees to acquire, maintain, and terminate the General Permit.

2. Under the terms of the General Permit, the CO, as the Legally Responsible Person on the NOI, will be held accountable for compliance with requirements of the General Permit. Through these contract documents, the CO requires the Contractor to assume compliance obligations and responsibilities associated with the General Permit. The CO will designate the Contractor as a Data Submitter in SMARTS to enable the Contractor to submit required materials to the SWRCB to comply with the General Permit. In the event the SWRCB or the CVRWQCB issues a deficiency notice, cites and/or fines the CO for failure to comply with the General Permit, the Contractor will be notified by the CO to correct

deficiencies noted and/or pay fines so required. Costs associated with these corrective actions will be at the Contractors expense.

B. Monitoring:

1. Conduct monitoring in order to meet the requirements of permits which may include:
   a. Sampling.
   b. Site inspections.
   c. Required field and laboratory tests to determine water quality characteristics.
2. The Contractor shall implement a water quality monitoring program for turbidity as follows:
   a. Water turbidity immediately above and 500 feet downstream of the construction site shall be tested using a hand-held turbidity meter a minimum of two times each workday.
   b. If daily average downstream turbidity levels are found to increase more than 20 percent over background (upstream) turbidity, construction activities shall cease until turbidity decreases to acceptable levels.

C. Reporting Results:

1. Develop and submit reports and other documents as required by permits.
2. Electronically submit daily results to the CO the morning after the data are collected.

D. Recordkeeping:

1. Retain records and data required by permits.

E. Training:

1. Provide ongoing, periodic "tailgate" training sessions for construction site personnel involved with the installation and maintenance of BMPs, in accordance with the General Permit. Training sessions shall be executed by the Contractor's Qualified SWPPP Practitioner (QSP). Documentation of training sessions shall be retained with the onsite SWPPP records.

PART 2 PRODUCTS

2.1 EROSION CONTROL

A. Conform with requirements of the Construction General Permit.

B. Straw Bales, if used: Certified weed free.

C. Erosion and Sediment Control Fabrics: Woven non-filament-jointed.

D. Rolled Erosion Control Products (RECPs):

1. Erosion control blankets shall be 100 percent biodegradable.

2. Made of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials.

3. The netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be biodegradable. Use of plastic netting is prohibited.

PART 3 EXECUTION

3.1 COORDINATION AND SURVEILLANCE

A. Prior to the work, the Contractor shall meet with the COR to develop mutual understandings relative to the administration and implementation of the environmental requirements of the contract.

B. During the work, the Contractor shall oversee activities, including those of subcontractors, to assure compliance with the intent and details of the requirements.

C. All equipment and materials for environmental protection shall be inspected periodically to assure that they are in proper order and have not deteriorated.

3.2 POLLUTION CONTROLS

A. Control pollutants by use of sediment and erosion controls, wastewater and stormwater management controls, construction site management practices, and other controls including State and local control requirements.

B. Sediment and Erosion Controls:

1. Establish methods for controlling sediment and erosion which address vegetative practices, structural control, silt fences, straw wattles, sediment controls, and operator controls as appropriate.

2. Institute storm water management measures as required, including velocity dissipaters, and solid waste controls which address controls for building materials and offsite tracking of sediment.

3. Protect, maintain, and repair measures as often and timely as necessary to comply with permits. Consider erecting temporary fencing to exclude cattle from areas with installed measures that could be damaged. The Contractor is responsible for damage caused by cattle.

C. Wastewater and Storm Water Management Controls:

1. Pollution Prevention Measures:

a. Use methods of dewatering, unwatering, excavating, or stockpiling earth and rock materials which include prevention measures to control silting and erosion, and which will intercept and settle runoff of sediment-laden waters.

b. Prevent wastewater from general construction activities such as drainwater collection, aggregate processing, concrete batching, drilling, grouting, or other construction operations, from entering flowing or dry watercourses without the use of approved turbidity control methods.

c. Divert storm water runoff from upslope areas away from disturbed areas.

2. Turbidity Prevention Measures:

a. Use methods for prevention of excess turbidity which include, but are not restricted to, intercepting ditches, settling ponds, gravel filter entrapment dikes, flocculating processes, recirculation, combinations thereof, or other approved methods that are not harmful to aquatic life.

b. Wastewaters discharged into surface waters shall meet conditions of section 402, the National Pollutant Discharge Elimination System (NPDES) permit.

c. Do not operate mechanized equipment in water bodies without having first obtained a section 404 permit, and then only as necessary to construct crossings or perform the required construction.

D. Construction Site Management:

1. Contractor Construction Operations:

a. Perform construction activities by methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris, or other pollutants or wastes into streams, flowing or dry watercourses, lakes, wetlands, reservoirs, or underground water sources.

1) Pollutants and wastes include, but are not restricted to: refuse, garbage, cement, sanitary waste, industrial waste, hazardous materials, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.

2. Stockpiled or Deposited Materials:

a. Do not stockpile or deposit excavated materials or other construction materials, near or on, stream banks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm runoff, or can encroach upon the watercourse.

3. Petroleum Product Storage Tanks Management:

a. Place oil or other petroleum product storage tanks at least 100 feet from streams, flowing or dry watercourses, lakes, wetlands, reservoirs, and other water source.

b. Do not use underground storage tanks.

c. Construct storage area dikes at least 12 inches high or graded and sloped to permit safe containment of leaks and spills equal to two times the

capacity located in the area plus sufficient amount freeboard to contain the 25-year rainstorm.

1) Line diked areas with an impermeable barrier at least 50 mils thick.

d. Areas for refueling operations: Line with impermeable barrier at least 10 mils thick covered with 2 to 4 inches of soil.

END OF SECTION

SECTION 01 57 50

TREE AND PLANT PROTECTION

PART 1 GENERAL

1.1 SUMMARY

A. This specification provides details for tree and plant protection.

B. Contractor is responsible to know the Permit conditions with respect to tree and plant protection.

C. Vegetation clearing, with exception of minor trimming, work is only permitted between <UPDATE ONCE KNOWN> and in in accordance with Section 01 57 66 - Environmental Protection of Species and Habitats, and Permits.

1.2 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.
   2. Costs for employing certified arborist, repair or treatment of injured vegetation and replacement of trees or shrubs are the Contractor's responsibility.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 57 50-1, Arborist Qualifications

1.4 ENVIRONMENTAL CONDITIONS

A. Information on the protection of cultural resources is located in the Contract Causes.

1.5 QUALIFICATIONS

A. Certified Arborist: Employ services of a certified arborist to direct repair, treatment, and replacement of vegetation.

PART 2 PRODUCTS

2.1 REPLACEMENT TREES AND SHRUBS

A. Species: For native trees or shrubs, same species shall be used to replace removed plant; for nonnative trees or shrubs, native species to be substituted to replace removed plant, as approved by COR.

B. Size: Determine diameter-at-breast-height (DBH) of removed plant. Standard method of expressing the trunk of a tree; measurement taken with a diameter tape at 4.5 feet from the ground surface) of removed plant. For every three inches of DBH, one tree-pot sized plant shall be installed as a replacement on site (tree-pot container size is 4 inches by 14 inches).

2.2 PRESERVATION FENCING

A. Refer to Section 01 57 67 - Temporary Preservation Fence.

PART 3 EXECUTION

3.1 PRESERVATION AND PROTECTION

A. Preserve natural landscape and preserve and protect existing vegetation not required or otherwise authorized to be removed.

1. Submit requests to remove vegetation not specifically required to be removed to the COR.

B. Conduct operations to prevent unnecessary destruction, scarring, or defacing of natural surroundings in the vicinity of the work.

C. Move crews and equipment within the rights-of-way and over routes provided for access to the work in a manner to prevent damage to grazing land, crops, or property.

D. Protect vegetation from damage or injury caused by construction operations, personnel, or equipment by the use of protective barriers or other methods approved by the COR.

E. All tree work shall be performed under the direction of a certified arborist.

F. Minimize, to the greatest extent practicable, clearings and cuts through vegetation. Irregularly shape authorized clearings and cuts to soften undesirable aesthetic impacts.

G. Do not use trees for anchorages except in emergency cases or as approved by the COR.

1. For such use, wrap the trunk with a sufficient thickness of approved protective material before rope, cable, or wire is placed.

2. Submit requests to use trees for anchorage, except for emergencies. Include description of protective material.

H. Use safety ropes where tree climbing is necessary; do not use climbing spurs.

I. Avoid the root zone of individual trees that have been identified to be protected.

1. Install and maintain preservation fencing around trees as directed by the COR.
2. Refer to Section 01 57 66 - Environmental Protection of Species and Habitats.
3. Where avoidance is not possible, long-term impacts on riparian woody vegetation and oaks shall be minimized by trimming limbs and branches over access roads or construction zones and by avoiding parking and excavating in the root zone.

J. COR will routinely inspect protected areas to ensure that protective measures are in place and effective.

K. Protective measures shall remain in place until construction activities have been completed.

3.2 REPAIR, TREATMENT, OR REPLACEMENT

A. The Contractor is responsible for injuries to vegetation caused by Contractor operations, personnel, or equipment.

B. Employ the services of an experienced arborist or licensed tree surgeon to direct repair, treatment, and replacement of injured vegetation. Submit qualifications of experienced arborist or licensed tree surgeon to COR prior to employment.

C. Repair or treat injured vegetation without delay and as recommended by and under direction of an experienced arborist or licensed tree surgeon.

D. Remove and dispose of trees or shrubs not required or otherwise authorized to be removed that, in the opinion of the COR, are injured beyond saving.

E. Replace removed tree or shrub with tree or shrub approved by the COR.

END OF SECTION

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SECTION 01 57 66

ENVIRONMENTAL PROTECTION OF SPECIES AND HABITATS
<UPDATE AS NECESSARY AFTER PERMITS/STUDIES/OPINIONS HAVE BEEN COMPLETED>

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 DEFINITION

A. Environmentally sensitive locations: Areas that support threatened and endangered species, species of concern and special-status species, migratory bird nesting, woody riparian vegetation, wetlands and other waters of the United States.

1.3 REFERENCE STANDARDS

A. National Marine Fisheries Service (NMFS)
   1. NMFS BO Biological Opinion #XXXX

B. U.S. Fish and Wildlife Service (USFWS)
   1. USFWS BO Biological Opinion #XXXX

1.4 REGULATORY REQUIREMENTS

A. Comply with Federal, State, and local laws and regulations, which include the following:
   1. National Environmental Policy Act (42 USC 4321-4347).
   2. California Environmental Quality Act (Public Resources Code §21000 et seq.).
   3. Federal Endangered Species Act (16 USC 1531-1549).
   4. Bald and Golden Eagle Protection Act (16 USC 668-668c).
   5. California Endangered Species Act (California Fish and Game Code §§2050-2068).
   6. U.S. Fish and Wildlife (USFWS) Coordination Act (16 USC 661- 667e).

7. Federal Migratory Bird Treaty Act (16 USC 703-712).
8. Federal Clean Water Act, Section 404 (33 USC 1251-1376).
9. U.S. Fish and Wildlife Mitigation Policy (46 CFR 7644, January 23, 1981).
10. California Native Plant Protection Act (California Fish and Game Code §1900 et seq.).
11. California State Senate Resolution No. 1, January 18, 1989 (pertains to the conservation of oak woodlands).
12. Federal Carlson-Foley Act (43 USC 12241-1243); Federal Noxious Weed Act of 1974 (7USC 2814 et seq.); Executive Order 13112 (pertains to the identification, prevention and control of invasive plant species, including noxious weeds).

B. Conform to the most stringent requirement in cases of conflict between specifications, regulatory requirements, and permits.

1.5 PROJECT CONDITIONS

A. Information on the protection of cultural resources is located in the Contract Clauses.

B. Federal and State of California endangered and threatened species, and/or their habitats exist in the project area. These species include:

1. Central Valley steelhead.
2. Central Valley spring-run Chinook salmon.
3. Sacramento River winter-run Chinook salmon.
4. Bald eagle.
5. Valley elderberry longhorn beetle.

C. Federal species of concern, state species of special concern (such as foothill yellow-legged frog and northwestern pond turtle), migratory birds, and sensitive plant species and plant communities also exist in the project area.

1.6 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

1.7 SPECIAL REQUIREMENTS

A. The Contractor shall cooperate with the COR to ensure that environmental protection measures, such as environmental fencing, flagging, staking, and setback buffers are maintained, that environmental guidelines are followed, and that appropriate environmental compliance documentation is maintained.

B. Implement the following general environmental protection measures to protect species and habitats.

1. Worker Environmental Education Program:

a. All Construction Contractor and Subcontractor personnel shall participate in and comply with a CO provided environmental training program.

1) Individual employees shall complete the training (approximately one (1) hour in length) before beginning work on project site.

2) Contractor shall give the COR twenty-four (24) hour advance notice of new employees needing this training.

b. This program will include, but is not limited to training regarding:

1) Federal, state, and local environmental laws and regulations and permits, as well as the penalties for non-compliance with permit environmental requirements, conditions and measures.

2) Threatened and endangered species, species of concern and species of special concern, and their habitats.

3) Environmentally sensitive locations.

4) Cultural resources.

5) Noxious weed abatement.

6) Environmental mitigation, compensation, and restoration measures

c. A member of the Contractor's management staff shall participate in a training session.

d. Upon completion of each training session described above, each employee shall sign a statement indicating that he/she has received the training and will be issued a hard hat sticker.

2. Demarcation of Environmentally Sensitive Locations:

a. Prior to this contract, CO-retained environmental monitors will identify environmentally sensitive locations and flag their limits in the field.

b. Avoid environmentally sensitive areas.

c. Install and maintain preservation fencing at these locations as directed by COR.

1) Refer to Section 01 57 66 - Temporary Preservation Fence and Section 01 57 50 - Tree and Plant Protection.

3. Contractor Use Areas:

a. Construction personnel shall perform activities within the Contractor Use Area limits. Construction personnel shall avoid marked environmentally sensitive locations within and outside of the Contractor Use Area limits.

1) Use and storage of construction equipment, including helicopters, shall be confined within the designated Contractor Use Area limits.

2) Trees and shrubs located within the Contractor Use Area limits to be protected unless otherwise noted in the Contract Drawings or as approved by the COR.

3) Existing roads and access points shall be used to minimize disturbance to wildlife and their habitats.

4) Excavating, filling, and other earth moving activities within the Contractor Use Areas shall be done gradually to allow wildlife to escape in advance of machinery and moving soils. CO retained environmental monitors will observe activities.

5) Operate within the limits of the Contractor Use Areas shown on the Contract Drawings and described in Section 01 14 10 - Use of Site.

4. Environmental Timeframes:

a. All activities shall be completed in a timely manner to minimize their duration and resulting impacts.

b. All activities shall occur during the times of the year that are least detrimental to the environment. Specific timeframes are summarized in Table 01 57 66A - Environmental Timeframes, and described below.

Table 01 57 66A – Environmental Timeframes

Species Protected	Contractor Responsibility and Timing	Description of Contractor Responsibility
Migratory birds, Special status birds	Remove vegetation between September 1 and January 31	Remove vegetation in the Contractor Use Area limits, as directed by the COR, between September 1 and January 31 before beginning construction to prevent the nesting of special status and migratory birds at the project site. Vegetation shall not be removed between February 1 and August 31. If vegetation cannot be removed between September 1 and January 31, a CO-retained environmental monitor will implement appropriate measures, with approval from USFWS, to minimize the nesting of special status and migratory birds at the project site.
Yellow-legged frog Northwestern pond turtle	Notify COR two weeks before beginning construction and again before beginning work in the stream channel	Notify the COR of construction timing at least two (2) weeks in advance so that CO-retained environmental monitors can implement environmental protection measures for foothill yellow-legged frog and northwestern pond turtle.
	Install exclusion fencing 4 days before beginning construction in the stream channel	Install exclusion fencing in the work area 4 days prior to construction activities as directed by the COR if preconstruction surveys conducted by CO-retained environmental monitors detect foothill yellow-legged frogs and/or northwestern pond turtles in the project area. The Contractor shall maintain exclusion fencing until work in the area is complete.

C. Implement the following specific environmental protection measures to protect species and habitats.

1. Noxious Weed Control:

a. Before working on site, construction supervisors and managers shall be educated by CO retained environmental monitors on weed identification and the importance of controlling and preventing the spread of noxious weeds, as well as measures required to control and prevent the spread of noxious weeds.

b. Wash earth-disturbing construction vehicles before entering and after leaving to avoid the spread of noxious weeds.

1) Because of the remoteness of the project area, equipment washing shall be performed off site at a paved facility (located away from sensitive biological resource areas).

2) CO-retained environmental monitors and construction inspectors will routinely inspect construction activities to verify that construction equipment is being washed.

c. Use certified weed-free native mixes in accordance with Section 32 92 20 - Seeding.

2. Wetlands and other Waters of the United States:

a. Comply with conditions contained in the Clean Water Act Section 404 Permit obtained for this project. The CO will provide the Contractor with a copy of this permit. Refer to Section 01 57 30 - Water Pollution and Erosion Control.

b. Prior to this contract, CO-retained environmental monitors will provide a map of potential wetland areas and other aquatic habitats that may support northwestern pond turtles and foothill yellow-legged frogs, as determined during pre-construction surveys.

c. Adhere to requirements of the Stormwater Pollution Prevention Plan, described in Section 01 57 30 - Water Pollution and Erosion Control.

d. Where determined necessary by CO-retained environmental monitor, install geotextile cushions and other materials (e.g., timber pads, prefabricated equipment pads, geotextile fabric) in saturated conditions to minimize damage to the substrate and vegetation.

e. The Contractor shall complete activities promptly to minimize their duration and resultant impacts.

3. Woody Riparian Vegetation:

a. Construction activities that could adversely affect nesting migratory birds and special status birds include the removal of woody riparian vegetation.

b. Prior to clearing, CO-retained environmental monitors will flag areas of woody riparian vegetation that shall be saved.

1) Install and maintain preservation fencing at flagged locations in accordance with Section 01 57 67 - Temporary Preservation Fence.

c. All tree work shall be performed under the direction of a certified arborist.

d. Where avoidance is not possible, long-term impacts on woody riparian vegetation shall be minimized. Refer to Section 01 57 50 - Tree and Plant Protection.

1) Limbs and branches shall be pruned where possible rather than removing the entire plant.

e. Trees and shrubs located within the Contractor Use Area limits may be removed unless identified by CO-retained environmental monitor for protection. Refer to Section 31 11 00 - Clearing and Grubbing.

1) Remove woody riparian vegetation between September 1 and January 31 (i.e., outside the breeding season for migratory and special status birds), as directed by the COR. Woody riparian vegetation shall not be removed between February 1 and August 31.

2) If woody riparian vegetation cannot be removed between September 1 and January 31, a CO-retained environmental monitor will implement appropriate hazing methods, with approval from USFWS, to minimize the nesting of special status and migratory birds at the project site.

4. Native Oak Woodland Habitat:

a. Construction activities that could adversely affect nesting migratory and special status birds include the removal of oak woodland habitat.

b. Prior to clearing, CO-retained environmental monitors will flag areas with native oak woodland habitat that shall be saved.

1) Install and maintain preservation fencing at flagged locations in accordance with Section 01 57 67 - Temporary Preservation Fence.

c. All tree work shall be performed under the direction of a certified arborist.

d. Where avoidance is not possible, long-term impacts on oak trees shall be minimized. Refer to Section 01 57 50 - Tree and Plant Protection.

1) Limbs and branches shall be trimmed over access roads or construction zones.

2) Parking, driving, placing fill or materials, and excavating shall be avoided in the root zone.

e. Trees located within the Contractor Use Area limits may be removed unless identified by CO-retained environmental monitor for protection. Refer to Section 31 11 00 - Clearing and Grubbing.

1) Remove oak trees between September 1 and January 31 (i.e.,

outside the breeding season for migratory and special status birds), as directed by the COR. Oak trees shall not be removed between February 1 and August 31.

2) If oak trees cannot be removed between September 1 and January 31, a CO-retained environmental monitor will implement appropriate hazing methods, with approval from USFWS, to minimize the nesting of special status and migratory birds at the project site.

5. Elderberry Shrubs:

a. Because elderberry shrubs can provide habitat for the valley elderberry longhorn beetle, a Federally listed species, 'Reasonable and Prudent Measures and Conservation Measures' associated with the elderberry shrubs are discussed in the Federal Endangered Species Act Biological Opinion, prepared by the United States Fish and Wildlife Service (USFWS). The CO will provide a copy of this Biological Opinion to the Contractor, and the Contractor shall comply with these measures. Elderberry shrubs listed in the following table have been located at the and Eagle Canyon Diversion Dam project sites.

Table 01 57 66B – Location of Elderberry Shrubs

Number of Shrubs	Project Site	Description of Shrub Location	Contractor Action
3	Eagle Canyon Diversion Dam	Three elderberry shrubs (shrubs #59, #67 and #70) are on the south bank of North Fork Battle Creek. Elderberry shrub #59 is located approximately 200 feet southwest (i.e., downstream) of Eagle Canyon Diversion Dam, shrub #70 is located approximately 280 feet southwest of Eagle Canyon Diversion Dam and elderberry shrub #67 is located at the northern edge of Contractor Use Area #3 on the south canyon plateau.	After receiving direction and approval from the COR, the Contractor shall remove or trim elderberry shrub #59 and elderberry shrub #67. The Contractor shall install preservation fencing around shrub #70, as directed by CO-retained environmental monitors, to avoid removal or disturbance of the shrub.
1	Eagle Canyon Diversion Dam	This elderberry shrub (shrub #60) is found along the north access road to Eagle Canyon Diversion Dam, approximately 400 feet south of the entrance gate from Battle Creek Bottom Road and approximately 30 feet west of the access road.	The Contractor shall install preservation fencing around the shrub, as directed by CO-retained environmental monitors, to avoid removal or disturbance of the shrub. The Contractor shall also implement dust control measures to minimize construction impacts to the shrub.

b. Prior to this contract, CO-retained environmental monitors will stake or flag elderberry shrubs in or near the Contractor Use Areas.

1) Avoiding impacts to potential valley elderberry longhorn beetle habitat requires a 100-foot no-disturbance buffer between the elderberry shrub and construction activities.

a) Except that the work and associated construction activities that are in close proximity of the above shrubs has been approved by USFWS on the condition of implementing the mitigations measures described herein.

2) To avoid disturbance, install and maintain temporary preservation fencing around elderberry shrubs with stems 1.0 inch or more in diameter within 100 feet of the construction zone, as directed by a CO-retained environmental monitors and in accordance with Section 01 57 67 - Temporary Preservation Fence.

3) No ground-disturbing activities shall be permitted within the 100-foot buffer zone, except as described above.

4) Some activities will be allowed within the 20-to-100-foot range (e.g., driving construction vehicles along access roads), as long as dust control measures are implemented to minimize dust disturbance on those shrubs located within 20 to 100 feet of the roads.

5) Comply with dust control measures specified in Section 01 57 20 - Environmental Controls, along dirt access roads near environmentally sensitive areas and at construction sites to minimize the effects of dust on nearby elderberry shrubs.

c. At locations specified by the CO-retained environmental monitors, erect signs to protect valley elderberry longhorn beetle habitat, as specified in Section 01 57 67 - Temporary Preservation Fence.

1) Erect signs every 50 feet along the edge of the avoidance areas.

2) Signs shall read “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. The ESA of 1973, as amended, protects this species. Violators are subject to prosecution, fines, and imprisonment.”

3) Signs shall be clearly readable from a distance of 20-feet and shall be maintained for the duration of construction.

4) Avoid fenced areas identified as valley elderberry longhorn beetle habitat.

6. Migratory Bird and Special Status Bird Nesting:

a. Construction activities that could adversely affect nesting migratory birds and other special status birds include the removal of riparian and other

woody vegetation (e.g., oak woodland).

b. Before construction begins, CO-retained environmental monitor will flag nesting habitat as "work exclusion zones" based on preconstruction surveys.

1) To avoid these environmentally sensitive areas, install and maintain preservation fencing in accordance with Section 01 57 67 - Temporary Preservation Fencing.

c. Riparian woody vegetation and oak woodland that must be removed as part of this contract shall be removed by the Contractor between September 1 and February 1 (i.e., outside the breeding season).

1) If trees cannot be removed between September 1 and January 31, a CO-retained environmental monitor will implement appropriate hazing methods, with approval from USFWS, to minimize the nesting of migratory and special status birds at the project site.

2) CO-retained environmental monitors will monitor construction sites for bird nesting activity during the breeding season.

3) Unless it is known that the nest site will be physically disturbed, birds shall be allowed to nest. Birds that choose to nest during construction are assumed to not be adversely affected by construction noise and activity during the breeding season.

7. Bald Eagle Habitat:

a. "Reasonable and Prudent Measures and Conservation Measures" to protect the Federally-listed bald eagle are discussed in the USFWS BO.

1) The CO will provide a copy of this Biological Opinion to the Contractor, and the Contractor shall comply with the measures.

b. To avoid or reduce the disturbance of bald eagles by helicopter flights between construction sites and stockpiling or staging areas, helicopter flights shall be restricted to paths outside a 0.5-mile line-of-sight zone around active bald eagle nests.

c. The CO will provide a map to the Contractor showing the buffer zone.

d. To minimize the duration of disturbance at construction sites, helicopter activity shall be completed efficiently and in a timely manner.

8. Yellow-Breasted Chat Breeding Habitat:

a. CO-retained biologists will conduct pre-construction surveys at project sites to locate nests of the yellow-breasted chat, which are considered a state species of special concern. If nesting chats are located, construction activities will be limited, if possible, to the nonbreeding season (from mid-August to mid- April) to avoid noise disturbance to this species or

direct removal of their riparian habitat.

b. If construction-related activities are to occur during the yellow-breasted chat breeding season (mid-April to mid-August) they shall begin before April 15. A qualified biologist designated by the will monitor construction sites for bird nesting activity during the breeding season. Unless it is known that the nest site will be physically disturbed, the birds shall be allowed to nest if they choose under the assumption that they will be able to tolerate the construction noise and activity.

c. If construction-related activities cannot begin by April 15, additional mitigation measures will be developed by the CO in consultation with the USFWS. New measures required of the Contractor will be presented to the Contractor by the CO in a Request for Proposal.

9. Foothill Yellow-Legged Frog Habitat:

a. Two (2) weeks in advance of instream work: Notify the CO of construction timing for each site at least two (2) weeks in advance so the CO can implement applicable measures to remove foothill yellow-legged frogs from the Contractor Use Areas.

1) At this time a CO-retained environmental monitor will conduct focused surveys for foothill yellow-legged frogs.

b. Four (4) days before beginning work in or near frog habitat: If preconstruction surveys detect frogs, tadpoles, or egg masses in the Contractor Use Area, install and maintain exclusion fencing in the Contractor Use Area four (4) days prior to construction activities at the location(s) flagged by CO-retained environmental monitors and in accordance with Section 01 57 67 - Temporary Preservation Fence.

c. Three (3) days before beginning work in or near frog habitat: For three (3) days prior to construction activities, CO-retained environmental monitors will survey the Contractor Use Area (one survey each day) for foothill yellow-legged frogs and relocate frogs, tadpoles, or egg masses found within the Contractor Use Area to the nearest suitable habitat outside the Contractor Use Area and away from the exclusion fencing.

d. CO-retained environmental monitors and construction inspectors will routinely inspect protected areas to ensure that protective measures are in place and are effective.

e. Restore affected foothill yellow-legged frog habitat site to its original contours as directed by the COR.

10. Northwestern Pond Turtle Habitat:

a. Notify the CO of construction timing for each site at least two (2) weeks in advance of stream work so the CO can implement applicable measures to remove northwestern pond turtles from the Contractor Use Areas.

1) At this time CO-retained environmental monitor will conduct focused surveys for northwestern pond turtles.

b. Four (4) days before beginning work in or near turtle habitat: If preconstruction surveys detect turtles in the Contractor Use Area, install and maintain exclusion fencing in accordance with Section 01 57 67 - Temporary Preservation Fence.

c. Three (3) days before beginning work in or near turtle habitat: For three (3) days prior to construction activities (one survey each day), CO-retained environmental monitor will survey the Contractor Use Area for northwestern pond turtles and relocate turtles found within the Contractor Use Area to the nearest suitable habitat outside the Contractor Use Area, and away from the exclusion fencing.

d. Restore affected northwestern pond turtle habitat site to its original contours as directed by the COR.

11. Central Valley Steelhead, Central Valley Spring-run Chinook and Sacramento River Winter-run Chinook:

a. "Reasonable and Prudent Measures and Conservation Measures" to protect listed anadromous fish are discussed in the NMFS BO.

1) The CO will provide a copy of this document to the Contractor, and the Contractor shall comply with these measures.

2) These measures include, but are not limited to, the following:

a) Participate in a Worker Environmental Education Program.

b) Observe work and exclusion zones in areas that support sensitive resources.

c) Conduct instream work and other activities that could harm anadromous fish from May 1 to November 1, except do not conduct work involving percussive impacts (e.g. hoe ram) from September 1 to November 1.

d) Remove debris in the stream channel resulting from construction activities and deposit off site.

i. Remove debris that has the potential to affect conditions supporting upstream migration of adult steelhead and Chinook salmon at minimum flow releases from upstream dams. Remove debris that has the potential to adversely modify spawning (e.g. armoring) or rearing habitat.

ii. Any material left in the stream shall not impair flows or fish passage.

3) A CO retained environmental monitor will inspect the stream channel and confirm the restoration of habitat conditions.

D. CO-retained environmental monitors and construction inspectors will routinely inspect protected areas to ensure that protective measures are in place and are effective.

1.8 PROTECTION AND REMOVAL

A. Protective measures shall remain in place until construction activities have been completed.

PART 2 PRODUCTS

2.1 FENCING

A. Refer to Section 01 57 67 - Temporary Preservation Fence.

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 57 67

TEMPORARY PRESERVATION FENCE

PART 1 GENERAL

1.1 1.01 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

PART 2 PRODUCTS

2.1 PRESERVATION/VEGETATION PROTECTION FENCE

A. Fence:
   1. High-density polyethylene grid.
   2. Minimum Height: 48-inch.
   3. Color: Safety orange.
   4. Mesh Opening: Approximately 1- by 4-inch.

B. Posts: Steel fence posts.

C. Fasteners: Metal clips, wire ties, or plastic zip ties.

2.2 EXCLUSION FENCE

A. Fence:
   1. Material: Hardware cloth exclusion fencing.
   2. Minimum Height: 48-inch.
   3. Mesh Opening: 1/4-inch.

B. Posts: Steel fence posts.

C. Fasteners: Metal clips, wire ties, or plastic zip ties.

PART 3 EXECUTION

3.1 LOCATION

A. Environmentally sensitive areas as specified in Section 01 57 66 - Environmental Protection of Species and Habitats.

B. Other Areas: As determined by COR.

3.2 PRESERVATION/VEGETATION PROTECTION FENCE INSTALLATION

A. Preservation fencing shall be installed around elderberry shrubs. The CO-retained environmental monitors will demarcate these features with flagging prior to the contract.

1. Erect vegetation protection sign every 50 feet along vegetation protection fence at all protected elderberry shrubs.
2. Signs shall read “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. The Endangered Species Act of 1973, as amended, protects this species. Violators are subject to prosecution fines, and imprisonment.”

B. Location:

1. <UPDATE AFTER STUDIES COMPLETE>

C. Installation:

1. Space steel posts 10-feet, maximum, on center.
2. Secure preservation fence to steel posts.
3. Use additional steel posts as needed to ensure that the preservation fence will remain upright and not fall over.

3.3 EXCLUSION FENCE INSTALLATION

A. Location:

1. In areas identified by the CO as habitat for foothill yellow-legged frog and/or northwestern pond turtle, install exclusion fencing in a manner that will exclude frogs and turtles from entering the Contractor Use Areas.
2. Areas requiring exclusion fence installation will be based on preconstruction surveys to be performed by the CO-retained environmental monitor.

B. Installation:

1. Bury lower portion of hardware cloth fence to a depth of 6 inches.
2. Secure hardware cloth fence to steel posts.
3. Use additional steel posts as needed to ensure that the hardware cloth fence will remain upright and not fall over.

3.4 MAINTENANCE AND REMOVAL

A. Maintain fence until work in Contractor Use Area is complete and accepted by the COR.

B. Remove fence fabric, posts, and fasteners when no longer required.

END OF SECTION

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SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 DEFINITIONS

A. Essential Characteristics: As used in these specifications, the term "essential characteristics" is synonymous with the term "salient characteristics."

B. Salient Characteristics: Those qualities of an item that are essential to ensure that the intended use of the item can be satisfactorily realized.

1.3 REFERENCE STANDARDS

A. See specific standards in relative specification sections.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Transport and handle manufactured products in accordance with manufacturer's instructions.

B. Store and protect manufactured products in accordance with manufacturer's instructions. Obtain instructions from the manufacturer before delivery of materials to jobsite. Maintain a copy of instructions at jobsite.

C. Protect materials from adverse effects of moisture, sunlight, ultraviolet light, or weather during storage at jobsite.

D. Remove and replace damaged items with new items.

E. Store curing compounds, sealants, adhesives, paints, coatings, sealers, joint compounds, grouts, and similar products at the temperature and environmental conditions recommended by manufacturer.

1.5 MAINTENANCE

A. Extra Materials:

1. Furnish additional maintenance materials specified as "extra materials" or “spare parts” in the specifications. Provide maintenance material identical to installed material and provide from the same manufacturer's production lot as installed material.
2. Package extra materials for storage and label with complete product identification on packaging.
3. Deliver extra materials to the COR at jobsite and place in storage as directed by the COR.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide materials required for completion of work.

B. Provide type and quality described in these specifications. Make diligent effort to procure specified materials from all available sources.

C. Furnish new materials conforming to referenced standards unless otherwise specified.

D. For materials not covered by these or referenced specifications, furnish materials of standard commercial quality.

E. If materials to be used deviate from or are not covered by recognized specifications and standards, submit, for approval, justification for and exact nature of the deviation, and complete specifications for materials proposed for use.

2.2 SUBSTITUTIONS

A. Obtain written approval to use substitute materials from the COR. State in the request for approval the amount of the adjustment, if any, to be made in favor of the CO.

B. The COR determination as to whether substitution will be permitted and as to what substitute materials may be used, shall be final and conclusive.

C. If approved substitute materials are of less value to the CO or involve less cost to the Contractor than specified material, a contract adjustment will be made in favor of the CO. Where the amount involved or the importance of substitution warrants, a deductive modification to the contract will be issued.

D. No payments in excess of prices offered in the Price Schedule will be made because of substitution of one material for another or because of use of one alternate material in place of another.

2.3 WORKMANSHIP

A. Accurately manufacture and fabricate materials in accordance with best modern practice and requirements of these specifications, notwithstanding minor errors or omissions therein.

B. Use liberal factors of safety and adequate shock-absorbing features in designs, especially for parts subjected to variable stress or shock, including alternating or vibrating stress or shock.

C. Include provisions which prevent components from loosening for shock-absorbing features and parts subject to vibration.

A. Inspection of materials at locations specified above or waiving of inspection shall not be construed as being conclusive as to whether materials and equipment conform to contract requirements nor shall the Contractor be relieved thereby of the responsibility for furnishing materials meeting the requirements of these specifications.

B. Acceptance of materials will be made only at the jobsite.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's recommendations unless otherwise specified.

3.2 FIELD QUALITY ASSURANCE

A. Final inspection and acceptance of materials will be made only at the jobsite after installation and testing.

END OF SECTION

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SECTION 01 71 20
SURVEYING

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:

1. Include in prices offered in the Price Schedule for other items of work.

1.2 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 71 20-1, Resume:

1. Qualifications of engineer or surveyor responsible for supervising and directing survey work.

C. RSN 01 71 20-2, Electronic Data:

1. Electronic data files.

1.3 PRIMARY CONTROL

A. The CO has established primary control to be used for establishing work lines and grades.

B. Primary control consists of bench marks and horizontal control points in work vicinity.

C. California Code of Regulations (CCR)1. Title 22, Division 4.5.

D. A complete list and identification of primary control are provided in the Contract Drawings.

E. Check and verify primary control and resolve discrepancies with COR before beginning work.

F. Preserve and maintain primary control points until otherwise authorized. CO may reestablish damaged or destroyed primary control points and backcharge reestablishment cost to the Contractor.

1.4 QUALIFICATIONS

A. Surveyors: Experienced construction surveyors under supervision and direction of licensed surveyor with minimum of 2 years experience in charge of construction surveys for construction similar in nature to that required by this contract.

PART 2 PRODUCTS

2.1 SURVEYING MATERIALS AND EQUIPMENT

A. Provide materials and equipment required for surveying work, including, but not limited to, instruments, stakes, spikes, steel pins, templates, platforms, and tools.

B. Except as required to be incorporated in work or left in place, surveying materials and equipment will remain property of Contractor.

PART 3 EXECUTION

3.1 LAYOUT OF WORK SURVEYS

A. Establish lines and grades for work layout from the established primary control points.

B. Establish measurements required for work execution to specified tolerances.

C. Provide stakes, markers, and other survey controls necessary to control, check, and guide construction.

D. Alignment Staking/Marking: Each 10 feet.

E. Slope Staking/Marking: Each 10 feet.

F. Markings (e.g. spray paint) must be minimized and may be required to be removed by the Contractor as directed by the COR.

3.2 QUANTITY SURVEYS

A. No quantity surveys are expected.

3.3 SURVEY REQUIREMENTS

A. Structures: Stake out of structures and checkouts before and during construction.

B. As-builts:

1. Under direction of the Fish Passage Engineer, complete an as-built survey.
2. In general, the survey will be within the modified channel reach and will include longitudinal profiles along several flow paths (approximately four (4)) and

sections at hydraulic control features. The final number of profiles and sections will be at the discretion of the Fish Passage Engineer.

3.4 FIELD RECORDS

A. Record original field notes, computations, and other surveying data in fieldbooks.

B. Record survey data in accordance with recognized professional surveying standards.

1. Notes or data not in accordance with standard formats will be rejected.
2. Illegible notes or data or erasures on any page of a fieldbook will be sufficient cause for rejection of part or all of a fieldbook.
3. Corrections by ruling or lining out errors will be permitted. Corrections shall be initialed by surveyor making the correction.
4. Copied notes or data will not be permitted.
5. Rejection of part or all of a fieldbook may necessitate resurveying.

C. Data and notes may be collected on electronic data collection devices with prior approval of the COR.

1. Electronic Files of Notes: In approved format.
2. Include electronic files and paper copies of notes in submittals.

END OF SECTION

SECTION 01 78 30

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 07 78 30-1, Final As-built Drawings:
   1. Certified marked sets.

1.3 RECORD DRAWINGS

A. Maintain 2 sets of full-size prints (23-inches by 34-inches) of contract drawings marked to show accurate and complete records of as-built conditions. Keep drawings at the jobsite and mark as work progresses.
   1. Mark and dimension to show variations between actual construction and that indicated or specified in contract documents.
      a. Include buried or concealed construction and utilities.
      b. Include existing items, topographic features, and utility lines revealed during construction which differ from those shown on contract drawings.
   2. Mark to define construction actually provided where choice of materials or methods is permitted in specifications, or where variations in scope or character of work from that of the original contract are authorized.

B. Use standard drafting practice to represent changes and include supplementary notes, legends, and details necessary to clearly portray as-built construction.

C. Mark as-built drawings in the following colors:
   1. Red - Additions to original drawings.
   2. Green - Deletions to original drawings.
   3. Blue - Notations necessary for explanation of as-built markings.

D. Allow the COR to review the drawings at all times.

E. Upon completion of work, sign marked prints as certified correct.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

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SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Demolition includes any work required to move or modify rock within the project sites. This includes, but is not limited to, scaling of rock, splitting of rock, hoisting of rock, and clearing and grubbing.

B. The Contractor may use hydraulic splitters, pneumatic hammers, controlled blasting, or other demolition techniques authorized to fracture rock.

C. If explosives will be used, the Contractor must install, maintain, and remove after construction vibration monitoring equipment. The Contractor must also collect, interpret and report data from the vibration monitoring instrumentation. The purpose of the vibration-monitoring program is to protect the Eagle Canyon Diversion Dam from excess vibration during demolition. Therefore, vibration monitoring will be conducted at Eagle Canyon Diversion Dam.

1.2 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.3 REFERENCES

A. Comply with Federal, State, and local regulations.

B. Occupational Safety and health Administration (OSHA)
   1. 29 CFR Part 1910 OSHA Occupational Safety and Health Standards
   2. 29 CFR Part 1926 OSHA Safety and Health Regulation for Construction

C. Applicable State Safety and Health Regulations – CAL/OSHA

D. California Code of Regulations (CCR) Title 8 & Title 22

E. CCR Title 8, Ch 4, Subchapter 7, Group 18

F. CCR Title 22, Division 4.5, Ch. 33

1.4 DEFINITIONS

A. Controlled blasting: Use of explosives and blasting accessories in predetermined

spaced and aligned drill holes to limit blast vibrations, noise from airblast overpressure, and flyrock.

B. Flyrock: Rock that becomes airborne due to blasting.

C. Near field blasting: Blasting within 30 feet of critical structure.

1.5 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 – Submittals.

B. RSN 01 35 20-1, Demolition Plan

1. The Demolition Plan must provide detailed descriptions of the demolition work to be completed including methods, equipment, materials, and safety procedures. The Demolition Plan must include details for splitting boulders, site stabilization (e.g. scaling), clearing and grubbing, and staging for these activities.

2. If explosives will be used, the Demolition Plan must present ground vibration monitoring information including the following:

   - The name of the Firm providing the vibration monitoring services.
   - Description of the instrumentation and equipment to be used.
   - Measurement locations and methods for mounting the vibration sensors.
   - Procedures for data collection and analysis.
   - Means and methods of providing warning when the Response Values, as specified in Article 3.07, are reached.
   - Generalized plans of action to be implemented in the event any Response Value, as specified in Article 3.07, is reached. The generalized plans of action shall be positive measures by the Contractor to control vibrations (e.g. using alternative construction methods).

3. If explosives will be used, the Demolition Plan must address the below items. If explosives will not be used, then explicitly state so in the Demolition Plan.

   - References to applicable federal, state, and local codes and regulations as they apply to the use of explosives.
   - Copies of permits required for blasting activities
   - Business name, contractor license number, address, and telephone number of the blasting subcontractor
   - Proof of current liability insurance and bonding
   - Name, address, telephone number, copies of applicable licenses, and resume of:
     - Blaster-in-charge
     - Personnel responsible for blast design, loading, and conducting blasting operations

        - Safety officer for blasting subcontractor
    - Name, address, and telephone number of the local fire station and law enforcement agencies
    - Detailed description of:
        - Location where explosives will be stored
        - Security measures to protect and limit access to the explosives
        - Transportation means for explosives
        - List of personnel permitted to handle the explosives
    - Exclusion zone and limited-entry zone for nonblast related operations and personnel surrounding loading and blasting operations
    - Details of warning signals used to alert employees on the job site of an impending blast and to indicate the blast is completed and the area is safe to enter
    - How blasting operations will be conducted
    - Measures to protect blasting operations and personnel from lightning
    - Emergency evacuation procedures for areas where explosives may be present
    - How misfires will be recognized, handled, and resolved including:
        - Who will be notified
        - How blast zone will be secured until misfire is resolved
        - Identification of equipment that may be needed to resolve misfires
    - Details of signs to be used around blasting zones including:
        - Timing of when signs will be posted relative to a specific blast
        - Name and telephone number of person responsible for placing signs
        - Roadway signs for compliance with Chapter 6, Typical Application 2, of the California MUTCD
    - Traffic control details for:
        - Loading and blasting operations
        - Misfire event or other blast related phenomenon that causes a transportation corridor to remain closed to the public
    - Description of possible noxious gas generation and details of safeguards to be used to protect employees, work zones adjacent to the shot, private property, and the public
    - Procedure to report and resolve complaints for blast related accidents

- Copies of each MSDS and manufacturer data sheets of explosives, caps, primers, initiators, and other compounds

C. RSN 02 41 00-2, Controlled Blasting Plan (if demolition will include blasting)

Submit a Controlled Blasting Plan for each blast. The Plan must include details on how each blast will be controlled and the following.

- Blast identification by numerical and chronological sequence
- Location, referenced to stationing, offset distance, date, and time of blast
- Drawings showing drill hole pattern, spacing, burden, and initiation sequence
- Typical cross-sections through zone to be blasted
- Groundwater level, if present, within the prism to be blasted
- Initiation-sequence diagram showing the actual firing time of each delay
- Type of material to be blasted
- Number of drill holes
- Diameter, depth, and spacing of holes
- Height or length of stemming
- Types and characteristics of explosives used, including explosive's density, relative strength, and date of manufacture
- Type of caps and delay periods used and their date of manufacture
- Total amount of explosives used
- Total amount of explosives detonating within any 8 millisecond period
- Powder factor (pounds of explosive per cubic yard of material blasted)
- Method of firing
- Direction and distance to nearest building or structure
- Type and method of instrumentation
- Location and placement of instruments
- Measures to limit air noise and flyrock
- Measures to limit overbreak
- Name of blasting subcontractor
- Name and signature of blaster-in-charge
- Drawings showing spacing and proximity of shot guards to blast location

Changes to the Controlled Blasting Plan made to adjust for site conditions must be submitted for review before implementing.

D. RSN 02 41 00-3, Video Recording of Blasts (if demolition will include blasting)

Video-record each blast. The video-recording must be taken from a safe location with a clear view of the blast area, activities, and progression. Identify each video or section of video with an index to identify each blast. Submit a copy of each video in DVD-Video format.

E. RSN 02 41 00-4, Vibration and Monitoring Reports (if demolition will include blasting)

Record each blast shot using approved seismographs and prepare a vibration and noise monitoring report. The report must include:

1. Identification of instruments used
2. Name of blast monitoring consultant
3. Distance and direction of recording stations from blast area
4. Type of ground at recording station and material on which instrument sits
5. Maximum particle velocity in each component and resultant peak particle velocity of each shot
6. Copy of seismograph readings with date and signature of blast monitoring consultant
7. Noise levels recorded in dB (C-network or Linear network) units

F. RSN 02 41 00-5, Postblast Reports (if demolition will include blasting)

Document each shot in a postblast report. The postblast report must include all data required in the controlled blasting plan for that shot and the following:

1. Description of site conditions, loading, and time of blast
2. Description of weather conditions at time of blast including wind direction and cloud cover
3. Drillers boring record
4. Copy of vibration and noise monitoring report
5. Copy of documented complaints arising from the blast

Submit the postblast report within 48 hours of the blast.

G. RSN 02 41 00-6, Blasting Complaints (if demolition will include blasting)

Accurately document each complaint, if any. Notify the COR immediately of a complaint received or at the start of the next day's work shift. Complaint documentation must include:

6. Name and address of complainant
7. Date, time, and nature of complaint

8. Dated photo or videotape of physical damage
9. Name of person receiving complaint
10. Record of complaint investigation conducted
11. Resolution of complaint

H. RSN 02 41 00-7, Vibration Monitoring Equipment Information (if demolition will include blasting)

Provide the following:

1. Submit manufacturer's product data describing all specified vibration-monitoring instruments.
2. Resumes of the vibration monitoring personnel.
3. A record of laboratory calibration for the vibration monitoring equipment.
4. Provide the monitoring details within the Demolition Plan

1.6 QUALITY CONTROL AND ASSURANCE

A. Blaster-In-Charge

Assign a blaster-in-charge responsible for supervising all blasting activities. The blaster-in-charge must have 10 years of experience in performing or supervising similar blasting activities and must be a licensed blaster.

B. Blast Monitoring Consultant

Assign a blast monitoring consultant to monitor blasting generated vibrations and noise near buildings and structures that may be subject to damage. The monitoring consultant must be responsible for collecting and interpreting vibration and noise data. The blast monitoring consultant must:

1. Not be employed by the blasting contractor or other subcontractor on the project
2. Have a minimum of a 2-year Associate's Degree in science or engineering
3. Have at least 5 years of documented experience in collecting and interpreting ground vibrations and noise data

C. Blasting Consultant

Assign a blasting consultant to oversee near field blasting activities. The blasting consultant must:

1. Be an Engineer or geologist who is licensed in the State
2. Have 10 years of experience providing specialized blasting services in near field blasting
3. Not be employed by the blasting contractor, explosive manufacturer, or explosive distributor
4. Submit a resume of credentials and a list of projects worked on.

D. Vibration and Noise Monitoring

1. The Contractor's vibration-monitoring personnel shall have the qualifications specified herein. These personnel may be on the staff of the Contractor or may be on the staff of a specialist subcontractor. However, they shall not be employed nor compensated by subcontractors, or by persons or entities hired by subcontractors, who will provide other services or material for the project.
2. Vibration levels must be kept below peak particle velocity of 2 inches per second at the nearest building or structure.
3. Noise from airblast overpressure levels must be kept below 128 dB (C-network or Linear network) at the nearest building
4. Ground vibrations and noise created from blasting must be controlled by using properly designed delay sequencing and charge weights for shots.
5. Provide 3 seismographs to be available for deployment that are appropriate for controlled blasting activities and capable of:
    - Recording particle velocities for 3 mutually perpendicular components of vibration and instantaneous resultant peak vector sum in the range generally found with controlled blasting.
    - Continuously measuring, recording, and reporting vibrations along 3 primary axes.
    - Measuring and recording vibration frequencies ranging from 2 to 300 Hz.
    - Providing a printed record of each event showing a plot of peak particle velocity versus vibration frequencies.
    - Measuring and recording airblast noise levels. The noise transducer must be detachable from the main unit to allow placing at elevations with a clear line of sight between transducer and blast.

PART 2 - PRODUCTS

2.1 BLASTING

A. The maximum diameter of explosives used in presplit holes must not be greater than 50 percent of the diameter of the presplit hole.

B. Only standard cartridge explosives prepared and packaged by explosive manufacturing firms must be used in the presplit holes. These must consist of one of the following:

1. Fractional portions of standard cartridges to be affixed to the detonating cord in the field
2. Solid column explosives joined and affixed to the detonating cord in the field

C. Stemming materials must be dry, free-running material meeting the grading requirements in the following table when tested under California Test 202:

Sieve sizes	Percentage passing
3/8"	100
No. 8	90

2.1 SEISMOGRAPHS

A. Provide portable seismographs for monitoring the velocities of ground vibrations resulting from construction activities. Provide model DS-477 Blastmate II as manufactured by Instantel Inc., Kanata (Ottawa), Ontario, Canada, model VMS-500 as manufactured by Thomas Instruments, Inc., Spofford, NH, or model NC5310/D, as manufactured by Nomis Inc., Birmingham, AL, or acceptable equivalent. The seismograph shall have the following minimum features:

1. Seismic range: 0.01 to 4 inches per second with an accuracy of $\pm$5 percent of the measured peak particle velocity or better at frequencies between 10 Hertz and 100 Hertz, and with a resolution of 0.01 inches per second or less.
2. Frequency response ($\pm$3 dB points): 2 to 200 Hertz.
3. Three channels for simultaneous time-domain monitoring of vibration velocities in digital format on three perpendicular axes.
4. Two power sources: internal rechargeable battery and charger and 115 volts AC. Battery must be capable of supplying power to monitor vibrations continuously for up to 24 hours.
5. Capable of internal, dynamic calibration.
6. Direct writing to printer and capability to transfer data from memory to 3-1/2 inch magnetic disk. Instruments must be capable of producing strip chart recordings of readings on site within one hour of obtaining the readings. Provide computer software to perform analysis and produce reports of continuous monitoring.
7. Continuous monitoring mode must be capable of recording single-component peak particle velocities, and frequency of peaks with an interval of one minute or less.

PART 3 - EXECUTION

3.1 GENERAL

A. The demolition work shown on the Contract Drawings is based on the best information available.

B. Inspect all work areas and determine the demolition work required to be performed prior

to commencing any earthwork.

C. Contractor shall provide safe access and comply with construction safety requirements.

D. Leave streambed in clean condition free from demolition debris. All debris shall be removed from the Project Site.

3.2 PROTECTION OF PROPERTY

A. Provide temporary barriers or barricades, as required and as approved by the COR, around the demolition work areas to warn personnel of excavations, trenches, and areas using explosives and to prevent unauthorized personnel and vehicles from entering the vicinity.

B. Protect all existing infrastructure and property.

3.3 BLASTING

A. Do not perform blasts within 1,200 feet of concrete placed within 72 hours.

B. Before firing any blast, confirm that groundwater conditions are consistent with shot design and explosive type to be used.

C. Before firing any blast in areas where flyrock may result in personal injury or damage to property or the work, cover the rock to be blasted with blasting mats, soil, or other equally serviceable material to prevent flyrock.

D. If blasting causes flyrock, suspend blasting activities. The blasting consultant must review the site to determine the cause of the flyrock problem and provide an amendment to the controlled blasting plan that prevents flyrock.

E. Do not use drill cuttings as stemming in controlled blasting operations.

F. Before drilling the presplitting holes, remove overburden soil and weathered rock along the top of the excavation for a distance of at least 50 feet beyond the drilling limits or to the end of the excavation. Ensure removal of overburden soil and weathered rock and expose fresh rock to an elevation equal to the bottom of the adjacent lift of the presplitting holes being drilled.

G. Drill slope holes for presplitting along the line of the planned slope within the tolerances specified. The drill holes must be at least 2-1/2 inches, but not more than 3 inches in diameter. Control the drilling operations by using proper equipment and techniques. Ensure no hole deviates from the plane of the planned slope by more than 12 inches or from parallel to an adjacent hole by more than 67 percent of the planned horizontal spacing between holes.

H. The length of presplit holes for an individual lift must not exceed 30 feet, unless you can demonstrate to the COR that you can stay within the above tolerances and produce a uniform slope. The length of holes may then be increased to a maximum of 60 feet if authorized.

I. The spacing of presplit holes must not exceed 3 feet on centers and must be adjusted to produce a uniform shear face between holes.

J. The COR may order you to drill auxiliary holes along the presplit line. These holes must not be loaded or stemmed. Except for spacing, auxiliary drill holes must comply

with the specifications for presplit holes. Drilling auxiliary drill holes along the presplit line is change order work.

K. Place the adjacent line of production holes inside the presplit lines in such a manner that avoids damage to the presplit face.

L. If necessary to reduce shatter and overbreak of the presplit surface, the 1st line of production holes must be drilled parallel to the slope line at the top of the cut and at each bench level thereafter.

M. Blasting techniques that result in damage to the presplit surface must be discontinued immediately.

N. No portion of the production holes must be drilled within 8 feet of a presplit plane unless authorized. The bottom of the production holes must not be lower than the bottom of the presplit holes.

O. A maximum offset of 24 inches will be permitted for a construction working bench at the bottom of each lift for use in drilling the next lower presplitting pattern.

P. Adjust the drilling operations to compensate for drift of previous levels and for the offset at the start of new levels to maintain the specified slope plane.

Q. If the methods of drilling and blasting do not produce the desired result of a uniform slope and shear face without overbreak and within the tolerances specified, drill, blast, and excavate in short sections, up to 100 feet, until a technique produces desired results.

R. If a fractional portion of a standard explosive cartridge is used, the cartridge must be firmly affixed to a length of detonating cord equal to the depth of the drill hole so that the cartridge does not slip down the detonating cord nor cock across the hole and bridge the flow of stemming material. Spacing of cartridges along the length of the detonating cord must not exceed 30 inches center to center and must be adjusted to give the desired results.

S. If a solid column type explosive is used, the column must be assembled and affixed to the detonating cord to comply with the explosive manufacturer's instructions. Submit as an informational submittal a copy of the explosive manufacturer's instruction before using the column type explosive.

T. The bottom charge of a presplit hole may be larger than the line charges but must not cause overbreak. The top charge of the presplitting hole must be placed far enough below the collar to avoid overbreaking the surface.

U. Before placing the charge, the hole must be free of obstructions for the hole's entire depth. Ensure placing of the charge does not cause caving of material from the walls of the holes.

V. The COR may order the use of stemming materials as necessary to achieve a satisfactory presplit face. Stemmed presplit holes must be completely filled to the collar.

W. Detonate charges in each presplitting pattern simultaneously.

X. The tolerances in section 19-2.03G do not apply to presplit surfaces of excavation

slopes where presplitting is required. The presplit face must not deviate more than 1 foot from the plane passing through adjacent drill holes, except where the character of the rock is such that irregularities are unavoidable. The average plane of the completed slopes must not deviate more than 1 foot from the plan slopes. These tolerances are measured perpendicular to the plane of the slope. No portion of the slope may encroach on the roadbed.

Y. If equally satisfactory presplit slopes are obtained, you may either presplit the slope face before drilling for production blasting or presplit the slope face and production blast at the same time, provided that the presplitting drill holes are fired with zero delay. The production holes must be delayed by at least 50 milliseconds starting at the row of holes farthest from the slope and progressing in steps to the row of holes nearest the presplit line. The presplitting holes must extend either to the end of the excavation or for a distance of not less than 50 feet beyond the limits of the production holes to be detonated.

3.4 VIBRATION MONITORING (If explosives will be used)

A. Installation of Seismographs Install where directed by the COR and in coordination with PG&E.

B. Field Calibration and Maintenance

1. The Contractor's instrumentation personnel shall conduct regular maintenance of seismograph installations.
2. All seismographs shall have been calibrated by the manufacturer or certified calibration laboratory within one year of their use on site. A current certificate of calibration shall be submitted to the COR with the Contractor's data.

C. Data Collection

1. The Contractor shall collect seismograph data prior to any vibration-producing demolition or construction activities to document background vibrations at each monitoring location. This monitoring shall consist of a continuous recording of the maximum single- component peak particle velocities for one-minute intervals, which shall be printed on a strip chart. The background monitoring shall be performed for a minimum of two non-consecutive workdays, spanning the hours during which demolition and construction activities will take place.
2. The Contractor shall monitor vibration during demolition and other significant vibration- producing construction activities as determined by the COR. This monitoring shall consist of a continuous recording of the maximum single-component peak particle velocities for one-minute intervals, which shall be printed on a strip chart. During the monitoring, the Contractor shall document all events that are responsible for the measured vibration levels, and submit the documentation to the COR. A record form for documenting these events is attached.
3. All vibration monitoring data shall be recorded contemporaneously and plotted continuously on a graph by the data acquisition equipment. Each graph shall show time- domain wave traces (particle velocity versus time) for each transducer with

the same vertical and horizontal axes scale.

4. The Contractor shall notify the COR at least 24 hours prior to starting a new vibration-producing construction task, and shall have the seismographs in place and functioning properly prior to any such activity within 200 feet of the monitoring locations. No significant vibration-producing activity shall occur within this zone unless the monitoring equipment is functioning properly.
5. The equipment shall be set up in a manner such that an immediate warning is given when the peak particle velocity in any direction exceeds the Response Values specified. The warning emitted by the vibration-monitoring equipment shall be instantaneously transmitted to the responsible person designated by the Contractor by means of warning lights, audible sounds or electronic transmission.

D. Data Reduction, Processing, Plotting, and Reporting

1. Within 10 working days after the completion of the background vibration monitoring, the Contractor shall submit to the COR a hard copy report documenting the results at each of the monitoring locations.
2. During bridge demolition and construction, the Contractor shall provide weekly, hard copy reports summarizing any vibration monitoring data collected at the specified vibration-monitoring locations. The reports for each week shall be submitted on or before the end of the following week.
3. All reports shall be signed by the approved Vibration Instrumentation COR, and shall include the following:
    a. Project identification, including District, County, Route, Post Mile, Project Name and Bridge number as shown on the project plans.
    b. Location of the monitoring equipment, including address of adjacent building.
    c. Location of vibration sources (e.g. traffic, demolition equipment, etc.)
    d. Summary tables indicating the date, time and magnitude and frequency of maximum single-component peak particle velocity measured during each one-hour interval of the monitoring period.
    e. Field data forms (construction vibration monitoring only).
4. Appendix graphs of the strip charts printed during the monitoring periods.
5. In addition to the hard copy data specified herein, the Contractor shall provide data on DVD disc with each report. Electronic data files for all instrument data shall be provided in Excel (.xlsx) format.

E. Damage to Instrumentation

1. The Contractor shall protect all instruments and appurtenant fixtures, leads, connections, and other components of vibration-monitoring systems from damage due to construction operations, weather, traffic, and vandalism.
2. If an instrument is damaged or inoperative, the Contractor’s instrumentation personnel shall repair or replace the damaged or inoperative instrument within 72 hours at no additional cost to the CO. The Contractor shall notify the COR at least 24 hours prior to

repairing or replacing a damaged or inoperative instrument. The COR will be the sole judge of whether repair or replacement is required.

F. Disclosure of Data

The Contractor shall not disclose any instrumentation data to third parties and shall not publish data without prior written consent of the CO.

G. Implementing Plans of Action

1 The Contractor shall interpret the data collected, including making correlations between seismograph data and specific construction activities. The data shall be evaluated to determine whether the measured vibrations can be reasonably attributed to construction activities.

a. The Response Values for vibration include a Threshold Value of 0.2 inches per second and a Limiting Value of 0.3 inches per second. The actions associated with these Response Values are defined below. Plans for such actions are referred to herein as plans of action, and actual actions to be implemented are referred to herein as response actions. Response Values are subject to adjustment by the COR as indicated by prevailing conditions or circumstances.

2 If a Threshold Value is reached, the Contractor shall:

b. Immediately notify the COR.

c. Meet with the COR to discuss the need for response action(s).

d. If directed by the COR during the above meeting that a response action is needed, submit within 24 hours a detailed specific plan of action based as appropriate on the generalized plan of action submitted previously as part of the vibration-monitoring plan specified in Article 1.05.

e. If directed by the COR, implement response action(s) within 24 hours of submitting a detailed specific plan of action, so that the Limiting Value is not exceeded

3 If a Limiting Value is reached, the Contractor shall:

a. Immediately notify the COR and suspend activities in the affected area, with the exception of those actions necessary to avoid exceeding the Limiting Value.

b. Meet with the COR to discuss the need for response action(s).

c. If directed by the COR during the above meeting that a response action is needed, submit within 24 hours a detailed specific plan of action based as appropriate on the generalized plan of action submitted previously as part of the vibration-monitoring plan specified in Article 1.05.

d. If directed by the COR, implement response action(s) within 24 hours of submitting a detailed specific plan of action, so that the Limiting Value is not exceeded.

3.5 DISPOSAL OF DEMOLITION DEBRIS

A. See Section 31 23 90 Disposal of Excavated Materials

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCEMENT AND ANCHORAGE

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. The Contractor shall furnish, fabricate, and install all reinforcement steel shown in the Contract Drawings. The work shall further include the furnishing and installation of all wires, clips, supports, chairs, spacers, and other appurtenances necessary to fulfill the requirements of the Specifications and produce finished concrete structures in accordance with the best engineering practice.

1.2 MEASUREMENT AND PAYMENT

A. Cost:

1. Refer to Section 01 20 00 Measurement and Payment.

1.3 SITE CONDITION

A. Contractor shall review the Contract Drawings to verify existing site conditions and accept as is. Contractor shall immediately report to the COR, any conditions believed to be detrimental to timely and proper completion of the work, and correct such conditions with approval by the COR.

1.4 REFERENCES

A. Materials and work provided under this section shall conform to the following references as applicable:

1. ASTM A-615

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Reinforcement Steel shall be Grade 60 billet steel conforming to ASTM A-615.

PART 3 EXECUTION

3.1 INSTALLATION

A. Reinforcement steel rebar shall be placed in locations shown in the Contract Drawings. Rebar shall be maintained in proper position by bar supports, or other approved devices.

****END OF SECTION****

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1: GENERAL

PART 1 GENERAL

1.1 Description of Work

A. The Contractor shall provide all labor, materials, tools, equipment, supervision, and incidentals necessary to install and complete all Portland Cement Concrete as shown on the Contract Drawings and/or specified herein. Additional concrete requirements may be listed on the Contract Drawings.

1.2 MEASUREMENT AND PAYMENT

B. Cost:

1. Refer to Section 01 20 00 Measurement and Payment.

1.3 SUBMITTALS

B. Submit the following in accordance with Section 01 33 00 - Submittals.

C. RSN 03 30 00-1, Concrete Design and Strength Data

1. Contractor shall submit concrete mix designs and strength data for approval.

D. RSN 03 30 00-2, Concrete Supplier

1. Contractor shall submit the name(s) of the concrete supplier's contact information including address, telephone numbers, and the name of the responsive person at the point of supply.

E. RSN 03 30 00-3, Concrete Delivery Tickets

1. Each batch of ready-mixed concrete delivered to the job site shall be accompanied by a ticket furnished to the COR which shows the volume of concrete and the weight of all ingredients in pounds. The ticket shall also show the time of day the materials were batched.

1.4 References

A. Materials and work provided under this section shall conform to the following references as applicable:

1. ASTM C33 – Concrete Aggregates
2. ASTM C94 – Ready-Mixed Concrete
3. ASTM C143 – Slump of Hydraulic-cement Concrete
4. ASTM C150 – Portland Cement
5. ASTM C260 – Air-entraining Admixtures for Concrete
6. ASTM D98 – Calcium Chloride

1.5 SITE CONDITION

A. Contractor shall review the Contract Drawings to verify existing site conditions and accept as is. Contractor shall immediately report to the COR, any conditions believed to be detrimental to timely and proper completion of the work, and correct such conditions with approval by the COR.

PART 2: PRODUCTS

PART 2 PRODUCTS

2.1 GENERAL

A. **Concrete and mortar shall be composed of cement, aggregates, water and specified** admixtures of the qualities and proportions specified herein. All ingredients shall be well mixed and brought to the proper consistency. Approval and use of any **ADMIXTURE OR AIR-ENTRAINING AGENT MUST BE OBTAINED FROM THE COR PRIOR TO ITS BEING** included in the mix.

2.2 CEMENT

A. All cement used on the work shall be standard brand Portland cement conforming to the "Specification for Portland Cement" (ASTM C150), Type II. A single brand of cement shall be used throughout the work, and prior to its use, the brand shall be approved by the COR. The cement shall be suitably protected from exposure to moisture until used. Cement that has become lumpy shall not be used. Sacked cement shall be piled so as to permit access for tally, inspection, and identification of each shipment.

2.3 AGGREGATES

A. All aggregates used in this work shall conform to the "Standard Specifications for Concrete Aggregate" (ASTM C33). They shall be in a saturated, surface dry condition when used, and the maximum size of coarse aggregate shall be 1-inch, or as directed by the COR.

2.4 WATER

A. Water used in mixing concrete or mortar shall be clean and free from injurious quantities of silt, organic matter, sulfates, alkali, salts, oil, and other impurities. The water shall contain no minerals which would cause staining or discoloration of the concrete or mortar.

2.5 ADMIXTURE

A. At the Contractor's option, and only if advance approval is obtained from the COR, but in either case at the expense of the Contractor, an admixture may be added to the concrete to control the set, effect water reduction and increase workability.

2.6 AIR-ENTRAINING AGENT

B. An air-entraining agent meeting the requirements of "Specifications for Air-entraining Admixtures for Concrete" (ASTM C260) shall be used. Sufficient air-entraining agent shall be used to provide a total air content of 4 to 6 percent. The COR reserves the right, at any time, to sample and test the air-entraining agent received on the job by the Contractor. In no event shall any of said agent be used

for work under the Contract without approval by the COR. The air-entraining agent shall be added to the batch in a portion of the mixing water. The solution shall be batched by means of a mechanical batcher capable of accurate measurement.

2.7 CALCIUM CHLORIDE

C. The use of calcium chloride in concrete will not be permitted.

2.8 CONCRETE PH REDUCER

A. Concrete pH reduce by EnviroSafe Manufacturing Corp. or approved equal.

PART 3: EXECUTION

PART 3 EXECUTION

3.1 PREPARATION OF SUITABLE SURFACES FOR CONCRETING

A. General - No concrete shall be placed until all form work, installation of parts to be embedded, and preparation of surfaces involved in the placing have been approved by the COR. All surfaces of forms and embedded items that have become encrusted with dried grout from concrete previously placed shall be cleaned of all such grout before the surrounding or adjacent concrete is placed.

B. Wetting - Earth surfaces shall be thoroughly wetted by sprinkling prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. The surface shall be free from standing water, mud, gravel, sand, and debris at the time of placing concrete.

C. At boulder/concrete interfaces, the boulder face shall be cleaned by abrasive blasting or other approved means to remove all laitance, expose, but not undermine the boulder, and roughen the surface to a minimum ¼-inch amplitude.

D. Excavation of gravels to expose a suitable surface must be completed through manual means.

3.2 PROPORTIONS

A. The concrete required under these Specifications shall be designed to produce a concrete capable of being deposited so as to obtain maximum density and minimum shrinkage and, where deposited in forms, to have maximum smoothness of surface. The mix design shall be subject to the approval of the COR and any adjustments in mix ordered by the COR shall be made at no additional cost to the COR.

B. Concrete - The minimum compressive strength and cement content of concrete shall be not less than that shown in the following tabulation. The maximum aggregate size shall not exceed 1".

Class of Concrete	Type of Work	Cement per Cubic Yard (Lbs.)	W/C Ratio (Max)	Minimum 28-day Compressive Strength (psi)
A	Misc. Sitework	564	0.5	3,000
B	All Reinforced Concrete	564	0.45	4,000

C. Consistency – The proportions used shall be those that result in a concrete which can be worked properly into place without segregation, and which can be compacted by the vibratory methods herein specified to give the desired density, impermeability and smoothness of surface. The quantity of water shall be changed as necessary, at the request of the COR, with variations in the nature or moisture content of the aggregates, to maintain uniform production of a desired consistency. The consistency of the concrete in successive batches shall be determined by the "Method of Test of Slump of Portland Cement concrete" (ASTM C143). The slumps to be used will be determined by the COR for the various parts of the work, but in general, they shall be as follows:

Class of Concrete	Slump	
	Maximum Inch	Minimum Inch
A	4	2
B	3	2

D. Measurement - All ingredients of concrete shall be measured with equipment capable of delivering accurately the design mix proportions to each batch.

3.3 MIXING

A. The cement, sand, and coarse aggregate shall be so mixed and the quantity of water added shall be such as to produce a homogeneous mass of uniform consistency.

B. Dirt and other undesirable substances shall be carefully excluded.

C. All concrete shall be thoroughly mixed in a batch mixer so designed to positively ensure a uniform distribution of all of the component materials throughout the mass during the mixing operation.

D. Only sufficient water shall be used in mixing to give a workable mix, conforming to the consistency requirements of these Specifications.

E. The mixing of each batch shall continue not less than 1-1/2 minutes after all materials, including water, are in the mixer, during which time the mixer shall rotate at the speed for which it has been designed or at such speed as will produce a mass of uniform consistency at the end of the mixing period.

F. Wherever necessary to secure proper results, the concrete shall be mixed for a longer period than herein specified, but over mixing of concrete, or overloading of mixers shall not be permitted.

G. Hardened concrete shall not be permitted to accumulate on the inner surfaces of the mixer.

H. Retempering, i.e., remixing with the addition of water to concrete that has been partially hardened will not be permitted.

3.4 READY-MIXED CONCRETE

A. Ready-mixed concrete shall meet the requirements as to materials, batching, mixing, transporting, and placing specified herein and in the requirements of the "Specifications for Ready-mixed Concrete" (ASTM C94), including the supplementary requirements specified herein.

B. Delivery Conditions - Ready-mixed concrete shall be delivered to the site of the work and discharge shall be completed within one hour after the addition of the cement to the aggregates or before the drum has been revolved 250 revolutions, whichever is first. In hot weather, or under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85^{o} or above, the time between the introduction of the cement to the aggregate and discharge shall not exceed 30 minutes.

C. Truck Mixers - Truck mixers shall be equipped with electrically actuated counters by which the number of revolutions of the drum or blades may be readily verified. The counter shall be of the resettable, recording type, and shall be mounted in the driver's cab. The counters shall be actuated at the time of starting mixers at mixing speeds.

D. Mixing Requirements - Each batch of concrete shall be mixed in a truck mixer for not less than 70 revolutions of the drum or blades at the rate of rotation designated by the manufacturer of the equipment. Additional mixing, if any shall be at the speed designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of revolutions of mixing.

E. Quality - Truck mixers and their operation must be such that the concrete throughout the mixed batch as discharged is within acceptable limits of uniformity with respect to consistency, mix and grading. If slump tests taken at approximately the 1/4 and 3/4 points of the load during discharge give slumps differing by more than one inch when the specified slump is three inches or less, or if they differ by more than two inches when the specified slump is more than three inches, the mixer shall not be used on the work unless the causing condition is corrected and satisfactory performance is verified by additional slump tests. All mechanical details of the mixer, such as water measuring and discharge apparatus, condition of the blades, speed of rotation, general mechanical condition of the unit, and clearance of the drum, shall be checked before a further attempt to use the unit will be permitted.

F. Restrictions - The use of non-agitating equipment for transporting ready-mixed concrete will not be permitted. Combination truck and trailer equipment for transporting ready-mixed concrete will not be permitted. The quality and quantity of materials used in ready mixed concrete and in batch aggregates shall be subject to continuous inspection at the batching plant by the COR.

3.5 PLACING CONCRETE

A. General - Concrete which, upon or before placing, is found not to conform to the requirements specified herein shall be rejected and immediately removed from the site. Concrete which is not placed in accordance with these Specifications, or which is of inferior quality as determined by the COR, shall be removed and replaced by, and at the expense of, the Contractor. Concrete shall not be placed when unsuitable heat or wind conditions will prevent proper placement and curing, as determined by the COR. The Contractor shall give the COR 24 hours notice prior to placing any concrete.

B. Method - Concrete shall not be dropped through reinforcement steel or into any deep form whether reinforcement is present or not, causing separation of the coarse aggregate from the mortar on account of repeatedly hitting rods or the sides of the form as it falls, nor shall concrete be placed in any form in such a manner as to leave an accumulation of mortar on the form surfaces about the placed concrete. In such cases some means such as the use of hoppers and, if necessary, vertical ducts of canvas, rubber, or metal shall be used for placing concrete in the forms in a manner that it may reach the place of final deposit without separation. In no case shall the free fall of concrete exceed four feet below the ends of ducts, chutes, or buggies. Concrete shall be uniformly distributed during the process of depositing and in no case after depositing, shall any portion be displaced in the forms more than six feet in horizontal direction. Concrete in forms shall be deposited in uniform horizontal layers not deeper than two feet, and care shall be taken to avoid included layers or inclined construction joints except where such are required for sloping members. Each layer shall be placed while the previous layer is still soft.

C. Equipment - All ends of chutes, hopper gates, and all other points of concrete discharge throughout the Contractor's conveying, hoisting and placing system shall be so designed and arranged that concrete passing from them will not fall separated into whatever receptacle immediately receives it. Adequate head room provisions must be made at such points for a vertical drop and for proper baffling. Conveyor belts, if used, shall be of a type approved by the COR. Chutes longer than 50 feet will not be permitted. Minimum slopes of chutes shall be such that concrete of the specified consistently will readily flow in them. If a conveyor belt is used, it shall be wiped clean by a device operated in such a manner that none of the mortar adhering to the belt will be wasted. All conveyor belts and chutes shall be covered. Sufficient illumination shall be provided in the interior of all forms so that the concrete at the places of deposit is visible from the deck or runway.

3.6 TAMPING AND VIBRATING

A. General - As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted, throughout the entire depth of the layer which is being consolidated, into a dense, homogenous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a light excess of water to the exposed surface of concrete during placement.

3.7 CURING AND WATERPROOFING

A. The concrete shall be cured for not less than 7 days after placing, by wetting wooden forms immediately after pouring concrete and keeping forms wet during curing process. Concrete structures to be completely buried may be cured by covering the surfaces of the concrete with moist earth for not less than four hours, and no more than 24 hours after the concrete is placed.

3.8 CARE AND REPAIR OF CONCRETE

A. The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, over stress, or any other cause until final acceptance by the COR. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which for any other reason does not conform to the Contract Drawings and Specifications, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the Contractor's expense.

3.9 CONCRETE PH REDUCER

A. Apply within 30 days of casting concrete and prior to being exposed to any creek flow.

B. Apply per the manufacture recommendations.

****END OF SECTION****

SECTION 31 02 10

WATER FOR DUST ABATEMENT

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 REFERENCE STANDARDS

A. State of California, Department of Transportation (Caltrans), Standard Specifications Section 18, “Dust Palliatives.”

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 APPLYING WATER FOR DUST ABATEMENT

A. Provide water in accordance with Section 01 51 00 - Temporary Utilities.

B. Refer to Section 01 57 20 – Environmental Controls for additional dust management details.

C. Provide means of conveying water to point of use and applying water.

D. Use pressure spray or distributor bar to apply water evenly.

E. Apply water for dust abatement as directed by the COR.

F. Apply water for dust abatement for protection of elderberry shrubs in accordance with Section 01 57 66 - Environmental Protection of Species and Habitats.

END OF SECTION

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SECTION 31 03 10

CLEAR WATER DIVERIONS

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 31 03 10-1, Aquatic Biologist Qualifications
   1. Submit resume of contractor retained aquatic biologist for implementing fish rescue and relocation.

C. RSN 31 03 10-2, Clear Water Diversion Plan:
   1. Submit designs for temporary diversion and protective works prepared, signed, and sealed by a professional engineer registered in State of California.
   2. Describe methods and facilities to be used for diversion and care of water flows and protection of work areas.
   3. Provide design flow and water surface levels for each temporary diversion works.
   4. Describe measures to be taken for rescue and relocation of fish and other aquatic organisms within the dewatered channel. Include proposed relocation sites.
   5. Include measures to be taken to meet Clean Water Act permit requirements and water quality standards required in Section 01 57 30 - Water Pollution and Erosion Control.
   6. Include descriptions of facilities, equipment, and procedures to be used for monitoring, measuring, and reporting stream flows.
   7. Include emergency action plans for all temporary water retention structures.
   8. Water control plans may be placed in operation upon approval, but nothing in this section shall relieve the Contractor from full responsibility for the adequacy of the diversion and protective works.

1.3 PROJECT CONDITIONS

A. Streamflow records included in Section 51 00 10 - Streamflow Records and Climatic Conditions and Table 31 03 10A of this Section are based on historical records and are provided solely for the information of bidders and of the Contractor in timing the Contractor's construction operations to bypass such flow as may be necessary. Actual

flows will be dependent upon the natural stream flows and project diversion requirements. CO assumes no responsibility for any deductions, interpretations, or conclusions which may be made from this information.

B. A schematic of the existing Battle Creek watershed is provided as Attachment 1 in Section 51 00 10 – Streamflow Records and Climatic Conditions.

C. In stream work is only permitted between <UPDATE ONCE KNOWN>. Diversion works must be removed from the stream by <UPDATE ONCE KNOWN> in accordance with Section 01 57 66 - Environmental Protection of Species and Habitats.

D. Do not interrupt or interfere with natural stream flows and dam releases for any purpose or reason without written approval from the COR.

E. PG&E will continue to operate and maintain all existing streamflow diversion and conveyance features throughout the duration of the Contract.

F. Dam releases are generally made by PG&E as listed in Table 31 03 10A – Dam Releases for Power Generation to provide water for power generation at South, Inskip, and Coleman Powerhouses. These flows represent maximum conditions in existing water conveyance features when sufficient water is available from drainage sources.

Table 31 03 10A - Dam Releases for Power Generation
TABLE SHOULD BE UPDATED PER CURRENT OPERATIONS

South Powerhouse Water Supply via Union Canal		
Dam to Canal	Drainage Source	Existing Maximum Flow (ft^3/s)
Volta 2 Powerhouse to Cross-Country Canal	Upper North Fork Battle Creek	123
North Battle Creek Feeder Dam to Cross-Country Canal	Upper North Fork Battle Creek	55
Digger Creek Feeder Dam to Cross-Country Canal	Digger Creek, tributary to South Fork Battle Creek	18

Table 31 03 10B – Dam Releases for Power Generation
TABLE SHOULD BE UPDATED PER CURRENT OPERATIONS

Inskip Powerhouse Water Supply via Eagle Canyon and Inskip Canals		
Dam to Canal	Drainage Source	Existing Maximum Flow (ft^3/s)
Eagle Canyon Diversion Dam to Eagle Canyon Canal	Upper North Fork Battle Creek	70

G. Minimum streamflow required at the various work sites for environmental reasons are provided in Table 31 03 10B - Minimum Streamflow Requirements.

1. Maintain minimum streamflow below structures listed in Table 31 03 10B - Minimum Streamflow Requirements at all times.

2. Actual flow in streams is anticipated to be greater than minimum flow requirements due to natural flow accretions along streams. Refer to Section 51 00 10 - Streamflow Records and Climatic Conditions.

Table 31 03 10C - Minimum Instream Flows Releases by Month for the NF Feeder Dam and Eagle Canyon Dam based on the 1999 Memorandum of Understanding

	Minimum Instream Bypass Flow (cfs)											
Diversion Dam	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NF Battle Feeder Dam	88	88	67	47	47	47	47	47	47	47	47	88
Eagle Canyon	46	46	46	46	35	35	35	35	35	35	35	46

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 DIVERSION AND CARE

A. Construct and maintain temporary diversion and protective works necessary for diversion and care of stream flows and dam releases during construction. Provide cofferdams, channels, flumes, drains, sumps, pumps, pipelines, and other works necessary to divert water flow around work. Diverted water shall not erode or otherwise compromise the integrity of structures or slope stability. Diverted water shall not introduce sediment turbidity into North Fork Battle Creek.

B. Fish may be present in the water enclosed by cofferdams. Accordingly, the dewatering pump intakes shall be screened to prevent entrainment of fish. Screens shall meet the National Marine Fisheries Service screening criteria, which include the following:

1. Perforated plate: Screen openings shall not exceed 3/32 inch, measured in diameter.
2. Profile bar: Screen openings shall not exceed 0.0689 inch in width.
3. Woven wire: Screen openings shall not exceed 3/32 inch, measured diagonally (e.g., 6 – 14 mesh).
4. Screen material shall provide a minimum of 27 percent open area.

C. The CO will arrange for rescuing fish that become isolated from the streamflow as a result of Contractor's operations.

1. Do not perform any work that could result in stranding or otherwise harming fish.
2. Notify the COR 7 days before an anticipated activity that could result in isolating fish, such as a diversion dam closure or installation of a cofferdam, to allow the COR time to inspect the operation and determine the need for a fish rescue operation.
3. When a rescue operation is needed, provide the COR 48-hour notice of the need of dewatering activities that require fish rescue to allow the COR time to mobilize.
4. Provide unrestricted access to the project site for the COR to implement the fish rescue for a period of 48 hours, or until stranded fish have been successfully removed from the stream channel, whichever period of time is greater.
5. Temporarily cease dewatering activities if fish rescue workers determine that water levels may drop too quickly to allow successful rescue of fish.
6. The Contractor is not required to participate in the rescue operation except to ensure that the work site remains accessible and in a condition safe for fish-rescue

workers.

3.2 FLOW MONITORING

A. The Contractor must monitor flows at all times. The Contractor must monitor weather patterns to determine if flow changes may occur. The Contractor must coordinate with PG&E and understand their operations and its potential impact on the project's diversion structures.

B. <Update if Necessary> PG&E contact is _____, PG&E hydrographer, Pacific Gas and Electric Company, P.O. Box 409, 31295 Manton Road, Manton, CA 96059.

C. Report any anticipated or monitored changes to flow to the COR.

3.3 REMOVAL

A. Remove temporary diversion and protective works from jobsite when no longer required.

1. Remove in a manner approved by COR.
2. Materials furnished by Contractor and placed for temporary diversion and protection works will remain property of Contractor.

3.4 REPAIR

A. Repair damage to work caused by floods, water, or failure of diversion or protective works. Obtain approval of repair or replacement work from COR.

END OF SECTION

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SECTION 31 03 33

DEWATERING

<UPDATE PER PERMIT CONDITIONS, ONCE KNOWN>

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.1 DEFINITIONS

A. Dewatering: Removal and control of “nuisance” water within the area isolated by clear water diversion structures (see Section 31 03 10) to allow construction activities to proceed as intended, in dry conditions. Dewatering also includes relief of groundwater pressure to minimize nuisance water.

1.2 SYSTEM DESCRIPTION

A. Design, install, operate, maintain, and monitor nuisance water removal facilities.

B. Design and layout facilities to collect nuisance water from water removal systems and convey nuisance water to designated approved discharge points.

C. Locate nuisance water removal facilities to maximize water removal and minimize construction interference.

D. Select pump types and design discharge systems and settling ponds.

E. Provide required equipment and monitor as required by permit.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 31 03 33-1, Dewatering Plan:

   1. Show and describe proposed method for removal of nuisance water from project sites.
   2. The plan may be placed in operation upon approval, but nothing in this paragraph shall relieve the Contractor from full responsibility for the adequacy of the water removal installation.

1.4 REGULATORY REQUIREMENTS

A. UPDATE ONCE PERMITS ARE IN PLACE

1.5 PROJECT CONDITIONS

A. Conditions which may influence the nuisance water include:

1. Frequency and rate of precipitation at the site.
2. Subsurface conditions including natural layering, thickness, permeability, and storativity of materials, and groundwater levels.
3. Efficiency of pumps, collectors, and discharge systems.

B. Water content and water levels in subsurface materials vary with location, depth, and material. The project sites are located adjacent to very active springs and therefore, the Contractor shall anticipate substantial nuisance water.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 REMOVAL OF WATER

A. Provide, maintain, and operate necessary facilities for removal of nuisance water to keep the work area free from nuisance water as required for constructing each part.

B. Where excavation extends below ground-water level, dewater the portion below the water level in advance of excavation.

3.2 DEWATERING

A. Accomplish dewatering by use of sufficient number of properly screened pumps or other equivalent methods.

END OF SECTION

SECTION 31 05 16

CHANNEL CONSTRUCTION

PART 1 GENERAL

1.1. SUMMARY

A. Upper Barrier Site (UBS)

1. The goal of the work at the UBS is to improve fish passage.
2. The objectives of are:
    - To remove existing boulders that do not help meet the goal.
    - To reconstruct the channel using existing material to create multiple drops over boulders and bedrock into pools with adequate depth below each drop.
    - To construct each hydraulic structure per the provided design elevations within the allowed tolerances.
    - To construct each hydraulic structure so that each boulder placed rests against adjacent boulders or bedrock to counteract gravitational and hydraulic forces to remain stable once water is flowing again.
3. Working with the Fish Passage Engineer, the Contractor will first remove existing boulders so that the channel can be reconstructed. Then the Contractor will begin to reconstruct the channel to the finish grades.

B. Lower Barrier Site (LBS)

1. The goal of the work at the LBS is to improve fish passage.
2. The objectives of are:
    - To remove existing boulders that do not help meet the goal.
    - To expand the width, depth, and length of Pool 4.
    - To construct two chutes into the existing channel upstream of Pool 4

C. The bulk of the Work primarily consists of boulder removal from Eagle Canyon. Once the boulders have been removed, the Contractor will construct two chutes into the existing channel. Contractor is to work closely with the Fish Passage Engineer for all Work.

D. For both sites, the finished channel will differ from those shown on the Contract Drawings. The Contract Drawings were developed using the best information available but much of the subsurface conditions are unknown. Therefore, during construction,

changes in the field will likely be necessary. The Contractor will work very closely with the Fish Passage Engineer to achieve the design goals and objectives.

1.2. MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.3. REFERENCES

A. ASTM International:
   1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
   4. Caltrans Standard Specifications Section 72

1.4. DEFINITIONS

A. Hydraulic Structure: an in-channel set of boulders, bedrock, or combination thereof that together form a structure that spans the entire width of the channel. Each structure controls the water surface elevation upstream of the structure. The flowline elevations along each structure are critical to the overall functionality of the channel.

B. Flowline Elevation: The elevation where two adjacent boulders or boulder and bedrock touch or the upstream edge of a bedrock shelf within hydraulic structures.

C. Thalweg: The point at lowest elevation along any section of the channel.

D. Sieve: An opening where water flows between, and often under, boulders that are otherwise touching (can be a series of boulders and/or bedrock).

E. Piping: Where water flows into voids between rocks and is no longer visible.

F. Boulder Fragment: The rock produced after reducing an existing boulder into smaller pieces.

G. Hydraulic Grade Line: The profile that defines the overall slope of the new channel and defines the finish grade elevation of the lowest elevation for any hydraulic structure.

H. Channel Grade Line: The finish grade profile for the new channel bed between new hydraulic structures. For the UBS, the channel grade line is one (1) foot lower than the hydraulic grade line.

I. Pool: A depression in the channel bed that is below the channel grade line.

1.5. QUALITY ASSURANCE

Contractor and Fish Passage Engineer, along with the CO and COR, will work closely together. At a minimum, the Fish Passage Engineer and Contractor shall meet at the beginning of each day and at the end of each day to discuss the Project's status and direction.

PART 2 PRODUCTS

2.1 ROCK

A. All rock for channel work is anticipated to be generated on site.

B. All boulders to be reused in the reconstruction of the UBS channel shall be free of visible fractures.

PART 3 EXECUTION

3.1 GENERAL

Refer to the notes within the Contract Drawings.

3.2 BOTH BARRIER SITES

The Contractor shall not modify or move any boulder or bedrock without the approval of the Fish Passage Engineer.

3.3 UPPER BARRIER SITE

A. The work at the Upper Barrier Site will be separated into two main phases. The first phase is to prepare the channel for reconstruction. This work includes the removal of existing boulders and bedrock that are currently above the channel grade line. These boulders shall be stockpiled on-site for potential reuse in the second phase. The second phase is the rebuilding of the channel and removing additional rock to form pools below hydraulic structures as presented in the Drawings and as directed. The materials for rebuilding the channel will be individually selected from the boulders removed in the first phase. Existing boulders not removed during the first phase may need to be modified to meet the design intent.

B. In addition to boulders, the Contractor shall stockpile gravels and other smaller

rocks removed during the first phase of work to be used during the second phase.

C. Separate stockpiled rock material by size to the extent practical.

D. The surface of the finished channel bed shall be rough with boulders protruding above the channel grade line.

E. Avoid disturbing a hydraulic structure once it has been installed.

F. Each hydraulic structure must be backfilled with native materials to fill voids and hydraulically seal the structure so that water pools upstream of the structure. The Fish Passage Engineer will require the Contractor to show that the structure is sealed by adding water.

3.4 LOWER BARRIER SITE

A. The primary Work to be completed at the LBS includes removing large boulders from the site to expand Pool 4. In addition to this work, two chutes will be constructed into the existing channel upstream of Pool 4.

B. The Contractor may reduce existing boulders to a size most convenient to complete the work but all boulder fragments must be removed unless otherwise directed.

END OF SECTION

SECTION 31 11 00
CLEARING AND GRUBBING

PART 1 GENERAL

1.1 SUMMARY

A. This specification section covers the following items of work:

1. Clearing, grubbing, and stripping the designated areas of work and disposal of debris.

2. Protection of improvements on owner property and the preservation from injury or defacement of trees, shrubs, vegetation and existing features designated to remain.

B Vegetation clearing, with exception of minor trimming, work is only permitted between <UPDATE ONCE KNOWN> and in in accordance with Section 01 57 66 - Environmental Protection of Species and Habitats, and Permits.

1.2 MEASUREMENT AND PAYMENT

A. Cost:
1. Refer to Section 01 20 00 Measurement and Payment.

1.3 DEFINITIONS

A. Whenever in this section the following terms are used, the intent and meaning shall be interpreted as stated below:

1. Clearing:

a. Clearing shall consist of cutting, removing, and disposing of all objectionable material from the ground surface, such as trash, trees, brush, logs, stumps, weeds, grasses, and obstructions of any kind, natural or artificial. Trees, shrubs, and vegetation designated to remain shall not be removed or disturbed. Trees and shrubs adjacent to work areas shall be protected from damage.

b. Work shall be performed in such a manner as to remove all evidence of the objects' presence from the surface. Clearing shall also include the removal and disposal of trash piles and rubbish from the work Site created prior to and during the duration of the Work.

2. Grubbing: Grubbing shall consist of cutting, removing, and disposing of all

objectionable material found below the ground surface, such as trash, trees, brush, logs, stumps, weeds, grasses, and obstructions of any kind, natural or artificial. Trees and stumps requiring removal shall be removed completely from the ground.

1.4 SUBMITTAL

A. The Contractor must provide a detailed description of planned clearing, and grubbing activities in the Site Use and Staging Plan, see Section 01 14 10.

1.5 PRESERVATION OF PROPERTY

A. Where construction is to be performed in the vicinity of trees and shrubbery, the work shall be carried on in a manner which will cause minimum damage. Trees which are to be removed will be designated on the drawings. Under no circumstances are additional trees to be removed without written permission from the COR. Trees and shrubbery that are not to be removed shall be protected from injury or damage resulting from the Contractor's operations. It shall be the responsibility of the Contractor to alert his men, his suppliers, and all sub-contractors of the intent of these Specifications pertaining to the protection of vegetation. During the execution of his work, the Contractor shall use the same care and protection of all vegetation within their work area.

B. In areas where trees or shrubs may be damaged by construction equipment, the Contractor shall provide protective fencing, padding on tree trunks, tie-back branches or take other necessary actions to prevent damage to the trees, shrubs, or other vegetation. Damage to trees and shrubs shall include, but will not be limited to:

1. Bark damage to trees
2. Breakage of branches on trees or shrubs
3. Breaking or tearing of roots
4. Spilling toxic materials near the root zones
5. Spraying toxic materials on foliage
6. Fire damage to foliage and branches
7. Compaction of root areas under the drip line or damage by fill or storage of materials over the root zone
8. Foot or vehicular damage on low shrubs and groundcover

C. All damage shall be immediately reported to the COR who will file a report so that penalties may be determined.

D. If the Contractor inadvertently removes vegetation not designated for removal, the Contractor shall replant at a ratio of 3-to-1 (replanted area-to-removed area) of species, size and location directed by the COR. The penalty is also applicable to trees damaged to the extent that such damage will, in the COR's opinion, cause the tree to die.

E. Contractor shall exercise caution when working near trees not designated to be removed, so that the trees will not be damaged. No root greater than 1 inch in diameter shall be cut unless it is necessary to do so during excavation to reach the specified grade.

1.6 PROJECT CONDITIONS

A. Environmental requirements:

1. No burning shall be permitted.

2. Contractor shall be responsible for obtaining all necessary permits, approvals and COR's authorization for disposal of material resulting from grubbing and stripping operations in areas not already specified in the contract documents.

PART 2 PRODUCTS

2.1 WOOD CHIPS

A. Wood Chip Material is the result of chipping grubbed material. The Wood Chip Material must meet the following specifications:

1. Maximum acceptable soil content is 5% by weight.

2. 8 inch minus wood chip material

PART 3 EXECUTION

3.1 GENERAL

A. Clearing and grubbing shall be minimized.

B. Clearing and grubbing operations shall be conducted with minimum interference with roads and adjacent facilities. Roads and facilities shall not be obstructed without approval from the COR.

C. Refer to the Contract Drawings for the limits of vegetation clearing.

D. The Contractor shall stake out all work areas designated for clearing and grubbing prior to any clearing or grubbing activities occurring. The Contractor shall be responsible for the accuracy, maintenance and observation of all lines and

elevations. No clearing or grubbing activities may begin until the COR has approved the staked limits and approved the Site Use Plan (see Section 01 14 10).

E. Temporary work areas, which are affected by the Contractor's work, shall be restored to a condition as good as existed before the work began.

3.2 DISPOSAL OF CLEARING AND GRUBBING DEBRIS

A. Wood chips are to be spread on site as directed by the COR.

B. See Section 31 23 90 Disposal of Excavated Materials.

END OF SECTION

SECTION 31 15 00

CANYON STABILIZATION FOR CONSTRUCTION SAFETY

PART 1 GENERAL

1.1 DESCRIPTION

A Canyon wall stabilization is not required for the long term performance of the fish passage improvements shown on the project plans and drawings. However, canyon wall stabilization may be needed, for temporary worker safety during all aspects of construction, as deemed necessary by the Contractor.

B Cotton, Shires and Associates (CSA) completed the August 2016, *Engineering Geologic Investigation, Technical Memorandum, Eagle Canyon Fish Passage Improvement in Battle Creek, Manton, California*. This document will be made available to the Contractor upon request.

C The Contractor shall retain the services of an Engineering Geologist and a Civil Engineer licensed in the state of California with five years of rockslope stabilization experience to observe the field conditions, perform all investigations and testing they deem necessary, evaluate site safety with regards to rockfall and other slope hazards during construction, prepare submittals. The Contractor's Engineering Geologist and/or Engineer shall be on-site during the canyon wall stabilization operations.

D Both the project sites are potentially impacted by detached rock blocks on the steep canyon walls.

E Canyon wall stabilization work can include, but is not necessarily limited to: removal of vegetation, soil and refuse from the rock, rock scaling (the removal of loose and/or potentially unstable rocks in the general construction and site access areas), installation of rock bolts, installation of rock dowels, shotcrete, earth or concrete buttresses, dewatering, and installation of mesh drapery or netting.

1.2 REFERENCES

A Codes and Regulations of the Counties of Shasta and Tehama.

1.3 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.4 SUBMITTALS

A Refer to Section 01 33 00 – Submittals for submittal requirements and procedures.

B RSN 31 15 00-1, Engineering Geologist and Civil Engineer Qualifications

1 Qualifications of Engineering Geologist and Civil Engineer that will evaluate the canyon walls and developing the Stabilization Plan.

C RSN 31 15 00-2, Stabilization Plan.

1 The Stabilization Plan must clearly identify specific areas that will require canyon wall stabilization and appropriate methods (scaling, bolting, etc.) to ensure a safe site for the anticipated construction methods.

2 The Stabilization Plan must include a geotechnical design summary, a detailed description of the work to be completed and procedural methods, detailed description of safety procedures, wall stabilization design drawings showing locations and details of slope improvement techniques as needed for temporary construction safety.

1.5 QUALITY ASSURANCE

A Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with specified requirements and the methods needed for proper performance of the work in this section.

B COR will be present during the slope improvement works to observe operations.

1.6 JOB CONDITIONS

A Protect existing utilities: Coordinate with all affected agencies, including PG&E, regarding the Eagle Canyon Flume.

B Protect Persons and Property

1 Barricade open depressions and holes occurring as part of this work, and post warning lights on property adjacent to or with public access.

2 Protect the work site from damage caused by falling rock debris, settlement, lateral movement, undermining, washout, and other hazards created by operations under this section.

PART 2 PRODUCTS

2.1 MATERIALS

A Provide materials, not specifically described but required for a complete and proper execution of the work of this section, as selected by the Contractor subject to the approval

of the COR.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

A Examine the canyon faces surrounding the work area and identify conditions that need to be addressed for worker safety. Correct conditions that are deemed unsafe or are detrimental to timely and proper completion of the work. Do not proceed until unsafe/unsatisfactory conditions are corrected.

3.2 SAFETY REQUIREMENTS

A All work shall be done in conformance with the rules and regulations pertaining to safety established by the California Division of Industrial Safety and as specified under Section 01 35 20 – Health and Safety.

3.3 SUSPENDED ACCESS MEASURES

If the Contractor deems that suspended access will be required for slope improvement for temporary construction safety:

1 The Contractor shall be responsible for locating suitable suspended access anchor locations. The CO accepts no responsibility for the assessment of the suitability of an anchor point.

2 If required, anchors shall be designed, placed and removed by the Contractor at the Contractor's expense.

3 Placement and removal of anchors and operation of safety lines shall not cause significant damage to existing facilities or vegetation not designated for removal.

4 Safety lines shall not be left unattended while not in use.

B Workers performing rock scaling with suspended access shall be provided with all the necessary fall arrest equipment, shall be properly trained in fall arrest measures and shall be equipped with two way radios.

3.4 VEGETATION AND SOIL REMOVAL

A Clearing shall be in accordance with Section 31 11 00 – Clearing and Grubbing.

3.5 ROCK SCALING

A The Contractor's Engineering Geologist and Civil Engineer shall determine where rock scaling is required and where anchoring is necessary. Supplemental scaling and or anchoring may be required after the initial scaling is completed, to address unforeseen situations.

B The scaling crew shall consist of at least 2 persons in two-way radio contact with each other and the Contractor at all times.

C Manual scaling shall be undertaken from the top of the canyon wall downwards to ensure that at no time the scaling crew is working beneath loosened or undercut areas of the rock face.

D Remove loose rock with hand tools or light power tools only.

E The rock face shall be inspected by the scaling crew at the start and end of each shift to identify rock that requires immediate removal so as not to endanger the workers.

F Inspect the rock face to ensure that loose rock that may endanger the work areas below has been removed prior to the shutdown at end of each day.

G The Contractor shall be responsible for ensuring that safe temporary protection is in place to prevent uncontrolled falling of rock.

3.6 DISPOSAL OF WASTE MATERIAL

A Disposal shall be in accordance with Section 31 23 90 of the Specifications.

END OF SECTION 31 15 00

SECTION 31 23 90
DISPOSAL OF MATERIALS

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:
   1. Refer to Section 01 20 00 Measurement and Payment.

1.2 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 – Submittals.

B. RSN 31 23 90-1, Disposal Site Details

   1. Provide disposal site details including location and other contact information for all disposal sites. Indicate what material is going to what location and facility.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 DISPOSAL OF EXCAVATED MATERIALS

A. Waste material from required excavation which is not suitable or required for backfill or channel reconstruction, embankment, or topsoil shall be disposed.

   1. Dispose of excess excavation at offsite location, unless permitted otherwise by the COR.

   2. Temporarily stockpile material so it will not impede or alter natural flow of streams or cross drainage.

   3. Temporarily stockpile material in an orderly fashion.

B. Vegetation material not spread on site, shall be disposed offsite at

END OF SECTION

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SECTION 32 92 20
REVEGETATION

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Cost:

1. Include in prices offered in Price Schedule for other items of work.

1.2 DEFINITIONS

A. Pure Live Seed Content: Weight of seed times percent purity times percent germination.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 32 92 20-1, Resume:

1. Qualifying experience for rehabilitation specialist responsible for supervision of seeding.
2. Names, addresses, and telephone numbers of references.

C. RSN 32 92 20-2, Seeding Plan:

1. Names, addresses, and telephone numbers of references.
2. Equipment.
3. Name and address of seed suppliers.

D. RSN 32 92 20-3, Certifications:

1. Origin of seed.
2. Percent purity and germination.
3. Prohibited and restricted weed seed content.

E. RSN 32 92 20-4, Mycorrhizal Inoculum Information and Certifications:

1. Expected shelf life and current age.
2. Certificate of number of propagules per volume of bulk material.
3. Certification of species of mycorrhizal fungus contained.

F. RSN 32 92 20-5, Fertilizer, Hydromulch and Stabilizers, Mulch Netting, and Anchors:

1. Submit manufacturer’s information on:

a. Hydromulch.

b. Stabilizer products.

c. Mulch netting.

d. Anchors.

2. Provide material samples, if requested by COR.

1.4 QUALIFICATIONS

A. Rehabilitation Specialist:

1. Previous experience with mix designs, site preparation, seed application, and mycorrhizal fungi application.

2. Specialist shall be onsite to provide oversight of Contractor's operation during landscape rehabilitation operations.

1.5 QUALITY ASSURANCE

A. Success Criteria/Monitoring:

1. As part of the CEQA Mitigation and Monitoring and Reporting Plan, the Contractor shall prepare an Erosion and Sediment Control Plan (refer to Section 01 57 30 - Water Pollution and Erosion Control; the Erosion and Sediment Control Plan shall be a component of, or otherwise incorporated into the SWPPP).

2. Erosion and Sediment Control Plan shall include success criteria for seeded areas based on vegetative coverage both by native and nonnative vegetation, and erosion prevention.

1.6 DELIVERY STORAGE AND HANDLING

A. Seed Containers:

1. New and delivered in sealed containers (bags, boxes), as applicable.

2. Labeled:

a. Clearly labeled with the manufacture's labels and certification tags, as applicable.

b. Identify seed origin on label.

1) Intrastate shipping: In accordance with California Seed Laws and Regulations.

2) Interstate shipping: In accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act.

3. Mycorrhizal Inoculum:

a. Do not expose to temperatures above 90 degrees Fahrenheit or below 32 degrees Fahrenheit.

b. Store out of direct sunlight.

1.7 ENVIRONMENTAL CONDITIONS

A. Unless otherwise approved by the COR, reseeding shall be completed by <UPDATE WHEN KNOWN> to allow disturbed areas to stabilize before seasonal rains arrive.

1. Stabilize disturbed areas before seasonal rains.
2. If seeding is not completed before seasonal rains, temporary erosion and sediment control structural (non-vegetative) measures shall be installed.

B. Temperature Restrictions:

1. Do not seed when soil surface temperature is above 90 degrees.
2. Do not seed or fertilize when ambient temperature is below 38 degrees without approval of the COR.

C. Snow and Wind Restrictions:

1. Do not seed or fertilize when ground is covered by snow.
2. Do not seed, fertilize, mulch, or hydroseed when wind velocities prevent uniform application of materials or cause materials to drift.

PART 2 PRODUCTS

2.1 CONDITION OF MATERIALS

A. New and delivered in sealed containers (bags, boxes), as applicable.

B. Clearly labeled with the manufactures' labels and certification tags, as applicable.

2.2 SEED

A. Weed seeds classified by California Department of Food and Agriculture:

1. Prohibited Noxious Weeds: None.
2. Restricted Noxious Weeds: 0.5 percent maximum, by weight.

B. Seed Containers:

1. Sealed and labeled in separate containers to comply with California State Seed Laws and Regulations or in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act, if shipped in Interstate Commerce.

C. Identify seed origin on label.

D. Seed Mixture:

1. Purity, Minimum: 85 percent.
2. Germination, Minimum: 85 percent.
   a. Germination test: Less than 1 year old at time of seeding.
3. Uniform mixture shown in Table 32 92 20A - Seed Mixture.
4. Mix Seed with Red Flaky Wheat Bran: 50:50 mixture.

Table 32 92 20A. - Seed Mixture

Common Name	Botanical Name	Application Rate (Pounds pure live seed per acre)
California Brome	*Bromus carinatus*	3
Blue wild rye	*Elymus glaucus*	3
California Onion Grass	*Melica californica*	3
Nodding needlegrass	*Nassella cernua*	3
Purple needlegrass	*Nassella pulchra*	8
One sided bluegrass	*Poa secunda secunda*	4
California poppy	*Eschscholzia californica*	2
Arroyo lupine	*Lupinus succulentus*	4
Sky lupine	*Lupinus nanus*	2
Regreen (wheat x wheatgrass hybrid)	*Triticum x Elymus*	40
	Total	72

2.3 MYCORRHIZAL INOCULUM

A. Spores, mycelium, and mycorrhizal root fragments in a solid carrier.

B. Suitable for handling by hydroseeding or dry seeding equipment.

C. Carrier:

1. Material in which the inoculum was originally produced.

2. Organic materials, vermiculite, perlite, calcined clay, or other approved materials.

3. Suitable for mechanical application and good plant growth.

D. Viable and healthy.

E. Minimum Propagules of Suitable Mycorrhizal Fungus: 50 per cubic centimeter of bulk inoculum.

F. Fungi Species:

1. Required: One or more from the genus *Glomus.*

2. Optional: One or more from the genera *Scierocycyctis, Gigaspora, Scutellospora, Entrophospora,* or *Acaulospora.*

2.4 MULCH

A. Wood chips from vegetation removal, if approved by COR.

B. Commercially Obtained Straw:

1. Rice straw.

2. State-certified Weed-free Wheat or Barley Straw:

a. Not obtained from dry farm cereal crops.

b. The County Agricultural Commissioners and the California Department of Food and Agriculture (CDFA) defined weed-free as hay, feed, straw or straw mulch that has been inspected, and certified not to contain propagative plant parts or seeds of noxious weeds.

3. Free of mold or other evidence of decomposition.

4. Free from weeds and viable seeds.

5. Length: At least 50 percent of material at least 10 inches long.

2.5 WOOD FIBER HYDROMULCH

A. Mat-Fiber Plus, manufactured by Mat Incorporated, 12402 Highway 2, Floodwood, MN 55736, telephone: 1 -888-477-3028; Spray Mulch X-80 manufactured by Pacific Wood Fibers, P.O. Box 2109, Redmond, WA 98052; or equal, having the following essential characteristics:

1. Wood cellulose fiber, 100 percent recovered.

2. No germination or growth inhibiting factors.

3. Dyed appropriate color to allow visual metering of application.

4. Evenly dispersed and suspended when agitated in water.

5. Forms blotter like ground cover that readily absorbs water and allows infiltration to underlying soil.

2.6 STABILIZING EMULSION

A. Mixture of at least three specially blended compatible hydrocolloids.

1. One hydrocolloid will act as a slippery agent during suspension.
2. Will form loose, long-chain-like film on drying.
3. No growth or germination inhibiting factors.
4. Hydrates and disperses in circulating water to form homogeneous slurry.
5. Equilibrium air dry moisture content at time of manufacture of 8 percent, plus or minus 2 percent.
6. Minimum Water Holding Capacity: 6-1/2 times weight of dry material.

2.7 MULCH NETTING AND ANCHORS

A. Erosion Control Netting: 100 percent biodegradable.

B. Anchors: Pins or staples recommended by netting manufacturer.

2.8 EXECUTION

PART 3 EXECUTION

3.1 SEEDBED PREPARATION

A. Complete prior to seeding and mulching, or hydromulching.

B. Remove nuisance weeds, vegetation and erosion control materials.

C. Scarify or harrow and rake topsoil to minimum depth of 3 inches.

D. Remove stiff clods, lumps, roots, litter, stones, and other foreign material greater than 6 inches in size from the surface. Dispose of removed materials in accordance with Section 01 74 00 - Cleaning and Waste Management.

E. Fill or smooth topsoil surface to remove rills, gullies and depressions.

F. Protect prepared topsoil surfaces from erosion and washouts. Repair damaged surfaces as required.

G. Hydroseeded Areas: Track walk up and down slope prior to seeding, so far as practicable.

3.2 SEEDING

A. Seed following areas:

1. Areas disturbed for permanent construction.

2. Stockpile areas.
3. Disposal areas for excavated materials.
4. Contractor use areas.

B. Seed applied by drilling or imprinting. In areas that are inaccessible or too steep for these methods, hydroseeding or broadcast seeding may be used with the approval of the COR.

C. Apply seed mixture at rate specified in Table 32 92 20A - Seed Mixture.
1. Measure and mix individual seed species on site in presence of COR.
2. Mix Seed with Red Flaky Wheat Bran: 50:50 mixture.

D. Apply mycorrhizal inoculum at 9 pounds per acre.
1. Prevent equipment used to apply mycorrhizal inoculum from warming the material above 90 degrees Fahrenheit.

E. Do not seed, fertilize, mulch, or hydroseed when wind velocities prevent uniform application of materials or would drift materials.

F. Fertilizer may be applied in a separate operation after seeding where plant growth or lack of plant growth indicates deficiencies in growth medium as approved by COR.
1. Topsoil conditions at various worksites are expected to vary.
2. Test soil at each site to determine nutrient level in soil. Number of soil tests to be determined by Rehabilitation Specialist. A minimum of two soil samples at each site shall be required.
3. Application rate of fertilizer to be determined by Rehabilitation Specialist based on existing nutrient levels in soil. Application rate may vary at different sites.

3.3 DRILLING SEED

A. Drill:
1. Range land drill seeder.
2. Fluffy seed box equipped with:
   a. Agitators.
   b. Metal row dividers.
   c. Individual box adjustment to meter seed flow.
3. Maximum Distance Between Rows: 8 inches.

B. Regulate drill to uniformly distribute seed at rate specified and cover with soil depth of 1/4- to 1/2-inch.

C. Mycorrhizal Inoculum Application:

1. Mix with and apply with seed, or
2. Broadcast prior to drilling.
    a. Mulch prior to drilling seed.
    b. Secure mulch by mechanical methods.

D. Drill crosswise to general slope where possible to safely operate equipment.

3.4 BROADCAST SEEDING

A. Broadcast seed only in areas not accessible for drilling or hydroseeding.

B. Apply mycorrhizal inoculum before applying seed.

C. Apply seed and fertilizer separately.

D. Mechanical Broadcasting:
1. Equipment:
    a. Centrifugal type.
    b. Pull type similar to fertilizer spreader.
2. Designed and regulated to apply mycorrhizal inoculum or seed uniformly at proper rate per acre.
3. Does not grind or compress mycorrhizal inoculum carrier granules or fungal spores.

E. Hand Broadcasting:
1. By hand broadcaster.
2. By hand.
3. Uniformly applied.

F. Cover seed with soil to depth of 1/4- to 1/2-inch immediately after broadcasting.
1. Use hand rake or float.
2. Do not use log chain or similar device.

3.5 MULCHING

A. Mulch seeded areas except steep areas without topsoil.

B. Spread within 24 hours of spreading seed. If ambient temperatures will exceed 90 degrees, apply within 3 hours of applying mycorrhizal inoculum.
1. Spread uniformly by hand or with mechanical mulch spreader.
2. Do not apply when wind velocity exceeds 15 miles per hour.

C. Rates:

1. Rice Mulch: 3,000 pounds air-dry mulch per acre.
2. Wheat or Barley Mulch: 4,000 pounds air-dry mulch per acre.
3. Air-dry: Maximum 15 percent moisture content. Adjust application rates for mulch with higher moisture content.

D. Immediately Anchor Mulch with one of the following methods:

1. Mulch Netting:
   a. Manufactured mulch netting.
   b. Follow manufacturer's instructions.
   c. Pulling netting hand-tight over straw.
   d. Anchor netting firmly in place.
2. Mechanical Threader:
   a. Equipment:
      1) Heavy disk implement such as straw crimper.
      2) Flat serrated disks with dull edges.
      3) Disk diameter: Sufficient to prevent disk frame from dragging mulch material.
      4) Maximum disk spacing: 9 inches.
   b. Anchoring depth: 2 to 3 inches.
   c. Maximum passes: 2.
   d. Operate crosswise to slope.
3. Stabilizing Emulsion:
   a. Use for land imprinter seeding.
   b. For other seeding methods, use only on surfaces steeper than 3H:1V unless otherwise approved by COR.
   c. Apply with hydroseeding equipment.
   d. Slurry:
      1) Stabilizing emulsion: 140 pounds dry solids per acre.
      2) Fiber: 350 pounds per acre.
      3) Water: Ratio of total water to total stabilizing emulsion as recommended by manufacturer.

3.6 STEEP AREAS WITHOUT TOPSOIL

A. Seed surfaces where it is impractical to place topsoil, slopes steeper than 2H:1V, using the following procedure.

B. Apply seed slurry, then mulch slurry using hydro-seeding equipment. Mulch slurry to be applied in accordance with article 3.07 Hydromulching.

C. Hydro-Seeding Equipment:

1. Continuously stir and mix slurry to maintain uniform mixture.
2. Prevent settling of solids in corners and bottom of tank.
3. Paddle-type agitator.
4. Recirculation pump.

D. Seed Slurry:

1. Mix to keep homogeneous.
2. Ingredients:
    a. Water.
    b. Seed.
    c. Mycorrhizal inoculum.
    d. Hydromulch:
        1) Rate: 1,000 pounds per acre at 10 percent moisture content.
        2) Add to water slurry after seed.
3. Maximum Time Between Batching Slurry and Application: 1-hour.

E. Spray apply seed slurry mix uniformly.

F. Use mulch coloring as metering agent.

G. Apply seed slurry before mulch slurry.

3.7 HYDROMULCHING

A. Apply using hydro-seeding equipment.

B. Mulch Slurry:

1. Mix to keep homogeneous.
2. Ingredients:
    a. Water.
    b. Stabilizing emulsion.

c. Hydromulch: 3,000 pounds per acre at 10 percent moisture content.

3. Maximum Time Between Batching Slurry and Application: 1-hour.

C. Spray apply mulch slurry mix uniformly.

D. Use mulch coloring as metering agent.

E. Apply mulch slurry within 24 hours after applying seed.

END OF SECTION

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SECTION 51 00 00

INFORMATION AVAILABLE TO OFFERORS

PART 1 GENERAL

1.1 ORDER OF PRECEDENCE

A. In case of differences between sections in Division 51 - Information Available to Offerors and sections in other divisions of the specifications, the requirements in the other divisions will govern.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

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SECTION 51 00 10

STREAMFLOW RECORDS AND CLIMATIC CONDITIONS

PART 1 GENERAL

1.1 STREAMFLOW RECORDS

A. Battle Creek is a tributary of the Sacramento River and is formed by the junction of North Fork and South Fork Battle Creek. There are numerous smaller tributaries which also contribute to the Battle Creek flows, including Rock Creek, Bailey Creek, Millseat Creek, Digger Creek, and Juniper Gulch on the North Fork; and Soap Creek, Ripley Creek, and Spring Creek on the South Fork. Baldwin Creek and Spring Branch enter Battle Creek below the confluence of North Fork and South Fork Battle Creek, before reaching the Sacramento River. The Work for this Contract is to be completed on North Fork Battle Creek.

B. The streamflow estimates provided in this section are for the information of offerors and the Contractor only. The CO does not represent the reliability or accuracy of this information. The Contractor shall undertake, at the Contractor's expense, such studies as are believed necessary to assess the reliability and accuracy of the information provided in this section.

C. Streamflow records for the Battle Creek watershed are available to offerors and to the Contractor for various locations and time periods as summarized in Table 51 00 10 A - Streamflow Records for Battle Creek Watershed. Attachment 1 includes a watershed schematic that shows some of the locations of these facilities.

Table 51 00 10 A – Streamflow Records for Battle Creek Watershed

Location	Time Period	Operator	Drainage Area mi^2
Battle Creek d/s of Coleman National Fish Hatchery	Nov 1961 - Oct 1996; May 1997 - present	USGS (gage station 11376550)	357
Battle Creek u/s of Coleman National Fish Hatchery	Oct 1940 - Sept 1961	USGS (gage station 11376500)	356
Wildcat Bridge, North Fork	Dec 1999 – Sept 2015	CDWR (BNF)	213
NF Battle Crk @ Wildcat Div	1984 to 2015	PG&E	188
NF Battle Crk @ Wildcat Div	June 2016 – present	PG&E	188
D/S of Wildcat Diversion Dam	Oct 1997 - present	PG&E*	189
D/S of Coleman Diversion Dam	Oct 1997 - present	PG&E*	102

*Stage records only.

D. Due to the specific nature of the hydrology in the Battle Creek watershed, the relative contributions of the two forks for infrequent high flows are different than those for sustained normal flows. Based on local observations and the limited stream gage record, the South Fork drainage basin (124 mi^2) is more susceptible to intense rainfall and runoff and therefore can experience higher peak flows. The North Fork drainage basin (213 mi^2) is larger and at a higher elevation. It receives a greater portion of its water from snow melt and therefore experiences less variability. In general, the South Fork contributes more flow than the North Fork during high flow events, but during most of the rest of the year (for annual average events) the North Fork contributes a larger portion of the flow, as shown in Table 51 00 10 B - Flow Fractions for Streamflow at Various Battle Creek Locations for various project locations.

Table 51 00 10 B – Flow Fractions for Streamflow at Various Battle Creek Locations

	USGS gage	North Fork	Wildcat Dam	Eagle Canyon Dam	N. Battle Feeder Dam	South Fork	Coleman Dam	Inskip Dam	South Dam
Drainage area (sq. mi)	357	213	189	186	133	124	102	88	67
Approximate elevation (feet)	415	830	1070	1420	2060	830	1000	1410	2030
Annual average flow fraction	1.0	0.53	0.53	0.53	0.44	0.47	0.47	0.44	0.38
High flow fraction	1.0	0.38	0.38	0.38	0.32	0.60	0.60	0.55	0.49

E. Data was collected at the North Fork Battle Creek gage for the water years 2001-2015. Table 51 00 10 C presents the median, 10^{th} percentile, and 90^{th} percentile flows at the gage for each month to assess the capacity of diversions around the proposed work area.

Table 51 00 10 C –10th percentile, Median, and 90th Percentile Flows, North Fork Battle Creek Gage in Cubic Feet Per Second (CFS)

Month	10th Percentile	Median	90th Percentile
Oct	38.0	43.0	55.0
Nov	41.0	45.0	68.1
Dec	41.0	48.0	191.0
Jan	42.0	57.0	170.0
Feb	44.0	66.0	207.4
Mar	44.0	64.0	330.2
Apr	43.0	66.0	294.4
May	41.0	62.0	325.6
Jun	40.0	51.0	246.0
Jul	38.0	41.0	100.6
Aug	37.0	41.0	53.6
Sep	38.0	42.0	50.0

F. Table 51 00 10 D presents the peak flows at the Coleman USGS gage, the North Battle Creek Feeder Dam, and Eagle Canyon Dam.

Table 51 00 10 D - Flood Flow Estimates in cubic feet per second (cfs)

Return Period (yr)	Coleman USGS gage	North Battle Creek Feeder Dam	Eagle Canyon Dam
2	6700	2100	2500
2.33	7600	2400	2900
5	11600	3700	4400
10	15100	4800	5700
25	19700	6300	7500
50	23300	7500	8900
100	26900	8600	10200

G. Table 51 00 10 E presents the minimum instream flows as agreed to, in the 1999 Memorandum of Understanding, by PG&E and other parties. Flow may be less than presented if the flow reaching the facilities is less than presented.

Table 51 00 10 E – Minimum Instream Flows Releases by Month for the NF Feeder Dam and Eagle Canyon Dam as presented in the 1999 Memorandum of Understanding

	Minimum Instream Bypass Flow (cfs)											
Diversion Dam	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NF Battle Feeder Dam	88	88	67	47	47	47	47	47	47	47	47	88
Eagle Canyon	46	46	46	46	35	35	35	35	35	35	35	46

1.2 CLIMATIC CONDITIONS

A. Monthly temperature data (maximum, minimum, and mean) in degrees Fahrenheit for the project area are provided in Table 51 00 10 E – Average Monthly Temperature Data in Degrees Fahrenheit. These data were obtained by PG&E between 1948 and 2001 at Volta Powerhouse, North Fork Battle Creek, at about elevation 2200. Additional temperature data recorded by PG&E at this site may be obtained from the Western Regional Climate Center, wrcc@dri.edu.

Table 51 00 10 E – Average Monthly Temperature Data in Degrees Fahrenheit – Volta Powerhouse (1948-2001)

Month	Average Max. Temp.	Average Min. Temp.	Average Mean Temp.
January	52.2	33.7	42.9
February	57.1	36.4	46.8
March	59.5	37.5	48.5
April	67.4	42.2	54.8
May	76.0	48.6	62.3
June	85.1	55.4	70.2
July	93.8	61.1	77.5
August	92.1	59.6	75.8
September	87.0	55.7	71.4
October	75.2	47.9	61.5
November	61.9	40.5	51.2
December	54.3	35.1	44.7
Annual Average	71.8	46.1	59.0

Table 51 00 10 F – Average Monthly Temperature Data in Degrees Fahrenheit – North Battle Creek Feeder (2003)

Month	Average Max. Temp.	Average Min. Temp.	Average Mean Temp.
January	66	32	49.0
February	46	27	36.5
March	66	40	53.0
April	68	31	49.5
May	91	34	62.5
June	95	48	71.5
July	98	54	76.0
August	92	59	75.5
September	90	46	68.0
October	80	31	55.5
November	61	29	45.0
December	56	24	40.0
January (2004)	63	29	46.0
Annual Average	74.8	37.2	56.0

Table 51 00 10 G – Average Monthly Temperature Data in Degrees Fahrenheit – Eagle Canyon Diversion (2003)

Month	Average Max. Temp.	Average Min. Temp.	Average Mean Temp.
January	65	33	49.0
February	57	34	45.5
March	63	36	49.5
April	70	34	52.0
May	87	37	62.0
June	93	52	72.5
July	99	56	77.5
August	94	52	73.0
September	93	45	69.0
October	78	35	56.5
November	58	29	43.5
December	60	29	44.5
January (2004)	57	32	44.5
Annual Average	74.9	38.8	56.8

B. Average monthly precipitation amounts in inches for two locations within the Battle Creek watershed are provided in Table 51 00 10 F - Average Monthly Precipitation Data in Inches. The Volta gage is located south of Shingletown near the Volta Powerhouse, on North Fork Battle Creek at about elevation 2200, and includes recorded monthly rainfall amounts from October 1919 through December 1999. The Battle Ridge gage is located south of Highway 36 and east of Paynes Creek at about elevation 3400, and includes recorded daily rainfall amounts from January 1989 through December 1999.

Table 51 00 10 H – Average Monthly Precipitation Data in Inches

Month	Volta Gage	Battle Ridge Gage	Average
January	7.8	6.8	7.3
February	5.0	6.3	5.6
March	5.1	5.2	5.1
April	3.4	2.9	3.2
May	3.2	3.0	3.1
June	1.5	1.3	1.4
July	0.1	0.1	0.1
August	0.3	0.2	0.3
September	1.0	1.6	1.3
October	2.4	1.9	2.2
November	2.5	2.5	2.5
December	5.4	4.6	5.0
Totals	**37.7**	**36.4**	**37.1**

C. The highest amounts of precipitation in the Battle Creek watershed generally occur in the months of December through March. Although there is very little rainfall in the summer months of July and August, a reliable base flow is maintained in the North Fork and South Fork Battle Creek due to snow melt and spring flow.

D. These temperature and precipitation data are provided for the information of offerors and the Contractor, and were recorded at locations different from the worksite. Actual climatic conditions during construction may vary from the average conditions summarized in this section.

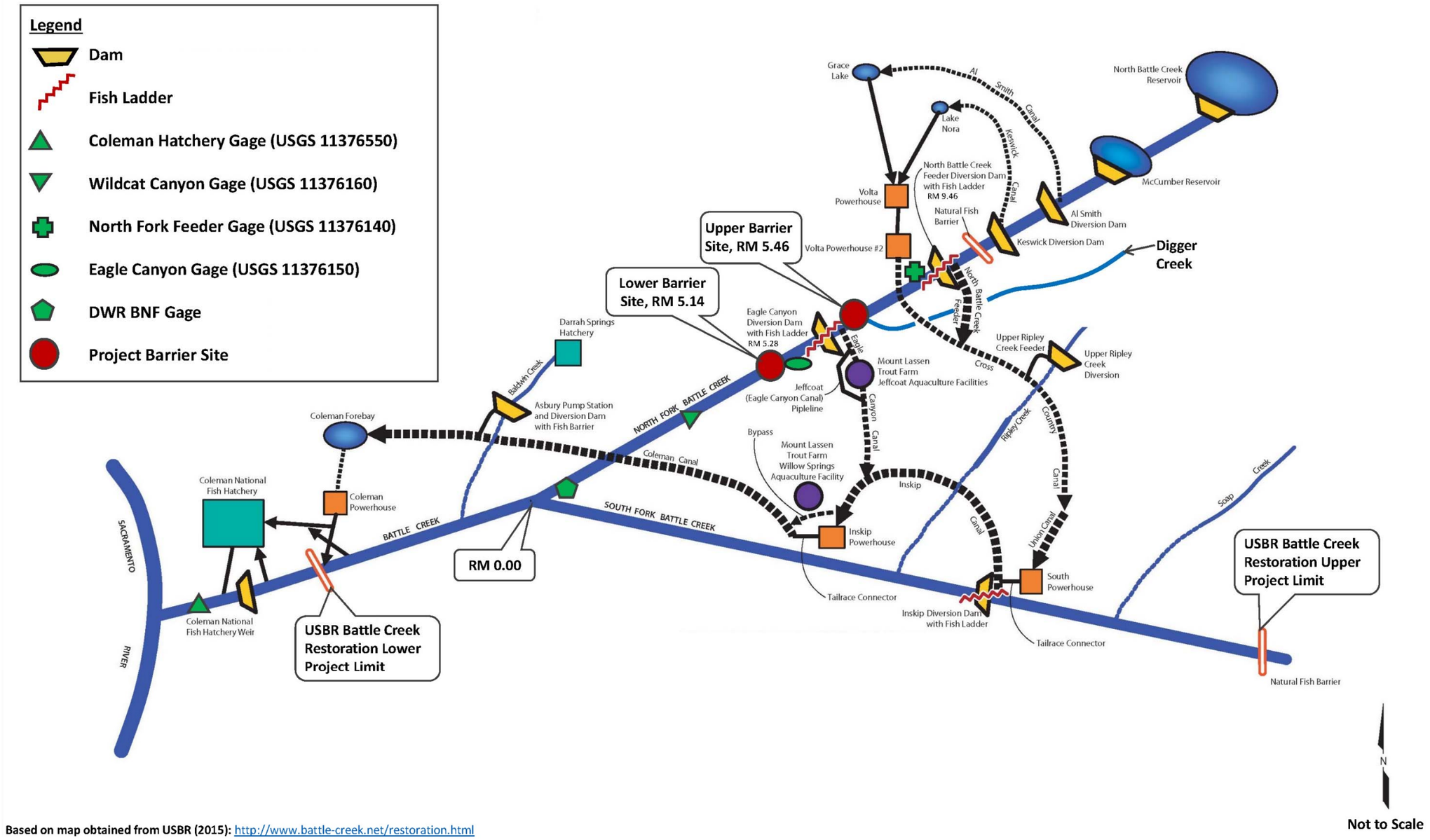
PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

Attachment 1: North Fork Battle Creek Infrastructure (Not to scale, CO is providing for informational purposes only)



Based on map obtained from USBR (2015): http://www.battle-creek.net/restoration.html

END OF SECTION

SECTION 52 00 00

DRAWINGS

PART 1 GENERAL

1.1 DISCREPANCIES, ERRORS, OR OMISSIONS

A. Inform the COR of discrepancies discovered on drawings as soon as they are discovered. The COR will make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense.

1.2 PROJECT CONDITIONS

A. Where there are differences as determined by the CO between details and dimensions shown on drawings and details and dimensions of existing features at jobsite, use details and dimensions of existing features at jobsite.

1.3 INFORMATION DRAWINGS

A. Drawings marked "For Information Only" in the drawing list are included to show existing features about which knowledge is required to perform work under this contract. These drawings do not show work to be performed under this contract.

B. If there are differences as determined by the CO between details and dimensions shown on these drawings and those of existing features at jobsite, use details and dimensions of existing features at jobsite.

1.4 STANDARD DRAWINGS

A. Standard drawings may show details which are not a part of work under this contract. Disregard details shown on these drawings which are not applicable to work under this contract.

1.5 COPIES OF DRAWINGS

A. One set of full-size (22 inches by 34 inches) drawings, except standard drawings, will be furnished to the Contractor.

B. Upon request, additional half-size (11 inches by 17 inches) copies of standard drawings will be furnished to the Contractor.

1.6 LIST OF DRAWINGS

A. Drawings listed in Table 52 00 00A - List of Drawings are made a part of Section C - Description/Specifications.

1.7 DRAWING NUMBERS IN NUMERICAL ORDER

A. Specification drawings are listed in numerical order in Table 52 00 00B - Drawings in Numerical Order.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

Table 52 00 00A – List of Drawings

Sheet Number	Drawing	Sheet Title
General		
1	G-1	Project Title Sheet
2	G-2	Drawing List and Legend
3	G-3	Existing Cond., Sheet Index & Access Map
Lower Barrier Site		
4	C-1	Contractor Access & Use Area Option 1
5	C-2	Contractor Access & Use Area Option 2
6	C-3	Eagle Canyon Section
7	C-4	Horizontal and Vertical Control
8	C-5	Water Management Plan & Profile
9	C-6	Demo Plan
10	C-7	Demo Photographs
11	C-8	Design Plan, Profile, Details, & Notes
12	C-9	Sections, 1 of 2
13	C-10	Sections, 2 of 2
Upper Barrier Site		
14	C-11	Access & Use Area Option 1 Plan
15	C-12	Access & Use Area Option 2 Plan
16	C-13	Access & Use Area Option 1 & 2 Sections
17	C-14	Horizontal and Vertical Control
18	C-15	Water Management, 1 of 2
19	C-16	Water Management, 2 of 2
20	C-17	Demo Plan
21	C-18	Demo Photographs
22	C-19	Conceptual Channel Design Plan & Profile
23	C-20	Channel Modification Notes
24	C-21	Hydraulic Structure Typicals
25	C-22	Weir Construction Plan & Photos
26	C-23	Concrete Weir Section & Detail
Project Details		
27	C-24	Project Details and Typicals