EBBETTS PASS REDWOOD WATER STORAGE TANKS WILDFIRE HAZARD MITIGATION PROJECT

CCWD CIP No. 11095
CAL OES/FEMA DR-4344/PJ0119

BID PACKAGE

JUNE 3, 2021

Proposal will be received at the office of:

Calaveras County Water District
120 Toma Court
San Andreas, California 95249
no later than

2:00 p.m. local time on JUNE 29, 2021

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SECTION 00100
ADVERTISEMENT FOR BIDS

CALAVERAS COUNTY WATER DISTRICT
EBBETTS PASS REDWOOD WATER STORAGE TANKS
WILDFIRE MITIGATION PROJECT

Sealed bids for the Ebbetts Pass Redwood Water Storage Tanks Wildfire Hazard Mitigation Project will be received by Calaveras County Water District at the office of Calaveras County Water District at 120 Toma Court, San Andreas California 95249 no later than **2:00 PM local time on June 29, 2021**, at which time the Bids will be publicly opened and read. A District representative will be available at the front entrance of District office starting approximately 30 minutes prior to bid closing to collect bids. Bids via FEDEX or UPS will be accepted but they need to be inside a separately sealed envelope inside the FEDEX or UPS packaging and advise that they be delivered a day early to assure receipt prior to the bid opening date and time. The District will not accept responsibility for lost, misplaced, or delayed packages, if they cannot be readily located prior to or at the date and time of the bid opening.

This Project is in Calaveras County, California work will be done at five separate locations within the Communities of Camp Connell, Arnold and Forest Meadows CA. The work locations are known as Big Trees Tank 8, Big Trees Tank 4, Arnold Tank 13, Heather Drive Tank and Larkspur Court Tank. The Project will replace the Districts existing water storage tanks with fire resistant glass fused, bolted steel tanks. The Project consist of work: Demolition services and general site clean-up; the supply and installation and operation of temporary facilities to maintain customer service during construction; supply and install tank appurtenance including concrete foundation; temporary water storage; valves and piping; supply and installation of two (2) pressure sustaining altitude valves; street improvements; and the supply and installation of electrical and instrumentation improvements as indicated on the project Drawings and specified.

The District has contracted with California Aquastore under a separate procurement contract to furnish bolted steel tank materials, furnish spiral staircases, and provide erection services for the bolted steel tanks. The Contractor will be required to coordinate onsite construction work with the District and California Aquastore.

This Project includes Federal Domestic Preferences for Procurements, 2 C.F.R. § 200.322. The Contractor shall purchase products and materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products such as polyvinyl chloride pipe, aggregates such as concrete, glass, optical fiber, and lumber)

This Project is Funded in Part by the United States Federal Emergency Management Agency (FEMA)/Cal-OES. The Project is subject to numerous permits, provisions and environmental constraints that must be adhered to during course of the work.

The Engineer's estimate of probable cost is $1.5 million.

The Bidding Documents are available at:

Calaveras County Water District
120 Toma Ct.
San Andreas, CA 95249
Contact: Kevin Williams
Phone: (209) 753-3184

Dodge Data & Analytics
4300 Beltway Place, Suite 180
Arlington TX, 76018
Phone: (800) 393-6343

Sacramento Regional Builders Exchange
5370 Elvas Avenue
Sacramento, CA 95819
Phone: (916) 442-8991

Placer County Builders Exchange
10656 Industrial Ave, Suite 160
Roseville, CA 95678
Phone: (916) 771-7229

Builders' Exchange of Stockton
4561 Quail Lakes Drive, Suite B-2
Stockton, CA 95207
Phone: (209) 478-1000

Bay Area Builders Exchange
3055 Alvarado Street
San Leandro, CA 94577
Phone: (510) 483-8880

Valley Builders Exchange
1118 Kansas Avenue
Modesto, CA 95351
Phone: (209) 522-9031

Central CA Builders Exchange
1244 N Mariposa Street
Fresno, CA 93703
Phone: (559) 237-1837

Questions regarding the Bidding Documents shall be directed to:

Calaveras County Water District
120 Toma Court
San Andreas, CA 95249
Phone (209) 754-3184 / Fax (209) 754-9620
Attn: Kevin Williams
Email: kevinw@ccwd.org

A pre-bid conference will be held at 10:00 am local time on June 17, 2021 at Calaveras County Water District Office, 120 Toma Court, San Andreas CA, 95249. Attendance at the pre-bid conference is highly encouraged but is not mandatory, District Staff will be available after the pre-bid conference for site visits with prospective bidders. All bidders are required to visit and inspect sites prior to submitting bids.

Prospective Bidders shall be licensed Contractors in the State of California and shall be skilled and regularly engaged in the general class or type of work called for under the Contract. Each Bidder shall have a Class A – General Engineering California Contractor's

license. Bidders shall submit a statement of qualifications and at least three (3) references of representative projects of same size and complexity upon request of the District. The Bidders experience shall include construction of concrete foundations and installation of underground water transmission/distribution mains.

The existing tanks removed as part of the Project will become Property of the Contractor. For accounting purposes, the Contractor will need to provide the District the estimated salvage value of the existing redwood materials removed from the Project. The estimate is not required to be submitted at time of bid but will be required prior to Contract Award.

All contractors and subcontractors shall be registered with the California Department of Industrial Relations (DIR) pursuant to Labor Code Section 1725.5 to be qualified to bid on this project or to be listed as a subcontractor for this project pursuant to Public Contract Code Section 4104. Bidders will be required to submit proof of registration for themselves and all listed subcontractors prior to award of the contract.

Owner:	Calaveras County Water District
By:	Kevin Williams, P.E.
Title:	Senior Civil Engineer
Date:	June 3, 2021

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INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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ARTICLE 1 - DEFINED TERMS

1.1 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. Issuing Office--The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2 - BIDDING DOCUMENTS

2.1 Bidders shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.2 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.3 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents form such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.4 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.5 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

3.1 Bidder is to submit the following information with to demonstrate Bidder's qualifications to perform the Work:

To demonstrate Bidder's qualifications to perform the Work, within five days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below. The Bidder and his subcontractors are required to have a valid, active license issued by the California, Contractors State License Board. The Bidder shall have a Class A, General Engineering Contractor. Bidders shall submit a statement

of qualifications and at least three (3) references of representative projects of same size and complexity upon request of the District. The Bidders experience shall include construction of concrete foundations and installation of underground water transmission/distribution mains.

ARTICLE 4 - PRE-BID CONFERENCE

4.1 A pre-bid conference will be conducted for this Project.

4.2 Information presented at the pre-bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-Bid conference will not be binding or legally effective, unless incorporated in an Addendum.

ARTICLE 5 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.1 Site and Other Areas

A. The site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by the Contractor.

5.2 Existing Site Conditions

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
    a. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Bidding Documents.
    b. Those drawings of physical conditions in or relating to existing surface and subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Bidding Documents.
    c. Reports and drawings known to the Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the site.
    d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

5.3 Other Site-related Documents

A. No other Site-related documents are available.

5.3 Owners Safety Program

A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.4 Other Work at the Site

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any

ARTICLE 6 – BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.1 Express Representations and Certifications in Bid Form, Agreement

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidders should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7- INTERPRETATIONS AND ADDENDA

7.1 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.2 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

Calaveras County Water District
120 Toma Court
San Andreas, CA 95249
Phone (209) 754-3184 / Fax (209) 754-9620
kevinw@ccwd.org
Attn: Kevin Williams, P.E.

7.3 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date of opening of Bids may not be answered.

7.4 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8 - BID SECURITY

8.1 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such bid bond will be issued in the form included in the Bidding Documents.

8.2 The Bid security of the Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

8.3 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.4 The Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9 - CONTRACT TIMES

9.1 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.

9.2 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10 – SUBSTITUTE AND "OR EQUAL" ITEMS

10.1 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or-equal" or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. Each such

request shall include the Manufacturer's Certification for Compliance with AIS. Refer to the Manufacturer's Certification form provided in these Construction Contract Documents. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner. Substitutes and "or-equal" materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.05 and 7.06 of the General Conditions after the Effective Date of the Contract. Each such request shall include Manufacturer's Certification letter for compliance with Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A – Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference, if applicable. Refer to Manufacturer's Certification Letter provided in these Contract Documents.

10.2 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 11 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.1 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

11.2 If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.3 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided n Paragraph 7.07 of the General Conditions.

ARTICLE 12 – PREPARATION OF BID

12.1 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects too not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”

12.2 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents, The printed copy of the Bid Form must be clearly legible, printed on 81/2-inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.3 A bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.4 A bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.5 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.6 A bid by an individual must show the Bidder’s name and official address.

12.7 A bid by a joint venture must be executed by an authorized representative of each joint venture in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.8 All names must be printed in ink below the signatures.

12.9 The Bid must contain an acknowledgement of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of a Bidder’s authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder’s licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder’s state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13 - BASIS OF BID

13.1 Base Bid

A. Bidders must submit a Bid for the lump sum and/or unit price items as set forth in the Bid Form.

13.2 Unit Price

A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

13.3 Allowances

A. For cash allowances, the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14 – SUBMITTAL OF BID

14.1 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.

14.2 A bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED". A mailed bid must be addressed to the location designated in the Advertisement.

14.3 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15 - MODIFICATION AND WITHDRAWAL OF BID

15.1 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.2 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.1 and submit a new Bid prior to the date and time for the opening of Bids.

15.3 If within 24 hours after Bids are opened and Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16 - OPENING OF BIDS

16.1 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.1 All bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return Bid security prior to the end of this period.

ARTICLE 18 – EVALUATION OF BIDS AND AWARD OF CONTRACT

18.1 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.2 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.3 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.4 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.5 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all bidders a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

C. For determination of the apparent low Bidder when unit prices are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

18.6 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identify of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

18.7 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19 – BONDS AND INSURANCE

19.1 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

19.2 Article 8, Bid Security, of these instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20 – SIGNING OF AGREEMENT

20.1 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 21 - SALES AND USE TAXES

21.01 Contractor shall pay all sales, use and other taxes as specified in Paragraph 7.10 of the General Conditions.

ARTICLE 22 – CONTRACTS TO BE ASSIGNED

22.1 There are no procurement contracts of which the Contractor will be required to accept assignment previously entered into by the Owner for the direct purchase of goods and special services.

ARTICLE 23 – FEDERAL REQUIREMENTS

23.1 If the contract price is in excess of $100,000, provisions of the Contract Work Hours and Safety Standards Act at 29 CFR 5.5(b) apply.

23.2 Federal requirements at Article 19 of the Supplemental Conditions apply to this Contract.

23.2 Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A – Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All iron and steel products used in this project must be produced in the United States. The term “iron and steel products” means the following products made primarily of iron and steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials. The de minimis, minor components, and pig iron and direct reduced iron waivers apply to this Contract. Refer to Section 01000 in these contract documents for additional guidance for complying with American Iron and Steel requirements.

ARTICLE 24 - WORKERS’ COMPENSATION REQUIREMENTS

24.1 As required by Section 1860 of the California Labor Code and in accordance with the provisions of Section 3700 of the Labor Code, every contractor will be required to secure the payment of workers’ compensation to its employees.

24.2 In accordance with Section 1861 of the California Labor Code, the contractor shall furnish the owner with a statement as follows: “I am aware of the provisions of 3700 of the Labor Code which requires every employer to be insured against liability for worker’s compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.”

ARTICLE 25 – WAGE RATE REQUIREMENTS

25.1 The prevailing wage rates of the State of California apply to this contract as do any requirements of the State of California associated with the use of these State Prevailing wages.

25.2 Prevailing Wages: Notice is hereby given that pursuant to 1773 of the Labor Code of the State of California, the owner has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holidays and

overtime work for each craft, classification, or type of worker required to execute the contract. A copy of said prevailing rate of per diem wages is on file in the principal office of the owner, to which reference is hereby made for further particulars. Said prevailing rate of per diem wages will be made available to any interested party upon request, and a copy thereof shall be posted at each job site.

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

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

25.5 Requirements: Contractor agrees to comply with Sections 1777.5, 1777.6 and 1777.7 of the California Labor Code relating to the employment of apprentices. The responsibility for compliance with these provisions is fixed with the prime contractor for all apprenticeship occupations. Under these sections of the law, contractors and subcontractors must employ apprentices in apprenticeship occupations, where journeymen in the craft are employed on the public work, in a ratio of not less than one apprentice hour for each five journeymen hours (unless an exemption is granted in accordance with 1777.5) and contractors and subcontractors shall not discriminate among otherwise qualified employees as indentured apprentices on any public work solely on the ground of race, religious creed, color, national origin, ancestry, sex, or age, except as provided in 3077 of the Labor Code. Only apprentices, as defined in 3077, which provides that an apprentice must be at least 16 years of age, who are in training under apprenticeship standards and who have signed written apprentice agreements will be employed on public works in apprenticeship occupations.

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

ARTICLE 26 – SUBCONTRACTOR LISTING LAW

26.1 In accordance with Section 4104 of the California Public Contract Code, each bidder, in his or her bid, shall set forth the name and the location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent of the prime contractor's total Lump Sum bid.

26.2 In accordance with Section 4107 of the California Public Contract Code, no contractor whose bid is accepted shall without consent of the owner either: (a) substitute a person as a subcontractor in place of the subcontractor listed in the original bid; or (b) permit a subcontract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the original bid; or (c) sublet or subcontract any portion of the work in excess of one-half of one percent of the prime contractor's total bid as to which his or her original bid did not designate a subcontractor.

26.3 Penalties for failure to comply with the foregoing sections of the California Public Contract Code are set forth in Sections 4106, 4110, and 4111 of the Public Contract Code. A prime contractor violating this law violates his or her contract and the awarding authority may exercise the option, in its own discretion, of (1) canceling his or her contract or (2) assessing the prime contractor a penalty in an amount of not more than 10 percent of the amount of the subcontract involved, and this penalty shall be deposited in the fund out of which the prime contract is awarded. In any proceedings under this section the prime contractor shall be entitled to a public hearing and to five day's notice of the time and place thereof.

ARTICLE 27 – REGISTRATION WITH DEPARTMENT OF INDUSTRIAL RELATIONS

27.1 This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code Section 1711.1(a)]. No contractor or subcontractor may be awarded a contract for public work on a public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section

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SECTION 00211
SEQUENCE OF CONSTRUCTION

1.0 PROJECT COORDINATION AND COOPERATION

Calaveras County Water District (CCWD) has contracted with California Aquastore to furnish and erect bolted steel tank and attached spiral staircase. Contractor will be required to attending weekly construction coordination meetings when there is upcoming and ongoing work, provide an up-to-date look ahead schedule on weekly basis, and long-term schedule monthly and when the schedule changes.

2.0 PROJECT SEQUENCE

Project sequence will begin with Construction of Heather Dr. Tank and Big Trees Tank 8, these two locations should be constructed and ready for service within the first construction season (July 15– November 30, 2021). CCWD anticipates that the tanks materials will be ready for delivery and erection after August 16, 2021 for both Big Trees 8 and Heather Drive Tank. Larkspur Tank, Big Trees Tank 4 and Arnold Tank 13 tank materials will be available for 2022 construction season.

Larkspur Tank, Big Trees Tank 4 and Arnold Tank 13 to be constructed and ready for service within the second construction season (May 1 – November 30, 2022).

Erection of the bolted steel tank and spiral staircases furnished and installed by the District Tank Supplier California Aquastore will require approximately 3-4 weeks per location to complete the erection.

Modifications to the sequence of work maybe made upon agreement between CCWD, the Contractor, and Tank Supplier. Big Trees Tank 8 and Big Trees Tank 4 cannot be worked on concurrently. Larkspur Tank and Heather Tank cannot be worked on concurrently.

3.0 PROJECT SCHEDULE

The Contractor shall provide the District a long-term project schedule within 5 Days of issuance of Notice to Proceed (NTP). The Project Schedule will need to allow for completion of the project within the required timeframe including existing tank demolition, site grading, concrete, concrete reinforcing steel, electrical, and underground piping.

END OF SECTION

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SECTION 00410
BID FORM FOR CONSTRUCTION CONTRACT

REDWOOD WATER STORAGE TANKS
WILDFIRE HAZARD MITIGATION PROJECT

ARTICLE 1 – OWNER AND BIDDER

1.1 This Bid is submitted to:

Calaveras County Water District
120 Toma Court
San Andreas CA

1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – ATTACHMENTS TO THIS BID

2.1 The following documents are submitted with and made a condition of this Bid:

A. Bid Bond
B. Compliance Statement/Certification of Non-Segregated Facilities (RD 400-6);
C. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tiered Covered Transactions (AD-1048);
D. List of Proposed Subcontractors;
E. Non-Collusion Affidavit;
F. Workers Compensation Certification;
G. Evidence of authority to do business in California; or a written covenant to obtain such license within the time for acceptance of Bids;
H. Evidence of Contractor's License Number or evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of bids;

ARTICLE 3 - BASIS OF BID- LUMP SUMS/UNIT PRICES

3.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price

1	Mobilization/Demobilization	LS	1		
2	Encroachment Permits and Traffic Control	LS	1		
3	Stormwater Pollution Prevention	LS	1		
4	A.C. Paving Removal/Replacement	Tons	210		
5	Site Demolition	LS	1		
6	Altitude Valve Station	EA	2		
7	Heather Tank Site	LS	1		
8	Big Trees Tank 4 Site	LS	1		
9	Big Trees Tank 8 Site	LS	1		
10	Arnold 13 Tank Site	LS	1		
11	Larkspur Tank Site	LS	1		
12	Temporary Water Storage Systems and Temporary Piping	LS	1		
13	Level Sensors and Electrical	LS	1		
Total of All Bid Items					$

_____**DOLLARS**

TOTAL BID AMOUNT (WRITTEN)

Bidder acknowledges that:

1. Each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and

2. Estimated quantities are not guaranteed, and are solely for the purposes of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities as determined as provided in the Contract Documents.

3.02 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to

acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

DESCRIPTIONS OF BID ITEMS

BID ITEM NO.1 – MOBILIZATION/DEMOBILIZATION

This item consist of preparatory work and operations, including, but not limited to those necessary for the movement of personnel, equipment, supplies, and incidentals to the site; securing performance and payment bonds and required insurance, establishing a field office (if applicable) and staging areas; preparing schedules and sequencing plans, submitting shop drawings; furnishing and installing project signs (4 Total), permits, temporary erosion control and for all other work and operations to be performed, or costs incurred, prior to beginning the Work. Contractor shall provide and maintain portable toilet(s) on-site for use by Contractor and subcontractor employees. Demobilization shall include, but not limited to, removal of all waste materials, debris, final cleanup of construction and staging areas, permanent erosion control and issuance of maintenance bond. Contractor shall submit no greater than two percent (2%) of the total Contract Sum for this Bid Item.

BID ITEM NO.2 – ENCROACHMENT PERMITS & TRAFFIC CONTROLS

As necessary to complete all work within the road right-of-way, the Contractor shall provide all labor, equipment and materials and perform all work and coordination to implement and comply with encroachment permits as issued by the County Public Works. The District will submit a preliminary permit application as "Owner" and pay all fees directly invoiced by the County. The Contractor shall prepare and file all paperwork to complete Contractor's part of the encroachment permits and must comply with all requirements and conditions as listed "Contractor" under the permit. The Contractor shall prepare/submit specific traffic control plans meeting requirements and approval of the County, and shall fully support and implement traffic control plans including all signage, flaggers, barricades, k-rail, safety devices, etc. Temporary traffic control plans shall be designed and implemented in accordance with California Manual on Uniform Traffic Control Devices (MUTCD). Contractor shall schedule and notify the County of all road lane closures and other encroachments within the right of way.

BID ITEM NO.3 – STORM WATER POLLUTION PREVENTION (SWPPP/BMP'S)

This item includes all labor, materials, equipment for preparing, furnishing, installing and maintaining a project specific Storm Water Pollution Prevention Plan (SWPPP) and Best Management Practices (BMP's) to comply with the Construction General Permit 2009-0009-DWQ (amended by 2010-0014-DWQ and 2012-0006-DWQ). SWPPP shall be filed electronically with State's Storm Water Monitoring and Report Tracking System (SMARTS), prepared by a Qualified SWPPP Developer (QSD) and implemented under direction of a Qualified SWPPP Practitioner (QSP) licensed by the California Stormwater Quality Association (CASQA). All work shall be according to the latest version of the CASQA Construction BMP Online Handbook, which is available on their website www.casqa.org. BMP's shall be provided for run-on control, soil stabilization, erosion control, sediment control, tracking control, wind erosion, material pollution prevention and waste management, and stockpile management. Each day if trenching, excavating and/or tracking dirt onto roads/highways, all trench spoils and excess waste excavated materials shall be removed and area mechanically swept and/or vacuumed to thoroughly clean all pavement surfaces. Contractor's operations shall preserve existing vegetation not in the immediate construction zone and shall not be conducted in a method/manner that allows trench spoil or backfill materials to directly enter into any creeks, stream, drainage or roadside ditches. All existing drainages shall be protected during construction and cleaned of all trench spoil, debris and returned to free flowing, functional condition upon

project closeout. All disturbed soil areas shall be stabilized by appropriate BMP's as soon as possible so each completed area can be closed out and removed from the SWPPP permit with the goal of limiting further monitoring and reporting in completed areas. After demobilization, Contractor's responsibility shall continue during guarantee period until a Notice of Termination (NOT) is filed and accepted by the Regional Board.

BID ITEM NO.4– ASPHALT CONCRETE PAVEMENT REMOVAL/REPLACEMENT

Paving materials, equipment, spreading and compacting procedures shall conform to Section 39, Caltrans Standard Specifications. The Contractor shall provide all labor, equipment and materials for saw-cutting, disposal of existing pavement and replacement with new hot mix asphaltic concrete paving. A clean, straight saw cut shall be made along all edges between new and existing pavement and grind out transitions and overlays. All water and slurry generated during saw cutting work shall be immediately vacuumed and removed to prevent migration off the pavement and stop it from entering storm drains, drainages, etc. Final pavement shall be placed with a paver machine and compacted to the compaction level intended by the mix design. Final paving thickness shall be determined in the field by CCWD and Calaveras County; minimum thickness of placed and compacted AC paving shall be 3-inches and thickness shall match existing in County public roads unless otherwise directed by CCWD. Payment shall be for weight of hot mix AC paving delivered (submit daily truck tags) and placed and meeting quality standards; finished surface shall be thoroughly compacted, smooth and free from ruts, humps, depressions, or irregularities.

BID ITEM NO.5 – SITE DEMOLITION

Demolition includes removal and disposal of existing facilities at Larkspur Tank Site, Heather Tank Site, Arnold 13 Tank Site, Big Trees Tank 4 Tank Site, and Big Trees Tank 8 Site including tank piping, existing altitude valves, site fencing, valves, ladders, redwood tanks, existing tank foundations, portion of existing planter at Arnold Tank 13 as shown on Drawings C-1 and C-10 and specified. Work includes salvaging existing redwood materials from Tank demolition, for accounting purposes the Contractor

BID ITEM NO.6 – ALTITUDE VALVE STATION

This item includes providing all labor, equipment and materials required to furnish and install altitude valves as shown on the project drawings Sheets D2, C3, C4, C-5, and C-6 and specifications Section 15114. The altitude valve station shall be provided with 6" (Arnold 13 Tank Location), and 8" (Larkspur Tank Location) altitude control valves, precast concrete vault and cover, resilient wedge gate valves (8"/6" sizes), gauges, 1" copper sensor line from vault to tank and other accessories as shown on Detail F, Sheet D2. The concrete vault and cover shall be H20 traffic rated and manufactured/supplied by Jensen Precast, Oldcastle, or equal. The cover shall be H20 incidental traffic rated aluminum diamond plate double door, frame cast-in to cover slab and furnished with torsion assist, hold open arms, and stainless-steel hardware. The vault shall be placed on a 6" thick layer of ¾" crushed stone leveling course over filter fabric and between the excavation and vault walls backfill shall be Class 2 AB. Also, the Contractor shall provide: A) all new upstream and downstream piping, B) demolition and removal of existing Altitude valve station vault and backfilling void to 95% relative compaction, C) demolition and removal of existing Altitude station piping and capping and concrete plugging abandoned, inactive portions of water mains. Contractor shall clean, disinfect, flush and hydrostatic test the new Altitude Valve station. Hydrostatic tests shall be performed before making connections to the existing system. Contractor shall set/check final operating pressures provide by the District. Payment shall be paid as (Each) for completing the Altitude Valve station furnished and installed, disinfected, tested and placed into service by Contractor, as accepted by District, and completing demolition and other related items of work.

BID ITEM NO.7 – HEATHER TANK SITE

This item includes providing all labor, equipment and materials required to complete the site work and site piping at Heather Tank including excavating, scarifying and preparing tank foundation subgrade; placing and compacting Class 2 AB and Chip Stone; excavate, place, install and cure reinforced concrete ringwall footing; provide valves and piping (inlet, outlet, drain and overflow drain) including flexible expansion joints (Romac and EBBA); Site Restoration including contour grading; placing mulch erosion control; cleaning, disinfection, flushing and hydrostatic testing of new piping; install new drainage box with SDR 35 outlet piping and ¼ Ton Rip Rap, miscellaneous concrete including thrust blocks, stairway pads, and concrete curb/gutter restoration.

BID ITEM NO.8 – BIG TREES 4 TANK SITE

This item includes providing all labor, equipment and materials required to complete the site work and site piping at Big Trees 4 Tank Site including excavating, scarifying and preparing tank foundation subgrade; placing and compacting Class 2 AB and Chip Stone; excavate, place, install and cure reinforced concrete ringwall footing; dewatering excavation; provide valves and piping (inlet, outlet, drain and overflow drain) including flexible expansion joints (Romac and EBBA) and connection to existing pump station; Site Restoration including contour grading; placing mulch erosion control; cleaning, disinfection, flushing and hydrostatic testing of new piping; install new drainage box with SDR 35 outlet piping and ¼ Ton Rip Rap, miscellaneous concrete including thrust blocks, stairway pads.

BID ITEM NO.9 –TREES 8 TANK SITE

This item includes providing all labor, equipment and materials required to complete the site work and site piping at Big Trees 8 Tank Site including excavating, scarifying and preparing tank foundation subgrade; placing and compacting Class 2 AB and Chip Stone; removing trees; excavate, place, install and cure reinforced concrete ringwall footing; constructing earthen v-ditch; provide valves and piping (inlet, outlet, drain and overflow drain) including flexible expansion joints (Romac and EBBA); Site Restoration including contour grading; placing mulch erosion control; cleaning, disinfection, flushing and hydrostatic testing of new piping; install new drainage box with SDR 35 outlet piping and ¼ Ton Rip Rap, miscellaneous concrete including thrust blocks, stairway pads.

BID ITEM NO.10 – ARNOLD 13 TANK SITE

This item includes providing all labor, equipment and materials required to complete the site work and site piping at Arnold 13 Tank Site including excavating, scarifying and preparing tank foundation subgrade; placing and compacting Class 2 AB and Chip Stone; excavate, place, install and cure reinforced concrete ringwall footing; provide valves and piping (inlet, outlet, drain and overflow drain) including flexible expansion joints (Romac and EBBA); Site Restoration including contour grading; placing mulch erosion control; cleaning, disinfection, flushing and hydrostatic testing of new piping; miscellaneous concrete including thrust blocks, stairway pads and pipe suppports.

BID ITEM NO.11 –LARKSPUR TANK SITE

This item includes providing all labor, equipment and materials required to complete the site work and site piping at Larkspur Tank Site including excavating, scarifying and preparing tank foundation subgrade; placing and compacting Class 2 AB and Chip Stone; removing trees; excavate, place, install and cure reinforced concrete ringwall footing; constructing earthen v-ditch; provide valves and piping (inlet, outlet, drain and overflow drain) including flexible expansion joints (Romac and EBBA); Site Restoration including contour grading; placing mulch erosion control; cleaning, disinfection, flushing and hydrostatic testing of new piping; install new drainage box with SDR 35 outlet piping and ¼ Ton Rip Rap, miscellaneous concrete including thrust blocks, stairway pads.

BID ITEM NO.12 – TEMPORARY WATER STORAGE SYSTEMS AND TEMPORARY PIPING

This item includes providing all labor, equipment and materials required to furnish and install and remove temporary water storage systems and temporary piping including all piping, temporary potable water storage tanks, valves and tie-in as shown on Drawings C1, C3, C5, C9, and D1 and specified in Section 13210; hydrostatic test, disinfect (per AWWA C652), flush tank and piping and confirm passing bacteriological tests before placing into service; upon completing new construction remove temporary facilities. The District has two temporary water storage tanks the Contractor can use during construction, the Contractor will be responsible for relocating the tanks to the location where they will be needed.

BID ITEM NO.13 – SENSORS AND ELECTRICAL EQUIPMENT

This item includes providing all labor, equipment and materials required for installation of electrical and instrumentation equipment at the Big Trees Tank 8, Big Trees Tank 4, Larkspur Tank, and Heather Tank sites as shown on the Drawings and specified.

ARTICLE 4 – TIME OF COMPLETION

4.1 Bidder agrees that the Work will be substantially complete and will be completed and ready for payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar or working days indicated in the Agreement.

4.2 Bidder agrees that the Work will be substantially complete within **365 calendar** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **400 calendar** days after the date when the Contract Times commence to run.

ARTICLE 5 - BIDDER'S ACKNOWLEDGEMENTS; ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.1 Bid Acceptance Period

A. This Bid will remain subject to acceptance for **90 days** after the Bid Opening, or for such longer period of time that Bidder may agree to in writing upon request of the Owner.

5.2 Instructions to Bidders

A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.3 Receipt of Addenda

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum No.	**Addendum Date**
_____	_____
_____	_____
_____	_____
_____	_____

ARTICLE 6 – BIDDERS REPRESENTATIONS AND CERTIFICATIONS

6.1 Bidder's Representations

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.

2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Bidder is familiar with all Laws and regulations that may affect cost, progress, ad performance of the Work.

4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical in such reports and drawings.

5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified int eh Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as contractor; and (c) Bidder's (Contractor's) safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Bidder is aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 Bidder's Certifications

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization or corporation.

2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

3. Bidder has not solicited of induced and individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of Paragraph 6.02.A:

a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of the Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to in fluence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

_____
(typed or printed name organization)

By: _____
(individual's signature)

Name:
_____
(typed or printed)

Title:
_____
(typed or printed)

Date:_____
_
(typed or printed)

I*f Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.*

Attest:
_____
(individual's signature)

Name:
_____
(typed or printed)

Title:
_____
(typed or printed)

Date:_____
_
(typed or printed)

Address for giving notices:

_____
__

_____
__

Bidder's Contact:

Name:
_____

(typed or printed)

Title:

_____

(typed or printed)

Phone:_____

_

Email:_____

__

Address:

_____

_____

_____

Bidder's Contractor License No.:_____

Employer's Tax ID Number: _____

NON COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

(Public Contract Code Section 7106)

State of California
County of _____

_____, being first duly sworn, deposes and says that he or she is_____of_ _____, the party making the foregoing bid, that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and further that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

By _____

Subscribed and sworn to before me on _____
(date)

_____
(Notary Public)

(SEAL)

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BID BOND (PENAL SUM FORM)

Bidder Name: Address *(principal place of business)*:	**Surety** Name: Address *(principal place of business)*:
Owner Name: **Calaveras County Water District** Address *(principal place of business)*: **120 Toma Court** **San Andreas, CA 95249**	**Bid** Project *(name and location)*: **Ebbetts Pass Redwood Water Storage Tanks, Wildfire Hazard Mitigation Project Calaveras County, California** Bid Due Date:
Bond Penal Sum: Date of Bond:	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:
Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation will be null and void if:

   3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

   3.2. All Bids are rejected by Owner, or

   3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.

7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

COMPLIANCE STATEMENT

This statement relates to a proposed contract with _____

_____
(Name of borrower or grantee)

I am the undersigned bidder or prospective contractor. I represent that:

1. I **[ ]** have, **[ ]** have not, participated in a previous contract or subcontract subject to Executive Order 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.

2. If I have participated in such a contract or subcontract, I **[ ]** have, **[ ]** have not, filed all compliance reports that I have been required to file in connection with the contract or subcontract.

If the proposed contract is for $50,000 or more and I have 50 or more employees, I also represent that:

3. I **[ ]** have, **[ ]** have not, previously had contracts subject to the written affirmative action program requirements of the Secretary of Labor.

4. If I have participated in such a contract or subcontract, I **[ ]** have, **[ ]** have not, developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required or me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to either the RHS, RBS, or RUS, or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term “segregated facilities” means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods): (See Reverse).

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR CERTIFICATIONS OF NON-SEGREGATED FACILITIES

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually)

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date: _____

_____
Signature of Bidder or Prospective Contractor

_____
Address (including Zip Code)

SECTION 00450
CERTIFICATION REGARDING DEBARMENT

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions.

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 7 CFR Part 3017.510, Participants' responsibilities. The regulations were published as Part IV of the January 30, 1989, Federal Register (pages 4722-4733).

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

_____

Organization Name Project Name

_____

Name(s) and Title(s) of Authorized Representative(s)

_____

Signature(s) Date

Instructions for Certification

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principles. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly entered into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

CERTIFICATION FOR CONTRACTS, GRANTS AND LOANS

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant or Federal loan, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant or loan.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant or loan, the undersigned shall complete and submit Standard From – LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including contracts, subcontracts, and subgrants under grants and loans) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code.
Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

_____ _____
(Name) (Date)

_____
(Title)

APPENDIX D: CCWD STANDARD DRAWINGS

CONTRACTOR'S CERTIFICATION REGARDING WORKERS' COMPENSATION INSURANCE

State of California

County of _____

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commending the performance of the work of this Contract.

_____
(Name of Contractor)

by:_____

_____
(Signature of Contractor)

Date: _____

.

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LIST OF SUBCONTRACTORS

NOTE: In accordance with Supplementary Condition SC-7.07.A- the Contractor shall not award work valued at more than fifty percent (50%) of the Contract Price to Subcontractors without prior written approval of the Owner.

Work to be Performed	Percent of Total Contract	Subcontractor's Name and Location of Business

(Add additional sheets if necessary)

BIDDER: _____

Date: _____

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NOTICE OF AWARD

Date of Issuance:

Owner: Calaveras County Water District | Owner's Project No.: 11095

Engineer: | Engineer's Project No.:

Project: **Ebbetts Pass Water Storage Tank, Wildfire Hazard Mitigation Project**

Contract Name:

Bidder:

Bidder's Address:

You are notified that Owner has accepted your Bid dated _____ for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

Calaveras County Water District-Ebbetts Pass Water Storage Tanks, Wildfire Hazard Mitigation Project

The Contract Price of the awarded Contract is $_____. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

Three unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☒ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner three counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **Calaveras County Water District**

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Copy: Engineer

THIS PAGE INTENTIONALLY LEFT BLANK

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT

This Agreement is by and between **Calaveras County Water District** ("Owner") and **_____** ("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: The Project will replace all of existing conventional manual, direct read water meters with radio read meters along with constructing a fixed network of data collectors to automatically read the new water meters.

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Advanced Metering Infrastructure Project

ARTICLE 3—ENGINEER

3.01 The Owner has retained **Kevin Williams, P.E., Senior Civil Engineer** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by Calaveras County Water District.

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Days*

A. The Work will be substantially complete within **365** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **390** days after the date when the Contract Times commence to run.

4.05 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and

Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner **$1,000** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **$600** for each day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion, and final completion are not additive, and will not be imposed concurrently.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

ARTICLE 5—CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

A. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
1	Mobilization/Demobilization	LS	1		
2	Encroachment Permits and Traffic Control	LS	1		
3	Stormwater Pollution Prevention	LS	1		
4	A.C. Paving Removal/Replacement	Tons	210		
5	Site Demolition	LS	1		
6	Altitude Valve Station	EA	2		

7	Heather Tank Site	LS	1		
8	Big Trees Tank 4 Site	LS	1		
9	Big Trees Tank 8 Site	LS	1		
10	Arnold 13 Tank Site	LS	1		
11	Larkspur Tank Site	LS	1		
12	Temporary Water Storage Systems and Temporary Piping	LS	1		
13	Level Sensors and Electrical	LS	1		
Total of All Bid Items					$

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the 15th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

6.02.A.1. a. 95 percent of Work completed (with the balance being retainage).

b. 95 percent of cost of materials and equipment not incorporated into the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **95** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **100** percent of

Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
    a. Performance bond (together with power of attorney).
    b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Specifications as listed in the table of contents of the project manual (copy of list attached).
6. Addenda
7. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Orders.
    d. Field Orders.
    e. Warranty Bond, if any.

B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

Owner:	Contractor:
_____	_____
(typed or printed name of organization)	*(typed or printed name of organization)*
By: _____	By: _____
(individual's signature)	*(individual's signature)*
Date: _____	Date: _____
(date signed)	*(date signed)*
Name: _____	Name: _____

_____ *(typed or printed)*	_____ *(typed or printed)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
	*(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*
Attest: _____ *(individual's signature)*	Attest: _____ *(individual's signature)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____
Designated Representative:	Designated Representative:
Name: _____ *(typed or printed)*	Name: _____ *(typed or printed)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address:	Address:
_____	_____
_____	_____
_____	_____
Phone: _____	Phone: _____
Email: _____	Email: _____
*(If **[Type of Entity]** is a corporation, attach evidence of authority to sign. If **[Type of Entity]** is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*	License No.: _____ *(where applicable)*
	State: _____

CERTIFICATE OF OWNERS ATTORNEY AND AGENCY CONCURRENCE

This attachment is to the Contract made and entered into on _____ , by and between the **Calaveras County Water District** hereinafter "Owner", and _____ hereinafter called "Contractor." This Contract is for that Work described in the Contract Documents entitled Advanced Water Metering Infrastructure Project.

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned,_____, the duly authorized and

acting legal representative of_____, do hereby certify as follows:

I have examined the attached Contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements is adequate and has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties attached Contract agreement constitutes a valid and legally binding obligation upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

_____

(Attorney's Signature) Date

AGENCY CONCURRENCE

As lender or provider of funds to the Owner to provide for the costs of this Contract, and without any liability for any payments thereunder, the Agency hereby concurs in the form, content, and execution of this Agreement.

_____

Agency Representative Date

_____

Name

NOTICE TO PROCEED

Owner:	Calaveras County Water District	Owner's Project No.:	11095
Engineer:	Kevin Williams, P.E.	Engineer's Project No.:	11095
Contractor:		Contractor's Project No.:	
Project:	Redwood Water Storage Tanks, Wildfire Hazard Mitigation Project		
Contract Name:			
Effective Date of Contract:			

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **_____** pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement:

The number of days to achieve Substantial Completion is **365 Calendar Days** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of **_____**; and the number of days to achieve readiness for final payment is **400 Calendar Days** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of **_____**.

Before starting any Work at the Site, Contractor must comply with the following:

Owner:	**Calaveras County Water District**
By *(signature)*:	
Name *(printed)*:	
Title:	
Date Issued:	

Copy: Engineer

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PERFORMANCE BOND

Contractor	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Contract**
Name: **Calaveras County Water District**	Description *(name and location)*:
Mailing address *(principal place of business)*:	Ebbetts Pass Redwood Water Storage Tanks Wildfire Hazard Mitigation Project
120 Toma Court	
San Andreas, CA 95249	Contract Price:
	Effective Date of Contract:

Bond

Bond Amount:

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____	_____
(Full formal name of Contractor)	*(Full formal name of Surety) (corporate seal)*
By: _____	By: _____
(Signature)	*(Signature)(Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:

    3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;

    3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

    3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

    5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

    5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

    5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

    5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

   7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

   7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

   7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such

statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

    14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

    14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

    14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

    14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

    14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

16. Modifications to this Bond are as follows: None.

PAYMENT BOND

Contractor	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Contract**
Name: **Calaveras County Water District** Mailing address *(principal place of business)*: **120 Toma Court** **San Andreas, CA 95249**	Description *(name and location)*: **Redwood Water Storage Tanks, Wildfire Hazard Mitigation Project** Contract Price: Effective Date of Contract:

Bond

Bond Amount:

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____	_____
(Full formal name of Contractor)	*(Full formal name of Surety) (corporate seal)*
By: _____	By: _____
(Signature)	*(Signature)(Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond will arise after the following:

    5.1. Claimants who do not have a direct contract with the Contractor

        5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

        5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).

    5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

    7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

    7.2. Pay or arrange for payment of any undisputed amounts.

    7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

    16.1. *Claim*—A written statement by the Claimant including at a minimum:

        16.1.1. The name of the Claimant;

        16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;

        16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;

        16.1.4. A brief description of the labor, materials, or equipment furnished;

16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows: None.

Contractor's Application for Payment

Owner:	Calaveras County Water District	**Owner's Project No.:**	11095
Engineer:	Calaveras County Water District	**Engineer's Project No.:**	N/A
Contractor:		**Contractor's Project No.:**	
Project:			
Contract:			
Application No.:	1	**Application Date:**	
Application Period:	**From**	**to**	

1. Original Contract Price		$ -
2. Net change by Change Orders		$ -
3. Current Contract Price (Line 1 + Line 2)		$ -
4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)		$ -
5. Retainage		
a. 5% X $ - Work Completed		$ -
b. 5% X $ - Stored Materials		$ -
c. Total Retainage (Line 5.a + Line 5.b)		$ -
6. Amount eligible to date (Line 4 - Line 5.c)		$ -
7. Less previous payments (Line 6 from prior application)		$ -
8. Amount due this application		$ -
9. Balance to finish, including retainage (Line 3 - Line 4)		$ -

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:
(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and
(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor:

Signature: **Date:**

Recommended by Engineer		**Approved by Owner**	
By:		**By:**	
Title:		**Title:**	
Date:		**Date:**	

Approved by Funding Agency			
By:		**By:**	
Title:		**Title:**	
Date:		**Date:**	

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CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: Calaveras County Water District
Engineer:
Contractor:
Project: **Redwood Water Storage Tanks, Wildfire Hazard Mitigation Project**
Contract Name:

Owner's Project No.: 11095
Engineer's Project No.:
Contractor's Project No.:

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

_____.

Date of Substantial Completion: _____

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

_____.

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

_____.

The following documents are attached to and made a part of this Certificate:

_____.

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*

a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and

recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.

    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.

    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.

    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.

39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

46. *Technical Data*

    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.

    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*: The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments

during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. *Standards Specifications, Codes, Laws and Regulations*

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. Abnormal weather conditions;

3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and

3. Technical Data contained in such reports and drawings.

B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents*: Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;

3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;

2. is of such a nature as to require a change in the Drawings or Specifications;

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;

b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review*: Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and

4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and

c. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that the proposed item:

1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) has a proven record of performance and availability of responsive service; and

4) is not objectionable to Owner.

b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:

    a. will certify that the proposed substitute item will:

        1) perform adequately the functions and achieve the results called for by the general design;

        2) be similar in substance to the item specified; and

        3) be suited to the same use as the item specified.

    b. will state:

        1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;

        2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

        3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

    c. will identify:

        1) all variations of the proposed substitute item from the item specified; and

        2) available engineering, sales, maintenance, repair, and replacement services.

    d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;

2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.

2. *Samples*

a. Contractor shall submit the number of Samples required in the Specifications.

b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.

2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:

   a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.

   b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.

   c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

   d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

1. Observations by Engineer;

2. Recommendation by Engineer or payment by Owner of any progress or final payment;

3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Shop Drawing or Sample submittal;

6. The issuance of a notice of acceptability by Engineer;

7. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design

professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and

3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to

Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

A. Engineer has the authority to reject Work in accordance with Article 14.

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:
   1. A mutually acceptable fixed fee; or
   2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
      a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
      b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
      c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
      d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
      e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
      f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.

    a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

    b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

    The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.

5. Other costs consisting of the following:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

    a. to supervise, direct, or control the Work;

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;

    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or

    e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

    a. the Work is defective, requiring correction or replacement;

    b. the Contract Price has been reduced by Change Orders;

    c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

    d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

    e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

    a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. The Contract Price has been reduced by Change Orders;

i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;

j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or

l. Other items entitle Owner to a set-off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

2. The final Application for Payment must be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all duly pending Change Proposals and Claims; and

e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such adjacent areas;
2. correct such defective Work;
3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their

reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if

repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement Standard General Conditions of the Construction Contract. The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, “Paragraph SC-4.05.”

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

B. *Evidence of Contractor’s Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

C. *Evidence of Owner’s Insurance:* After receipt from Contractor of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner in this Contract (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 *Copies of Documents*

SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor three printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and one in electronic portable document format (PDF).

2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

B. *Electronic Documents Protocol:* The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol (“EDP” or “Protocol”) for exchange of electronic transmittals.

1. *Basic Requirements*

a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.

c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.

f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. *System Infrastructure for Electronic Document Exchange*

a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.

1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 10 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.

2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.

d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.

g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.

h. The Owner will operate a Project information management system (also referred to in this EDP as "Project Website") for use of Owner, Engineer and Contractor during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph will be mandatory for exchange of Project documents, communications,

submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:

1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;

2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;

3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and

4) Include any other Project Website attributes that may be pertinent to Contractor's use of the facility and pricing of such use.

C. *Software Requirements for Electronic Document Exchange; Limitations*

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.

a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.

2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. *Requests by Contractor for Electronic Documents in Other Formats*

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:

a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for

Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.

d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01 Delete Paragraph 3.01.C in its entirety.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:

1) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":

i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds **0.25"** of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference.

ii) Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: **30** degrees Fahrenheit.

2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by **Calaveras Ranger Station** weather monitoring station at **Avery, CA.**

3) Contractor shall anticipate the number of foreseeable bad weather days per month indicated in the table in Table A—Foreseeable Bad Weather Days. **Work be done between April 15th and November 30th.**

4) In each month, every bad weather day exceeding the number of foreseeable bad weather days established at end of this section in Table A.—Foreseeable Bad Weather Days will be considered as "abnormal weather conditions." The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor's then-current Progress Schedule's critical path for the Project.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 *Subsurface and Physical Conditions*

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of Section 00610, Performance Bond.

2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of Section 00615, Payment Bond.

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be 2 years after Substantial Completion.

2. After Substantial Completion, Contractor shall furnish a warranty bond issued in the form of Section 00612, Warranty Bond. The warranty bond must be in a bond amount of 15 percent of the final Contract Price. The warranty bond period will extend to a date 2 years after Substantial Completion of the Work. Contractor shall deliver the fully executed warranty bond to Owner prior to or with the final application for payment, and in any event no later than 11 months after Substantial Completion.

3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

6.02 *Insurance—General Provisions*

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.H.2 of the General Conditions:

3. For the following Subcontractors, Suppliers, or categories of Subcontractor or Supplier, Contractor shall require the following specified insurance, with policy limits as stated: All Subcontractors to have same insurance limits as Prime Contractor.

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following:

1. Calaveras County Water District
2. County of Calaveras
3. United States Department of Agriculture (USDA)
4. Resident Engineer/Resident Project Representative (as designated by Owner)

E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers'

compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Employer's Liability	
Each accident	$2,000,000
Each employee	$2,000,000
Policy limit	$2,000,000

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.
5. Personal injury coverage.
6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:

1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
2. Any exclusion for water intrusion or water damage.
3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
4. Any exclusion of coverage relating to earth subsidence or movement.
5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
6. Any limitation or exclusion based on the nature of Contractor's work.
7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	**Policy limits of not less than:**
General Aggregate	$2,000,000
Products—Completed Operations Aggregate	$2,000,000
Personal and Advertising Injury	$2,000,000
Bodily Injury and Property Damage—Each Occurrence	$2,000,000

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	**Policy limits of not less than:**
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$2,000,000

K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	$2,000,000
General Aggregate	$2,000,000

L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of $2,000,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be 7:00am – 4:30pm.
2. Owner's legal holidays are New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Martin Luther King Jr. Day, and Christmas Day.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

D. Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

ARTICLE 8—OTHER WORK AT THE SITE

No changes to Supplementary Conditions in this Article.

ARTICLE 9—OWNER'S RESPONSIBILITIES

No changes to Supplementary Conditions in this Article.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.

2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.

3. *Liaison*

   a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

   b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

   c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.

4. *Review of Work; Defective Work*

   a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

   b. Observe whether any Work in place appears to be defective.

   c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

5. *Inspections and Tests*

   a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.

   b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

6. *Payment Requests:* Review Applications for Payment with Contractor.

7. *Completion*

   a. Participate in Engineer's visits regarding Substantial Completion.

   b. Assist in the preparation of a punch list of items to be completed or corrected.

c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.

d. Observe whether items on the final punch list have been completed or corrected.

D. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.

5 Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

No changes to Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No changes to Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of State of California, Department of Transportation (Caltrans) Equipment Rental Rates.

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

a. For purposes of this paragraph, "small tools and hand tools" means any tool or equipment whose current price if it were purchased new at retail would be less than $1,000.

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

   a. the extended price of a particular item of Unit Price Work amounts to five percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and

   b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCCEPTANCE OF DEFECTIVE WORK

No changes to Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01 Add the following new Paragraph 15.01.F:

F. For contracts in which the Contract Price is based on the Cost of Work, if Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that Contractor prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

15.03 *Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to

agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No changes to Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

17.02 *Arbitration*

A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of $100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.

C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.

D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.

E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.

F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the

making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.

G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;

2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;

3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and

4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.

H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

17.03 *Attorneys' Fees*

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02. [Note: If there is no Paragraph 17.02, because neither arbitration nor any other dispute resolution process has been specified here in the Supplementary Conditions, then revise this to state "Add the following new Paragraph immediately after Paragraph 17.01" and revise the numbering accordingly].

17.03 *Attorneys' Fees*

A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18—MISCELLANEOUS

18.08 for *Assignment of Contract*

Table A. Foreseeable Weather Days Per Month

Month	Number of Foreseeable Bad Weather Days in Month Based on Precipitation as Rain Equivalent (inches) (1)	Ambient Outdoor Air Temperature (degrees F) Number of Foreseeable Bad Weather Days in Month Based on Low Temperature (at 11:00 a.m.)
January	5	7
February	5	5
March	5	3
April	5	
May	2	
June		
July		
August		
September		
October		
November	5	5
December	5	7

Notes:

1. Two inches of sleet equal one inch of rain. Five inches of wet, heavy snow equal one inch of rain. Fifteen inches of “dry” powder snow equals one inch of rain.

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SECTION 00810
PROJECT SIGN

For the project duration, the Contractor shall furnish and install at the job site for public view a temporary project sign on ¾" APA rated A-B or A-C grade, exterior plywood panel with design shown below. The District will provide sign design upon contract award, the Contractor shall provide a submittal of the draft/proof for District approval. Before fabricating the sign, the District will have an opportunity to revise and change the exact wording, text and logos. The sign background shall be painted white on both faces with colored logos and text on the smooth (A grade) face. Paints and materials used in fabricating the sign, text and logos shall be weather resistant against fading, cracking, chipping or other abrupt damage by normal rain, snow, sun UV exposure. The sign shall be located as directed by the District. The sign shall be supported and mounted on two 4x4 or 4x6 lumber posts 12-ft in length securely anchored and embedded in the ground. Upon completing the project, the Contractor shall remove the sign and wood posts and restore the ground surface to a good, prior condition. The Contractor will be required to relocate the sign once during Construction as work progresses to new location.

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CALIFORNIA STATE REQUIREMENTS

CA-1.01 Utilities

A. Contractor shall be responsible for marking all excavations and notifying Underground Service Alert (USA) at least 48 hours before digging and follow all other provisions of California Government Code Sections 4216 through 4216.9. Contractor shall maintain an active USA ticket number for the entire duration of the excavation.

B. Unless otherwise indicated in the Contract Documents, all utility lines, conduits, wires, or structures shall be maintained by the Contractor and shall not be disturbed, disconnected, or damaged by him during the progress of the Work, provided, that should the Contractor in the performance of the Work disturb, disconnect, or damage any of the above, all expenses arising from such disturbance or in the replacement or repair thereof shall be borne by the Contractor. However, in accordance with Section 4215 of the California Government Code, the Contractor shall be compensated for all costs of locating and repairing damage to main or trunkline utility facilities located on the work site and for costs of operating equipment on the work site necessarily idled during such work where the Contractor has exercised reasonable care in removing or relocating utility facilities which are inaccurately indicated in the Contract Documents.

CA-1.02. Worker Protection-Excavations

For all excavations in excess of five (5) feet, the Contractor shall, pursuant to Labor Code Section 6705, submit in advance of any excavation hereunder a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from caving ground. No such excavation shall be made until said detailed plan is submitted by Contractor and accepted by Engineer.

CA-1.03 Registration with the California Department of Industrial Relations

This project is a “public works” project as defined in California Labor Code Section 1720 through 1743. In accordance with California Labor Code Article 1725.5, Contractor and all subcontractors are required to be registered with the California Department of Industrial Relations (DIR) in order to bid or be listed on a bid and/or work on a public works project.

CA-1.04 Claims

If this is a “Public Works Contract” as defined in Section 22200 of the California Public Contract Code, claims shall be resolved pursuant to Section 9204 of the California Public Contract Code. Key provisions of that section are summarized as follows:

1. “Claim” means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:
   (A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.
   (B) Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.
2. Payment of an amount that is disputed by the public entity upon receipt of a claim pursuant to this section, Owner shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, Owner and Contractor may, by mutual agreement, extend the time period provided in this subdivision.
3. Contactor shall furnish reasonable documentation to support the claim.
4. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after Owner issues its written statement.
5. If Contractor disputes Owner’s written response, or if Owner fails to respond to a claim, Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, Owner shall schedule a meet and confer conference within 30 days for settlement of the dispute.
6. Within 10 business days following the conclusion of the meet and confer conference , if the claim or any portion of the claim remains in dispute, Owner shall provide Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after Owner issues its written statement, Any undisputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation with the public entity and Contractor sharing the associated costs equally. If the mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.
7. Failure by Owner to respond to a claim from Contractor within the time periods described herein or to otherwise meet the time requirements of this section shall result in the claim being rejected in its entirety. A claim that is denied by reason of the public entity’s failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.
8. Amounts not paid in a timely manner as required by this section shall bear interest at the maximum legal rate.

CA-1.05 Antitrust Claim Settlement

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

CA-1.06 Substitution of Securities

Funding for this project is provided by the United States Department of Agriculture pursuant to the Consolidated Farm and Rural Development Act (7 U.S.C. Section 1921 et seq.) and therefore this contract does not allow for substitution of securities (as described in Public Code Section 22300) in lieu of retention.

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SECTION 00840
FEDERAL (FEMA) AND CAL O.E.S. CONTRACT PROVISIONS

This project is partially funded through FEMA/Cal-OES. This Bid/Award, all subcontracts and other subawards related to performance of work under this agreement are subject to Federal Contract Provisions. In addition to other provisions required by the Federal Agency or non-Federal entity, all contracts under Federal award must comply with the provisions of 2 C.F.R. 200.326, Appendix II to the Uniform Rules. Federal agencies are permitted to require changes, remedies, changed conditions, access and records retention, suspension of work, and other clauses approved by the Office of Federal Procurement Policy.

A. For administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms and provide for such sanctions and penalties as may be appropriate (for contracts more than the simplified acquisition threshold) parties are subject to those provisions of the General Conditions, Section 00700, and applicable supplementary conditions, Section 00800.

B. For termination of this Contract for cause and for convenience by the owner including the manner by which it will be affected and the basis for settlement parties are subject to those provisions of the General Conditions, Section 00700, and applicable supplementary conditions, Section 00800.

C. Contractor is required to comply with Executive Order 11246 of September 24, 1965, entitled "Equal Employment Opportunity" (30 Fed. Reg. 12319, 12935, 3 C.F.R. Part, 1964-1965 Comp., p. 339) as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR chapter 60).

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or

applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agencymay direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States. The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract. The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of

the agency's primary responsibility for securing compliance. The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

D. Contractor is to comply with Davis-Bacon Act, as amended (40 U.S.C. 3141-3148) as supplemented by Department of Labor regulations 29 CFR Part 5. and the Copeland "Anti-Kickback" Act (40 U.S.C. 3145) as supplemented in Department of Labor regulations (29 CFR Part 3).

(1) When required by Federal program legislation, all prime construction contracts in excess of $2,000 awarded by non-Federal entities must comply with the Davis-Bacon Act (40 U.S.C.. 3141-3148) as supplemented by Department of Labor regulations 29 C.F.R. Part 5.

(2) The Contractor shall comply with the Copeland "Anti-Kickback" Act per 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.

(3) The Contractor or subcontractor shall insert in any subcontracts the above clauses and such other clauses as the FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

(4) A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

E. Contractor is required to comply with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by Department of Labor regulations (29 CFR Part 5).

Compliance with the Contract Work Hours and Safety Standards Act:

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph A. of this section, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

(3) Withholding for unpaid wages and liquidated damages. FEMA, Cal-OES shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4). of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

F. Rights to Inventions Made Under a Contract or Agreement, 37 C.F.R. Part 401.

This requirement does not apply to the Hazard Mitigation Grant Program under which this specific project is being funded by FEMA.

G. Contractor is to comply with all applicable standards, orders, or regulations issued under the Clean Air Act (42 U.S.C. §§ 7401-7671q.) or regulations issued pursuant to the Federal Water Pollution Control Act as amended (33 U.S.C. §§ 1251-1387)

(1) The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq. and pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§ 1251 et seq.

(2) Contractor agrees to report each violation to the Calaveras County Water District (CCWD) and understands and agrees that CCWD will, in turn, report each violation as required to assure notification to the Cal-OES, Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.

H. Non-Federal entities and contractors are subject to the debarment and suspension regulations implementing Executive Order 12549, Debarment and Suspension (1986) and Executive Order 12689, Debarment and Suspension (1989) at 2 C.F.R. Part 180 and the Department of Homeland Security's regulations at 2 C.F.R. Part 3000.

(1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

(2) A contract award must not be made to parties listed in the SAM Exclusions. SAM Exclusions is the list maintained by the General Services Administration that contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549. SAM exclusions can be accessed at www.sam.gov. See 2 C.F.R. § 180.530.

(3) The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

(4) This certification is a material representation of fact relied upon by Cal-OES and Calaveras County Water District (CCWD). If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to Cal-OES and CCWD the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

(5) The bidder or proposer agrees to comply with the requirements of2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

I. Contractor is to comply with the Byrd Anti-Lobbying Amendment, 31 § U.S.C. 1352

Contractors who apply or bid for an award of $100,000 or more must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

These certifications are to be made (signed and submitted) in the form of 44 C.F.R. Part 18, Appendix A as shown below.

Bryd Anti-Lobbying Amendment, 31 § U.S.C. 1352

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersign certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making ofanyFederal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C.Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

_____

Signature of Contractor's Authorized Official

_____

Name and Title of Contractor's Authorized Official

_____

Date

J. Procurement of Recovered Materials, 2 C.F.R. § 200.323

A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

(1) In the performance of this contract, the Contractor will make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired either: a) competitively within a timeframe providing for compliance with the contract performance schedule; b) meeting contract performance requirements; or c) at a reasonable price.

(2) Information about this requirement, along with a list of EPA designated items, is available at EPA's Comprehensive Procurement Guidelines web site, https://www.epa.gov/smm/comprehensiveprocurement-guideline-cpg-program.

(3) Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

K. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment, 2 C.F.R. § 200.216

Contractor shall comply with Prohibitions on Certain Telecommunications and Video Surveillance Services or Equipment in conformance with 2 C.F.R. §200.216.

L. Domestic Preferences for Procurements, 2 C.F.R. § 200.322.

(a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.

(b) For purposes of this section:

(1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

M. Access to Records and Retention,

As stipulated in 44 C.F.R. § 13.36(i) (10) – (11), the following access to records and retention requirements apply to this contract and its subcontracts:

a. *The contractor agrees to provide the Calaveras County Water District, Cal-OES, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.*

b. *The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.*

c. *The Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.*

d. *The Contractor will retain these records for three years after final payments and all other pending matters are closed.*

N. Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871)

a. *In accordance with 44 C.F.R. §13.36(i)(13), the Contractor agrees to comply with all mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871)*

b. *The Contractor agrees to including paragraph a. above in each third-party subcontract financed in whole or in part with Federal assistance provided by FEMA.*

SECTION 00900
SPECIAL CONDITIONS

ESC-01, Encroachment Permits
For encroachments on County roads, the Contractor shall obtain permits in accordance with Section 700, Article 7.08, except the District will pay direct governmental charges and inspection fees. In submitting a bid, the Contractor shall fully assess encroachments and traffic control needs and include associated costs in the bid items.

ESC-02, Existing Utilities
The Contractor shall be responsible for marking excavations, calling Underground Service Alert (USA) 48-hrs before digging and following all other provisions of California Government Code Section 4216 through 4216.9. The Contractor shall verify location of all existing utilities and, to the extent necessary to prevent damage by Contractor's work, shall hand dig, pothole and protect existing utilities.

ESC-03, Soil Compaction & Concrete Cylinder Tests
The District performs soil compaction tests and concrete cylinder breaks as part of construction inspection. The Contractor shall notify District's inspector two (2) working days in advance of concrete placements and before backfilling excavations and trenches. The Contractor shall temporarily halt heavy equipment operation to allow personnel safe access to perform tests.

ESC-04, Sanitary Facilities
The Contractor is required to furnish and regularly maintain temporary sanitary facilities, i.e. portable toilets, at the construction site for the duration tank erection.

ESC-05, Construction Water
The District shall designate a source of construction water within one (1) mile of the work site; it will be either reclaimed, raw or distribution water at the District's choice.

ESC-06, Temporary Utilities
The District will not furnish temporary power, telephone or other utilities. Contractor shall provide temporary utilities as needed for construction and his own use. All temporary electrical work by the Contractor shall be adequately grounded, safe for use and installed by a licensed electrician in conformance with the NEC.

ESC-07, Overhead Power Lines
The Contractor is cautioned that PG&E overhead power lines will be present or in progress of being installed to serve the project; the overhead lines will be in close proximity to the Contractor's work and a hazard to keep aware of during construction.

ESC-08, Parking
The Contractor shall park vehicles only in areas designated by the District. The District may change designated parking areas at any time, if parking of Contractor's vehicles is found to interfere with on-going operations or interfere with the public or other agencies.

ESC-09, Site Security and Safety
The Contractor shall secure the project site when not present to eliminate site hazards and maintain public safety. The Contractor shall secure the construction area, work, materials and equipment against theft or vandalism.

ESC-10, Local Speed Limit
There are children and pets at play within residential areas in the vicinity of the project site. The Contractor shall notify his employees and subcontractors that local 25-mph speed limit on residential roads in Big Trees is to be observed and caution used in transporting heavy equipment, hauling materials and driving vehicles through local residential streets.

ESC-11, Preservation of Property
Private and public property – including but not limited to livestock, trees, shrubs, walls, landscaping, paving, roads, driveways, mail boxes, poles, fences, signs, survey markers, monuments, buildings, structures, vehicles, drainages, culverts, conduits and utilities – shall be protected during construction and, if damaged or injured, shall be replaced or restored by Contractor to a condition as good, or better, as when entering upon the work.

ESC-12, Seismic Anchoring
The Contractor shall provide seismic anchoring for equipment as required by applicable building codes.

ESC-13, Stanislaus National Forest, and Sierra Pacific Industries (SPI) Property
The Contractor is made aware that a portion of the project (Big Trees Tank 8) is located on Sierra Pacific Industries Property and is accessed through Stanislaus National Forest Land. The Contractor shall access the Big Trees Tank 8 location using already established access roadways and easements. No construction equipment or materials shall be stored or staged on National Forest Land.

ESC-14, Environmental Compliance (Not Used)

ESC-15, Stormwater Pollution Prevention Compliance
This project is subject to the NPDES general permit for stormwater discharges from construction activities, including the following provisions: State Water Resources Control Board ("SWRCB") Order No. 2009-0009-DWQ (NPDES No. CAS000002), National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (the "NPDES Permit") and amendments 2010-0014 and 2012-0006 require the District to implement a the Storm Water Pollution Prevention Plan for the Project ("SWPPP"). The Contractor is responsible for preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP) for the project and will have day-to-day responsibility for implementing the SWPPP and for ensuring compliance with all of its requirements. The Contractor is referred to the Specifications for more specific requirements including District and Contractor responsibilities.

ESC-16 Dewatering Permit Requirements
The Contractor shall comply with all requirements of California Regional Water Quality Control Board, Central Valley Region Order No.5-00-175 (NPDES No.CAG995001) Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters. This includes dewatering of excavations and discharge of chlorinated water from draining, filling, flushing, testing and disinfecting pipelines and tanks. The Contractor can perform discharges under CCWD's active/current permit, only if this work is performed by Contractor under the direct field supervision by CCWD staff. The Contractor shall dechlorinate all chlorinated/potable prior to discharge to environment and comply will all other permit requirements for dewatering and low threat discharges. A copy of this general order/permit can be readily obtained online.

ESC-17 DIR Registration
Effective March 1, 2015, all contractors and subcontractors shall be registered with California Department of Industrial Relations pursuant to Labor Code Section 1725.5 to be qualified to bid on this project or to be listed as a subcontractor for this project pursuant to Public Contract Code Section 4104. Bidders will be required to submit proof of registration for themselves and all listed subcontractors prior to award of the contract.

WORK CHANGE DIRECTIVE NO.: ____

Owner: Calaveras County Water District
Owner's Project No.: 11095
Engineer:
Engineer's Project No.:
Contractor:
Contractor's Project No.:
Project:
Contract Name:
Date Issued:
Effective Date of Work Change Directive:

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments:

Purpose for the Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

☐ Non-agreement on pricing of proposed change. ☐ Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price: $ _____ **[increase] [decrease] [not yet estimated]**.

Contract Time: _____ days **[increase] [decrease] [not yet estimated]**.

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price ☐ Cost of the Work ☐ Other

	Recommended by Engineer	Authorized by Owner
By:		
Title:		
Date:		

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CHANGE ORDER NO.: _____

Owner: Calaveras County Water District
Engineer:
Contractor:
Project: **Redwood Water Storage Tanks**
Wildfire Hazard Mitigation Project
Contract Name:
Date Issued:

Owner's Project No.: 11095
Engineer's Project No.:
Contractor's Project No.:

Effective Date of Change Order:

The Contract is modified as follows upon execution of this Change Order:

Description: **[Description of the change]**

Attachments: **[List documents related to the change]**

Change in Contract Price	**Change in Contract Times [State Contract Times as either a specific date or a number of days]**
Original Contract Price: $ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. **[Number of previous Change Order]**: $ _____	**[Increase] [Decrease]** from previously approved Change Orders No.1 to No. **[Number of previous Change Order]**: Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: $ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: $ _____	**[Increase] [Decrease]** this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: $ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

	Recommended by Engineer (if required)	Authorized by Owner
By:	_____	_____
Title:	_____	_____
Date:	_____	_____

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SECTION 02000
ENVIRONMENTAL CONDITIONS

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Seismic Conditions
2. Weather Conditions
3. Elevation

1.02 SEISMIC CONDITIONS

A. Approximate Coordinates:

1. Heather Tank (Forest Meadows): Lat: 38.1709, Long: -120.3877
2. Arnold Tank #13 (Meadowmont): Lat: 38.2473, Long:-120.3688
3. Big Trees Tank #4: Lat: 38.3080, Long: -120.2637
4. Big Trees Tank #8: Lat: 38.3247, Long: -120.2532
5. Larkspur Tank (Forest Meadows): Lat: 38.1690, Long: -120.4030

B. Risk Category: IV

C. Assume Site Class C

1.03 WEATHER CONDITIONS

A. Freezing conditions exist during the winter months.

B. 100 degree plus temperatures may exist during the summer months.

C. Ground Snow Load: 144 psf.

1.04 ELEVATION

A. Elevations at the sites are approximately:

1. Heather Tank: 3,700 feet.
2. Arnold Tank 13 (Meadowmont 13) = 4,270 feet
3. Big Trees Tank #4 = 5,285 feet
4. Big Trees Tank #8 = 5,365 feet
5. Larkspur Tank = 3,500 feet

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 02055
DEMOLITION AND SITE PREPARATION

PART 1 – GENERAL

1.01 SUMMARY

A. Demolition and site preparation includes all clearing, grubbing and demolition Work.

1.02 JOB CONDITIONS

A. The Contractor shall determine the actual condition of the site as it affects the Work.

B. In General, the demolition will include:

1. The removal and disposal of redwood tank, associated foundations, appurtenances, and piping. Redwood is to be salvaged by Contractor.
2. Trees and Stumps, removal and disposal.
3. Pavement cutting, removal and disposal.
4. Small precast valve box removal and disposal.
5. Altitude valve vault
6. Electrical conduit removal and disposal.
7. Asbestos Concrete (AC) pipe removal and disposal.
8. Other demolition as required to complete the work.

1.03 QUALITY ASSURANCE

A. General: All work shall be performed in accordance with the local building codes, State Industrial Safety Orders and requirements of the Occupational Safety and Health Act requirements.

B. Schedule: Demolition must be scheduled to allow all existing services and utilities to remain in continuous operation. No interruption in operation will be permitted without previous authorization from the Owner. Contractor shall provide the temporary means and facilities required to keep the utility services in operation when the normal means requires interruption.

C. Protection

1. Demolition shall be performed in such a manner as to not harm adjacent structures, equipment, existing landscaping or natural vegetation.
   a. The Contractor shall assume full responsibility for such disturbance.
   b. All costs of any such repair, rehabilitation, or modifications shall be borne by the Contractor.
   c. Existing facilities not scheduled for demolition, which are damaged by construction activities, shall be repaired or replaced at the District discretion and at the Contractors expense.
2. The Contractor shall provide such protection and means as may be required to transfer material to the ground.
   a. Throwing, dropping or permitting the free fall of material and debris from heights which would cause damage to other work, existing structures, or equipment; undue noise or nuisance; or excessive dust will be expressly prohibited.

D. Protect existing trees and other vegetation to remain against damage.

1. Do not smother trees by stockpiling construction materials or excavated materials within drip line.
2. Avoid foot or vehicular traffic or parking of vehicles within drip line.
3. Provide temporary protection as required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

A. The Contractor shall notify the Owner's Representative when demolition is complete.

3.02 PERFORMANCE

A. Clearing and Grubbing

1. Existing perimeter landscaping shall not be disturbed or removed unless otherwise directed by the District.
2. The site of all open-cut excavations and areas to be cleared shall be cleared and grubbed prior to excavation.
   a. Unless otherwise specified, the Contractor shall remove obstructions such as brush, trees, logs, roots, root balls, heavy sod, vegetation, rock, stones larger than 6 inches in any dimension, broken or old concrete and pavement, debris, and structures.
   b. Clearing and grubbing in areas of structural improvement such as concrete structures shall be cleared and grubbed as above except that obstructions larger than 2 inches in any dimension shall be removed.

B. Equipment, Piping, and Grout Removal

1. All equipment and piping connected to the existing tanks are to be removed and shall be properly disconnected from structures, piping, electrical, and instrumentation systems.
2. The existing Tanks including existing valves and tank appurtenances shall be completely removed.

C. Pavement Removal

1. All pavements and concrete pads shall be saw-cut on a neat line as shown or at right angles to the edge of pavement.

D. Utility Interference

1. Where existing utilities interfere with the prosecution of the work, the Contractor shall relocate the utilities. All work must be coordinated with the utility owner.

3.03 SALVAGE

A. The Contractor is responsible for legal disposal of all materials and equipment including AC pipe.

B. The Contractor shall notify the Owner's Representative five days prior to any demolition work.

3.04 REMOVED MATERIAL AND DEBRIS

A. Where Contractor is directed on the Drawings to "Demolish" or "Remove" material or facilities it is understood that the material will be removed and disposed of offsite unless specifically stated otherwise or directed by the Owner's Representative.

B. All removed material and debris shall become the property of the Contractor and shall be removed from the site.

C. Materials and debris generated by demolition activities shall not be allowed to accumulate. Debris shall be removed daily and disposed of in a manner allowed by law.

3.05 ASBESTOS MATERIALS

A. It is the specific intent of these Contract Documents to exclude from the Work any and all products or materials containing asbestos. No new products containing asbestos shall be incorporated in the Work.

B. The Contractor is made aware that the existing pipelines in the project area include Asbestos Concrete Pipe (ACP). The Contractor shall anticipate the need for removal of sections of the existing ACP during tie-ins and abandonment of the existing ACP where indicated on the plans.

C. All ACP shall be handled and disposed of in accordance with California Code of Regulations (CCR) Title 8, Section 1529.

D. Per CCR Title 8, Section 1529(r) work related to the repair, maintenance, or nondestructive removal of ACP shall only be performed by employees and supervisors trained and certified by a Department of Industrial Relations approved asbestos cement pipe training program.

3.06 BACKFILL

A. Holes or depressions in the ground remaining after demolition of structures, pipelines, or equipment shall be filled with compacted engineered fill materials as specified in Section 02200.

3.07 RESTORATION

A. Restore adjacent structures and facilities damaged during demolition or other construction to original or better condition.

END OF SECTION

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SECTION 02200
STRUCTURE EXCAVATION AND BACKFILL

1.0 GENERAL

1.1 Scope - This section shall govern the work for structure excavation and backfill; refer to Section 02220 for open-cut trenches. Structure excavation shall consist of removing material for construction of foundations, vaults, manholes, and other structures and as otherwise designated on Plans or by Specifications. Structure excavation and backfill shall include furnishing of all materials and equipment, construction or installation of all facilities which may be necessary to perform excavations and place and compact backfill, and the subsequent removal of sheeting, shoring and bracing and other temporary facilities, except where they are required or permitted to remain in place by District.

1.2 Submittals - The following items shall be submitted for District's approval:

1. Lab gradation, durability and sand equivalent of import materials.

2. CAL-OSHA permit for sheeting, shoring, bracing plans.

2.0 MATERIALS

2.1 Excavation is unclassified; Contractor shall make own estimate of soil conditions, extent various materials may occur and complete all excavations regardless of soil conditions. For District projects, no extra payment will be made for changed soil conditions; it is assumed that rock is commonly encountered in Foothills and Contractor's responsibility to include those costs appropriately.

2.2 Backfill materials shall be as follows:

A. Class 2 Aggregate Base meeting material requirements of Section 26 of State Standards for ¾" Maximum Grading, 25 min. sand equivalent, 35 min. durability index, and 78 min R-value; no recycled materials.

B. Select Native Material free of organics, large rocks, debris and deleterious materials with following grading unless otherwise approved by the District:

Sieve Size	% Passing
3"	100
#4	35-100
#200	0-25

C. Crushed rock shall be clean natural material, 1" x No.4 grading conforming to State Standards Section 90 or other acceptable material approved by District.

D. Geotextile Fibric - Mirafi 160N, nonwoven, 160-lbs grab tensile strength per ASTM D4632 and 410-lbs puncture strength per ASTM D6241.

3.0 EXECUTION

3.1 Pavement - Bituminous or concrete pavements, regardless of thickness, and curbs and sidewalks shall be saw cut prior to removal in according to encroachment permit requirements or otherwise as required by the District. Pavement and concrete waste materials shall be removed from the site.

3.2 Excavation - The sides of excavations for structures shall be sufficient to leave at least 1.5 feet clear, as measured from the extreme outside of form work on the structure, as the case may be. Where excavation is inadvertently carried below designated elevations, suitable provision shall be made at the expense of the Contractor for adjustment of construction, as directed by the District, to meet requirements incurred by the deeper excavation. No earth backfill will be permitted to correct overdepth excavation beneath structures, and overdepth excavation in such locations shall be rectified by backfilling with sand, graded gravel, or concrete as directed by the District.

3.3 Bracing – Excavations shall be adequately supported and sheeting, shoring and bracing provided for worker safety as required by CAL-OSHA; safety plans shall meet minimum requirements of CAL-OSHA Construction Safety Orders Sections 1539-1543. Excavations shall be so braced, shored, and supported that they will be safe, such that the walls of the excavation will not slide or settle and all existing improvements of any kind, either on public or private property, will be fully protected from damage. The shoring and bracing shall be arranged so as not to place any stress on portions of the completed work. Contractor shall carefully remove shoring and bracing and timbering to prevent the caving or collapse of the excavation faces being supported.

3.4 Dewatering - Contractor shall not allow water to rise in the excavation or while backfilling the structure, and shall provide and maintain means and devices to continuously remove and dispose of all water entering the excavation during construction and during backfill operations. Water shall be disposed of in a manner that will prevent damage to adjacent property and pipe trenches and in accordance to the approved discharge permit. Contractor shall comply with Waste Discharge Requirements, General Order for Dewatering and other Low Threat Discharges to Surface Waters as issued by the Central Valley Regional Water Quality Control Board.

3.5 Backfill - Filter fabric and crushed stone leveling course shall be placed under structures on undisturbed, firm and dry native subgrade as inspected and approved by the District. Class 2 AB shall be used as backfill around immediate perimeter of structures, adjacent to sidewalls, and within 2-feet of structure; select native material may be suitable outside these limits if not within road or trench sections. After structures and foundations are in place, backfill shall be placed as required for finished grade or otherwise to return to original grade. Backfill shall be placed in horizontal loose lifts not exceeding eight (8) inches in depth and compacted with specified effort. Until reaching 2,500-psi compressive strength, no material shall be deposited against cast-in-place concrete structures.

3.6 Compaction – Backfill material shall be compacted with a level of effort needed to achieve 95% relative compaction per ASTM D1557. Each layer of backfill material shall be moisture conditioned to near optimum moisture content, placed in loose lifts not

exceeding 8-inches in depth, and thoroughly compacted to the specified relative density. District may have a qualified soils technician present to observe and verify placement and compaction methodology is achieving the required placement density. All areas of material placement failing compaction tests shall be removed, material replaced and re-compacted until obtaining the specified relative compaction.

3.7 Excess Excavated Material - Contractor shall remove and dispose of all excess excavated material; all surplus/waste excavated material shall be property of Contractor and disposed of offsite. No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the Contractor; the County typically requires a grading permit for placement of material on private property. The Contractor shall submit a written release signed by all property owners with whom Contractor has entered into agreements for disposal of excess excavated material, absolving the District from any liability connected therewith.

3.8 Restoration of Damaged Surfaces and Property - Any existing improvements, facilities, vegetation, fences, roads, sidewalks, gutters, or other improvements not designated to be demolished that have been removed, damaged, or disturbed by the Contractor's activities, for whatever reason, shall be replaced or repaired at the expense of the Contractor and to the satisfaction of the property Owner and/or District.

3.9 Final Clean-up – Unless other specific surface improvements are shown on the plans or specified, the right-of-way shall be thoroughly cleaned and restored to pre-construction condition or better and left in a neat and presentable condition according to encroachment permit requirements and satisfaction of the Owner's representative and/or the District.

END OF SECTION

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SECTION 02220
TRENCH EXCAVATION, BACKFILL AND COMPACTION

1.0 GENERAL

1.1 Scope - This section governs the work for trench excavation, backfill and compaction for underground pipeline work.

1.2 Submittals - Upon request, submit the following items for District approval:

A. Lab tests for backfill gradation, durability and sand equivalent.

B. CAL-OSHA permit for sheeting, shoring and bracing plans.

1.3 Testing - Testing frequency and location shall be approved by District.

2.0 MATERIALS

2.1 Excavation is unclassified; Contractor shall make own estimate of soil conditions, extent various materials may occur and complete all excavations regardless of soil conditions. For District projects, no extra payment will be made for changed soil conditions; it is assumed that rock is commonly encountered in Foothills and Contractor's responsibility to include those costs appropriately.

2.2 Pipe Zone Backfill - Limits of pipe zone backfill are designated on CCWD Standard Detail G05 and shall consist of the following material:

A. Class 2 Aggregate Base meeting material requirements of Section 26 of the State Standards with 3/4" Maximum Grading, 25 min. sand equivalent, 35 min. durability index, and 78 min. R-value; no recycled materials.

2.3 Initial & Final Backfill – Initial and final backfill limits are designated on CCWD Standard Detail G05; initial and final backfill shall be as follows:

A. Road Sections – Class 2 A.B. as defined above.

B. Non-Roadway – Select native or imported material free from organics, large rocks, debris and deleterious substances with following gradation:

Sieve Size	% Passing
3"	100
#4	35-100
#200	0-25

2.4 Slurry Backfill – Cement slurry shall consist of two sacks of Portland cement per yard of sand with enough water for workability. The District shall approve all uses of slurry backfill.

2.5 Warning Tape – 3" wide warning tape marked as follows:
Water, Colored Blue marked "CAUTION / WATER LINE BURIED BELOW"
Sewer, Colored Green marked "CAUTION / SEWER LINE BURIED BELOW"

2.6 Tracer Wire – Tracer wire shall be #12 AWG, Type UF with 3M Direct Bury (DBR) Splice Kit or equal.

3.0 EXECUTION

3.1 Excavation - Excavation for pipelines, fittings and appurtenances shall be open trench to the depth and in direction necessary for the proper installation as shown on the contract drawings or as otherwise approved by District. Excavation shall only proceed when the necessary materials have been delivered to the site.

The Contractor shall remove obstructions within the trench area or adjacent thereto, such as abandoned concrete structures, logs, and debris of all types, without additional compensation. The District may, if requested, make changes in the trench alignment to avoid major obstructions. The Contractor shall bear all costs of disposing of roots and all other waste materials from the excavation. Material shall be disposed of offsite at Contractor's expense.

Contractor shall be responsible for marking all excavations and notifying Underground Service Alert (USA) North at least 48-hours before digging, and follow all other provisions of California Government Code Section 4216 through 4216.9. Contractor shall maintain an active USA North ticket number for the entire duration of the excavation.

A. Existing Pavement Removal - Pavement shall be removed and replaced in manner prescribed by the Agency issuing the encroachment permit. Existing pavement, curbs, gutters, sidewalks and driveways to be removed shall be neatly saw cut prior to removal. Saw cuts shall have a minimum depth of 1-inch in concrete sidewalk. Concrete sidewalks or driveways shall be removed so that a minimum of a 30-inch square is replaced. If the saw cut in a sidewalk or driveway would fall within 30 inches of a construction joint, expansion joint, or edge, the concrete shall be removed and replaced to the joint or edge. If the saw cut would fall within 12 inches of a score mark, the concrete shall be removed and replaced to the score mark. Concrete shall be removed by jackhammer.

B. Grading and Stockpiling - The Contractor shall control grading in a manner to prevent water running into excavations. Obstructions of surface drainage shall be avoided and means shall be provided whereby storm and wastewater can be uninterrupted in existing gutters, other surface drains, or temporary drains. Material for backfill or for protection of excavation in public roads from surface drainage shall be neatly placed and kept shaped so as to cause the least possible interference with public travel. Free access must be provided to all fire hydrants, water valves, meters, and private drives.

C. Line & Grade - Contractor shall excavate trench to line and grade shown on plans; any deviations shall first be approved by the District. The trench shall be

excavated to minimum depth of 6 inches below the bottom of the pipe with trench sidewalls maintained nearly vertical as is practical.

D. Trench Support – Trenches and excavations shall be adequately supported and sheeting, shoring and bracing provided for worker safety as required by CAL/OSHA; safety plan shall meet minimum requirements of CAL/OSHA Construction Safety Orders Sections 1539-1543.

The Contractor shall be responsible for adequately shored and braced excavations so that the earth will not slide, move, or settle, and so that all existing improvements of any kind will be fully protected from damage.

No shoring, once installed, shall be removed until the trench has been approved for backfill operations. Removal of shoring shall only be accomplished during backfill operations and in a manner as to prevent any movement of the ground or damage to pipe or other structures.

Contractor shall obtain all permits for any excavations over five (5) feet in depth into which a person is required to descend or any excavation less than five (5) feet in depth in soils where hazardous ground movement may be expected and into which a person is required to descend.

Excavated material shall not be placed closer than two (2) feet from the top edge of the trench. Heavy equipment should not be used or placed near the sides of the trench unless the trench is adequately braced.

E. Blasting - Blasting for excavation shall not be permitted without the written approval of the District and only after securing the required permits. Procedures and methods for blasting shall conform to all Federal, State, and local laws and ordinances. The Contractor shall notify the proper representatives of jurisdictional agencies and individuals which may have property within at least 600 feet of the construction zone or within an area in which damage could occur, at least 24 hours in advance.

Blasting mats shall be used at all times where flying rock might cause damage to any person, building, power line, or other installation.

All traffic shall be stopped from entering the blasting area and all persons evacuated/removed a safe distance from the area prior to blasting.

The Contractor shall designate, in writing, a single responsible individual as the Powder Foreman. Carelessness or incompetency by the Powder Foreman shall be grounds for immediate removal from said position or responsibility, and the Powder Foreman shall not be permitted to handle or use explosives on the remainder of the project. Priming of all explosives shall be with electric detonators of sufficient size to ensure efficient and complete detonation of the explosive charge. All charges consisting of more than one hole shall be wired either as series or series-parallel. Straight parallel hookups will not be permitted.

The Contractor is responsible to provide a power source adequate for detonation of the explosive charges consistent with the accepted standard practices involving electric detonation of explosives. Excessive blasting will not be permitted, and any material outside the authorized cross section which may be loosened or shattered by blasting shall be removed.

The District Engineer shall have authority to require the Contractor to discontinue any method of blasting which leads to overshooting, is dangerous to the public, or is destructive to property or natural features.

The Contractor shall notify the District a minimum of one (1) week in advance of any blasting operations.

F. Preservation of Trees - Excavation within the dripline of any tree shall conform to the project's environmental monitoring program and to encroachment permits. Trees shall not be removed outside of fill or excavated areas, except as authorized by the District.

G. Dewatering - Contractor shall provide and maintain means and devices to continuously remove and dispose of all water entering excavations during construction and not let water rise in the excavation until work is completed and backfilled. Water shall be disposed of in a manner that avoids damage to adjacent pipe trenches and property. Contractor shall comply with all Federal and State laws and regulations governing disposal of water from construction dewatering operations. Contractor shall comply with Waste Discharge Requirements, General Order for Dewatering and other Low Threat Discharges to Surface Waters as issued by the Central Valley Regional Water Quality Control Board.

H. Overexcavation - Any overexcavation carried below the grade or beyond the trench width, as specified or shown, shall be rectified by backfilling with approved sand and/or graded gravel and shall be compacted as directed by the District.

I. Structure Protection - Temporary support, adequate protection, and maintenance of all underground and surface structures, drains, sewers, and other utilities encountered in progress of work shall be furnished by Contractor at its expense and subject to District's approval. Any structure or utility that has been disturbed shall be restored upon completion work.

J. Protection of Property/Structures - Trees, shrubbery, fences, poles, and all other property and structures shall be protected unless their removal is shown on the drawings or authorized by the District Engineer.

K. Trench Width - The width of the trench within the pipe zone shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed the amount shown in the standard details. In general, the following shall be adhered to:

Nominal Pipe	Trench Width

Diameter	Minimum	Maximum
Dia. < 10”	OD + 12”	OD + 18”
Dia. ≥ 10”	OD + 18”	OD + 24”

Trench widths at joint bells and fittings shall be increased from the outside diameter to obtain at least minimum width stated above; widths in excess of those tabulated above must have prior written approval by the District.

L. Maximum Length of Open Trench - Unless otherwise specified or directed by District, the maximum length of open trench shall be 500 feet or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. The distance is the collective length of any location, including open excavation, pipe laying, and appurtenant construction and backfill that has not been temporarily resurfaced. Trenches should be closed by the end of each day; the Contractor shall provide proper barricades and H20 traffic rated, skid resistant plates in any areas remaining open. Failure by the Contractor to comply with the limitations specified herein may result in an order to halt progress of the work until compliance has been achieved.

No open trench will be allowed from November to April unless conditions permit, e.g. no rain/snow and relatively dry soils, for extended period and Contractor implements and maintains effective stormwater pollution prevention, erosion controls and other best management practices.

3.2 Trench Foundation - The trench bottom shall be graded to provide a smooth, firm, and stable foundation at every point throughout the length of the pipe. Should large gravel and cobbles be encountered at the trench bottom or pipe subgrade, they shall be removed from beneath the pipe and replaced with a uniform layer of pipe zone material which shall be compacted to provide uniform support and a firm foundation.

A. Foundations in Poor Soil - If excessively wet, soft, spongy, unstable, or similarly unsuitable material is encountered at the surface upon which the bedding material is to be placed, the unsuitable material shall be removed to a depth as determined in the field by the District. The trench bottom shall be stabilized as detailed by the Standard Drawings as directed by the District. The Contractor's attention is called to Section 3.1G regarding its responsibilities in maintaining adequate dewatering procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water.

3.3 Backfill and Compaction – Complete work within shortest possible time along main roads and other roads subject to regular traffic. If for any reason construction of the pipeline or appurtenances thereto is delayed, the District may require that the trench be backfilled and such areas or streets opened to traffic.

A. Pipe Zone - After completion of the trench excavation and proper preparation of the foundation, 6 inches of bedding material shall be placed on the trench bottom for support under the pipe. Bell holes shall be dug to provide adequate clearance between the pipe bell and the bedding material. All pipes shall be installed in such a manner as to ensure full support of the pipe barrel over its entire length. After the pipe is adjusted for line and grade and the joint is made,

the remainder of pipe bedding shall be placed to the limits as shown on the Drawings.

All bedding material shall be compacted 95% relative compaction. The bedding and backfill shall be brought to optimum moisture content and placed by hand in layers not exceeding 3 inches in thickness to the centerline (springline) of the pipe. Each layer shall be solidly tamped with the proper tools so as not to injure, damage, or disturb the pipe.

Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe. Each lift shall be "walked in" and supplemented by slicing with a shovel to ensure that all voids around the pipe have been completely filled. Mechanical compaction such as "pogo sticks" or "wackers," as approved, shall be used for pipe zone compaction.

B. Initial Backfill - The remaining portion of the trench shall be backfilled, compacted, and/or consolidated by approved methods to obtain the relative compaction shown on the Standard Drawings.

When backfill is placed mechanically, the material shall be pushed onto the slope of the material previously placed and allowed to slide down into the trench. Contractor shall not push backfill into the trench in such a way as to permit free fall of the material until at least 18 inches of cover is provided over the top of the pipe. Under no circumstances shall sharp, heavy pieces of materials be allowed to be dropped directly onto the pipe or the tamped material around the pipe. Backfill shall be placed in loose lifts not exceeding 8 inches and compacted by an approved method.

Heavy-duty compacting equipment having an overall weight in excess of 125 pounds shall not be used until backfill has been completed to a depth of 2 feet over top of the pipe. If hydro-hammer is used for compaction of overlying materials, at least 4 feet of backfill must be placed over top of the pipe prior use; this is to ensure that the pipe is not damaged.

C. Final Backfill - Final backfill placed in trenches below roadways or below shoulders of roadways shall be compacted to obtain the relative compaction shown on the Standard Drawings. Backfill shall be placed in loose lifts not exceeding 8 inches, compacted, and brought up to the subgrade of the roadway.

D. Excess Excavated Material - Contractor shall make arrangements for and remove and dispose of all excess excavated material. All surplus material shall become the property of Contractor and disposed of offsite. No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the Contractor. Before the District will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom it has entered into agreements for disposal of excess excavated material, absolving the District from any liability connected therewith.

3.4 Restoration of Damaged Surfaces and Property - If any existing improvements, facilities, or vegetation not designated to be removed have been damaged, removed, or disturbed by the Contractor, for whatever reason, such improvements, facilities, and vegetation shall be replaced or repaired at the expense of the Contractor.

3.5 Final Clean-Up - The right-of-way shall be restored to pre-construction condition or better and left in a neat and presentable condition to satisfaction of the District and terms and conditions of the encroachment permit.

END OF SECTION

SECTION 02270
SOIL AND EROSION CONTROL

PART 1 – GENERAL

1.01 SUMMARY

Section Includes:

1. Soil erosion and sediment control and Storm Water Pollution Prevention Plan (SWPPP) preparation and implementation.
2. Dewatering permit requirements.

1.02 QUALITY ASSURANCE

Referenced Standards:

1. Erosion control standards: Standards and Specifications by the California Stormwater Quality Association (CASQA) and the California Department of Transportation (CalTrans).

PART 2 – PRODUCTS

2.01 MATERIALS

Water Quality Measures:

1. Erosion control measures, such as silt fences, filter fabric, sedimentation ponds, placement of hay bales along the peripheries of construction sites, temporary detention ponds, and terraced slopes, shall be employed as appropriate in conformance with the Contractor prepared and District approved Storm Water Pollution Prevention Plan (SWPPP) and shall be in place prior to any clearing or grading activity.

PART 3 – EXECUTION

3.01 GENERAL

The 1972 amendments to the Federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point sources. The 1987 amendments to the Clean Water Act (CWA) created a new section of the CWA devoted to storm water permitting (Section 402(p)). The EPA has delegated permitting authority to the State Water Resources Control Board (SWRCB). The SWRCB issues both general and individual permits. Construction activities are regulated under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) provided the total amount of ground disturbance during construction is greater than or equal to 1 (one) acre. The appropriate Regional Water Quality Control Board (RWQCB) enforces the General Permit. Coverage under a General Permit requires the submission of a Notice of Intent (NOI) with the appropriate fee, annual compliance reports, a Notice of Termination (NOT) and preparation of a

storm water pollution prevention plan (SWPPP).

Construction activity includes, but is not limited to: clearing, grading, demolition, excavation, construction of new structures, pipelines and reconstruction of existing facilities involving removal and replacement that results in soil disturbance. This includes construction access roads, staging areas, storage areas, stockpiles, and any off-site areas which receive run-off from the construction project such as discharge points into a receiving water.

If a violation of the permit is due to the Contractor's actions or inactions and a fine is assessed, the Contractor shall be responsible for the fine.

A SWPPP has not been prepared for the project. The Contractor is responsible for preparing and implementing a SWPPP for the project.

3.02 PROJECT RISK LEVEL

This project has been determined by the Owner, to be a Risk Level 2. The Contractor shall adhere to and implement the requirements of a Risk Level 2 project as outlined in the General Permit.

3.03 GENERAL ROLES AND RESPONSIBILITIES

Legally Responsible Person (LRP): The Owner shall act as the project's LRP.

Qualified SWPPP Developer (QSD): The Contractor shall furnish the QSD. The QSD for this project shall prepare the SWPPP document. The QSD is responsible for construction support in relation to the implementation and possible modification of the SWPPP. The QSD shall coordinate with the Owner for information required to submit the NOI and all other information required for the SMARTS system.

1. Within seven (7) days after receipt of the Notice of Award from the Owner, the Contractor shall submit the QSD's qualifications for review by the Owner.

Qualified SWPPP Practitioner (QSP): The Contractor shall furnish the QSP and make them responsible for the day to day implementation of the SWPPP. The QSP shall be qualified through the SWRCB or through an SQRCB approved training course. The QSP can train appropriate staff and/or subcontractors; however, the SWRCB inspectors may ask to meet and/or conduct an inspection with the QSP responsible for a particular project/site. The QSP is responsible for the implementation of BMPs on the site of the Work, not the trained superintendents or staff. The QSP shall be available by phone seven days a week, 24 hours a day, and must be able to present at the Work site within two hours of notification. When the QSP is not able to be on the site of the Work as prescribed herein, the QSP shall designate in writing to the Owner a trained responsible party which must be on the site of the Work when construction activities are actively taking place.

2. The QSP shall take direction from the QSD regarding any SWPPP modifications. Modifications shall be communicated to the QSP by the Owner.

3. The QSP shall be given access by the Owner to the SWRCB's Storm Water Multiple Application and Report Tracking System (SMARTS) for uploading and reporting requirements.

4. Within seven (7) days after receipt of the Notice of Award from the Owner, the Contractor shall submit the QSP's qualifications for review by the Owner.

3.04 CONTRACTOR'S RESPONSIBILITIES

The Contractor shall prepare a SWPPP for the project and provide for the District's review and approval within ten (10) days of receiving the Notice to Proceed.

The Contractor shall comply with the SWRCB, RWQCB, County, and other local agency requirements regarding stormwater management, inspection, and monitoring.

The Contractor shall be responsible for meeting the requirements of the General Permit except as specifically noted below. The Contractor shall prepare the following in accordance with the General Permit:

1. Install, construct, implement, monitor, maintain and remove upon completion all of the BMPs and other pollution prevention measures in accordance with the STORM WATER POLLUTION PREVENTION PLAN and the project risk level requirements.
2. Daily visual inspections, photographs, and documentation of project site and BMPs.
3. Pre- and post-rain inspections, photographs, and documentation of project site and BMPs. Preparation of pre- and post-rain reports and uploading to SMARTS.
4. Preparation of quarterly inspections and reports and uploading to SMARTS.
5. Preparation of annual inspections and reports and uploading to SMARTS.
6. Sampling, monitoring, and reporting of stormwater discharge and receiving water as required by the SWPPP and project risk level requirements. Uploading to SMARTS.
7. Non-compliance reporting of numeric exceedance levels and uploading to SMARTS.
8. Preparation of NOT and uploading to SMARTS.

The Contractor shall notify to Construction Manager upon completion and uploading to SMARTS of all reports. These documents are subject to review and comment by the Owner.

Contractor shall be bound to the conditions on the Notice of Intent (NOI) that will be filed by Owner and will be responsible for all costs associated with the implementation of the Plan including all fines, damages and job delays incurred due to failure to implement the requirements of the Permit.

Contractor shall maintain a copy of the NOI, Plan and Permit at the Project Site at all times, and shall make the Plan available to Owner, Construction Manager, and the State Water Quality Control Board during construction activities. Contractor shall allow authorized agents of the Water Quality Control Board, State Water Resources Control Board, U.S. Environmental Protection Agency, and local storm water management personnel upon the presentation of credentials and other documents as may be required by Laws and Regulations to accomplish the following.

9. Enter, at reasonable times, upon the construction site and Contractor's facilities pertinent to the Work.
10. Have access to and copy, at reasonable times, any records that must be kept as

specified in the permit.

11. Inspect, at reasonable times, the construction site and related erosion and sediment control measures.
12. Sample or monitor, at reasonable times, for the purpose of ensuring compliance with the Permit.
13. Contractor shall notify the Construction Manager immediately following a request from any regulatory agency to enter, inspect, sample, monitor or otherwise access the Project Site or its records.

The Contractor shall be responsible for taking the proper actions to prevent stormwater coming into contact with contaminants and sediments from migrating offsite or entering storm sewer drainage systems. The Contractor shall take immediate action if directed by the Construction Manager or if the Contractor observes contaminants and/or sediments entering the storm drainage system, to prevent further stormwater from entering the system.

3.05 OWNER RESPONSIBILITIES

The Owner shall be responsible for the following:

Prepare and file the Notice of Intent (NOI) using the Contractor prepared SWPPP.

PART 4 – DEWATERING

Construction dewatering in Calaveras County is regulated by the California Regional Water Quality Control Board- Central Valley Region. In June of 2000, the Central Valley Region adopted Waste Discharge Requirements Order No. 5-00-175 and National Pollutant Discharge Elimination System (NPDES) Permit No. CAG995001 to regulate construction dewatering. Should the Contractor need to control groundwater by dewatering and/or depressurization of water bearing soil and rock formations, the Contractor must comply with this NPDES Permit, or any updated NPDES Permit, and all other laws and regulations having jurisdiction over construction dewatering. The Contractor is responsible for obtaining all permits from agencies with control over all dewatering matters including well installation/abandonment, water discharge, use of existing storm drains and natural water sources. Contractor can download a complete copy of Order No. 5-00-175 on the internet site:

http://waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/5-00-175.pdf

The Contractor will be held responsible for any fines or penalties from regulatory agencies resulting from its dewatering system.

Before dewatering is commenced, the Contractor shall obtain acceptance of the Construction Manager for the method, installation, monitoring, testing, removal, discharge point(s) and other system details of the Contractor's proposed dewatering system. To that end, the Contractor is to submit to the Construction Manager a complete dewatering plan prepared and signed by a Professional Engineer registered in California.

END OF SECTION

SECTION 02500
ASPHALT CONCRETE PAVING

1.0 GENERAL

1.1 Summary: This Section provides specifications for asphalt concrete pavement. The Contractor is required to saw-cut and remove all existing paving as needed for excavation and trenching as indicated on the Drawings. The Contractor is to reapply all pavement traffic markings including center lines, road limit markings, and stop lines damaged during construction.

1.2 Submittals: Provide the following submittal accordance in with Section 00700-7.16 and Section 00800-SC-7.20.

A. Information Submittals

1. Asphalt Concrete Mix Formula:
   a. Submit minimum of 15 days prior to start of production.

2. Test Report for Asphalt Cement:
   a. Submit minimum 10 days prior to start of production.
   b. Show appropriate test method(s) for each material and the test results.

3. Statement of qualification for independent testing laboratory.

4. Test Results:
   a. Mix design.
   b. Asphalt concrete core.
   c. Gradation and asphalt content of uncompacted mix.

1.3 Quality Assurance: Asphalt concrete mix formula shall be prepared by approved certified independent laboratory under the supervision of a certified asphalt technician. Laboratory testing shall be in accordance with ASTM E329.

1.4 Environmental Requirements: Do not apply asphalt materials or place asphalt mixes when ground temperature is lower than 10 degrees C (50 degrees F) or air temperature is lower than 4 degrees C (40 degrees F). Measure ground and air temperature in shaded areas away from heat sources or wet surfaces. Do not apply asphalt materials or place asphalt mixes when application surface is wet.

2.0 PRODUCTS

2.1 Materials

A. Road repair shall conform to road agency permit conditions and specifications. When the County encroachment permit conditions are more restrictive, they will take precedence.

B. Asphalt Material (Aggregate Concrete): Conform to the following specification: Asphalt Material shall be a hot mix asphalt concrete, consisting of a mixture of mineral aggregate and paving asphalt conforming to Section 92 of the Caltrans Standard Specifications, PG 64-16.

C. Traffic Stripping and Marking: Provide white thermoplastic paint per Caltrans Standard Specification Section 84.

3.0 EXECUTION

3.1 General

A. Traffic Control:
1. In accordance with all applicable specification sections and laws.
2. Minimize inconvenience to traffic, but keep vehicles off freshly treated or paved surfaces to avoid pickup and tracking of asphalt.

B. Driveways: Repave driveways from which pavement was removed. Leave driveways in as good or better condition than before start of construction.

3.2 Line and Grade: Provide and maintain intermediate control of line and grade, independent of underlying base, to meet finish surface grades and minimum thickness. Construct shoulders to line, grade, and cross section shown.

3.3 Preparation: Prepare subgrade as specified.

B. Thoroughly coat edges of contact surfaces with emulsified asphalt or asphalt cement prior to laying new pavement. Prevent staining of adjacent surfaces.

3.4 Pavement Application

A. General: Place asphalt concrete mixture on approved, prepared base in conformance with this section.

B. Pavement Mix:

1. Prior to Paving:
   a. Sweep primed surface free of dirt, dust, or other foreign matter.
   b. Patch holes in primed surface with asphalt concrete pavement mix.

2. Place asphalt concrete pavement mix in one single lift.

3.. After placement of pavement, seal meet line by painting a minimum of 150 millimeters (6 inches) on each side of joint with cut back or emulsified asphalt. Cover immediately with sand.

C. Compaction: Roll until roller marks are eliminated and density of 92 percent of measured maximum density determined in accordance with ASTM D2041.

D. Tolerances:

1. General: Conduct measurements for conformity with crown and grade immediately after initial compression. Correct variations immediately by removal or addition of materials and by continuous rolling.

2. Completed Surface or Wearing Layer Smoothness:
   a. Uniform texture, smooth, and uniform to crown and grade.
   b. Maximum Deviation: 1/8 inch from lower edge of a 3.6 meter (12 foot) straightedge, measured continuously parallel and at right angle to centerline.
   c. If surface of completed pavement deviates by more than twice specified tolerances, remove and replace wearing surface.

3. Transverse Slope Maximum Deviation: 1/4 inch.

END OF SECTION

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SECTION 02615
DUCTILE IRON PIPE AND FITTINGS

1.0 GENERAL

1.1 Scope - This specification governs the furnishing and installation of ductile iron pipe and fittings including laying, joining, bedding, and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be accomplished in strict accordance with the drawings and other terms and conditions of the contract. Pipe and fittings shall comply with latest published version of ANSI/AWWA standards.

All material and products used in a drinking water system that may come in contact with drinking water shall be certified as meeting the specifications of the latest published edition of ANSI/NSF-61.

Fitting types covered under this section include bends, tees, crosses, reducers, couplings, caps, plugs, adapters, and all other fittings necessary for a complete pipeline installation.

The Contractor shall also furnish all equipment, tools, labor, and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified.

All standard specifications, i.e., ANSI/AWWA, ASTM, etc., made a portion of these specifications by reference shall be the latest published edition/revision thereof.

The Contractor shall be responsible for all material furnished by it, and shall replace at its own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.

The Contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall be kept tree from dirt and foreign matter at all times.

Pipe surfaces shall be free from nicks, scratches, and other blemishes. The joining surfaces of pipe spigots and bell sockets shall be free from gouges or other imperfections that might cause leakage.

1.2 References Standards:

A. AWWA C104, Cement Mortar Lining for Ductile Iron Pipe and Fittings

B. AWWA C105, Polyethylene Encasement for Ductile Iron Pipe Systems

C. AWWA C110, Ductile Iron and Gray Iron Fittings

D. AWWA C111, Rubber Gasket Joints for Ductile Iron Pipe and Fittings

E. AWWA C115, Flanged Ductile Iron Pipe with Threaded Flanges

F. AWWA C116, Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile Iron and Gray Iron Fittings

G. AWWA C150, Thickness Design of Ductile-Iron Pipe

H. AWWA C151, Ductile Iron Pipe, Centrifugally Cast

I. AWWA C153, Ductile Iron Compact Fittings

J. AWWA C219, Bolted, Sleeve-Type Couplings for Plain End Pipe

K. AWWA C600, Installation of Ductile-Iron Water Mains and Their Appurtenances

L. ANSI/NSF-61, Drinking Water System Components – Health Effects

2.0 MATERIALS

2.1 Ductile Iron Pipe (DIP) and Fittings: All materials shall conform to NSF-61 and the following requirements:

A. Ductile Iron Pipe shall conform to AWWA C150 and C151 Pressure Class 350 and AWWA C115 flanged pipe Special Thickness Class 53. Standard lay lengths shall be eighteen (18) or twenty (20) feet; provide custom lengths for flanged pipe spools.

B. Fittings shall be all ductile iron (no gray iron) conforming to AWWA C110 and/or C153.

C. Lining and Coating shall be AWWA C104 cement mortar lining with standard 1 mil thick asphaltic outside coating; provide fusion bonded epoxy fittings only as specifically noted on plans or contract documents.

D. Joints shall conform to AWWA C111 for standard flanged, mechanical, push-on (Tyton), TR-Flex, Flex-Ring or approved equal.

E. Restraint Glands & Flange Adapters shall conform to AWWA C111, rated 250-psi working pressure and consist of ASTM A536 ductile iron body incorporating multiple individually actuated gripping wedges engaged by torque limiting twist off nuts. Restrained joints shall allow at least 3-degrees of deflection during assembly. Casting body shall have heat cured polyester powder coating and wedges two coats thermoset epoxy. All products to be domestic sourced; restraint flange adapters EBAA 2100 Megaflange; mechanical joint restraint glands EBAA 1100 Megalug, Romac Roma-Grip (Romabond) or equal.

F. Bolts & Nuts conforming to AWWA C111; flanged heavy hex nuts and bolts of low-carbon steel ASTM A307/Grade B, 60,000 psi tensile strength; t-bolts and nuts of high strength, low alloy corrosion resistant steel (ASTM A242) with 45,000-psi yield strength. All bolts, nuts & washers zinc plated with Xylan 1424 top coat (Tripac 2000, Romac R-Blue or equal).

G. Non-Restrained Couplings & Flange Adapters: Flanged coupling adapters, straight and transition couplings shall conform to AWWA C219, NSF-61 compliant, rated 250-psig working pressure, fusion bonded epoxy lined/coated ductile iron sleeve and end rings, 304 stainless steel bolts and nuts; Romac 501/XR501/FCA501, Smith-Blair 441/461/912, or equal.

2.2 Polyethylene Encasement shall be conform to AWWA C105, Method A.

3.0 EXECUTION

3.1 Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions. Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used. Pipe and fittings shall not be stored on rocks or gravel or other hard material that might damage the pipe.

A. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well-ventilated place and not exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

3.2 Pipe Laying - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, District Standards Drawings, and ANSI/AWWA C600, as complimented and modified herein.

A. Cleanliness - Interior of pipes shall be clean of foreign materials before sections of pipe are installed and protected to prevent entry of foreign materials after installation. Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress. Ground water shall not be allowed to enter the pipe.

B. Inspection before Installation - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside

for inspection by the District, which will accept proposed corrective repairs or rejection.

C. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench. If damage occurs to any pipe, fittings, valves, hydrants, or water main accessories in handling, damage shall be immediately brought to the District's attention.

D. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans. Generally, the pipe is laid with the bell end facing the direction of pipe laying, except on steep grades.

Every precaution shall be taken to prevent foreign material from entering the pipe while being placed in the trench. If the pipe-laying crew cannot install the pipe into the trench without getting earth into it, the District may require a heavy, tightly woven canvas bag of suitable size, or plastic caps, be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing, or other material shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.

Joints shall be assembled in accordance with manufacturer's instructions. Each joint checked with a feeler gauge to assure proper seating of gasket.

E. Cutting of Pipe – Pipe that has been marked For Field Cut shall be used. If not marked for field cutting, then the diameter of the pipe should be checked prior to cutting. Field cuts and connections shall be in accordance with AWWA or manufacturer's published instructions. The cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without damage so as to leave a smooth, finished end at right angles to the axis of the pipe.

F. Allowable Deflection - The maximum allowable angular deflection at joints shall be 75% of manufacturer's published maximum value unless otherwise allowed by District.

G. Unless otherwise approved by the Engineer, piping and fittings that are out of alignment or not plumb shall not be forced by jacking, polling, other mechanical means to correct the misalignment. Flexible connectors/adaptors shall be

provided at each end, such as EBAA Mega-Flange or equal, to provide flexibility in piping system to correct the misalignment.

3.3 Thrust Restraint – Fittings, valves, and pipe joints shall be restrained against unbalanced thrust forces from internal pipeline pressure acting on pipe and surrounding soil. Unbalanced thrust forces occur at bends, tees, wyes, closed valves, dead ends and reducers, but these forces are transmitted along the pipeline to the pipe joints. At high pressures and larger pipe diameters, the size of the thrust block becomes so large that it becomes impracticable in comparison to mechanical methods. Unless plans and/or specifications require entire pipeline to be fully restrained, thrust restraint can be provided by either: A) mechanical means, B) thrust blocks or C) a combination of these two methods.

A. Mechanical Thrust Restraint – For all diameters buried condition, U.S. Pipe TR-Flex, American Flex Ring or equal; or alternatively for buried 8" diameter or smaller, push-on (Tyton) joint pipe with restraint gaskets (U.S. Pipe Field Lok 350, Romac Piranha or equal) and mechanical joint fittings with restraint glands. For all flanged valves, pipe and fittings, provide flanged spools, restrained flange adaptors and other restraint devices as shown/noted on the plans and approved by the District.

B. Thrust Blocks – Concrete thrust blocks shall only be used for piping systems 12-inch and smaller with test pressures not exceeding 150-psig. Thrust blocks shall be poured against undisturbed earth and have at least the minimum dimensions shown per Detail W01 of the Standard Drawings. Care shall be taken not to obstruct the outlets of tees or crosses, which are intended for future connections. A waterproof paper or plastic bond-breaker shall be placed between plugs and caps and the concrete thrust block to facilitate their removal in the future.

C. Combined Method – Mechanical thrust restraint combined with thrust blocking is required at all buried tie-in connections made between new and existing piping and in situations when thrust restraint of existing piping is unknown condition. Also, depending on the pipe size and pressure, the District may require all fittings to be mechanically restrained at joints in combination with thrust blocking per Detail W01 of Standard Drawings intended to prevent upstream and downstream separation of the pipe joints.

3.4 Polyethylene Encasement – All buried pipe and fittings shall be wrapped in polyethylene encasement to prevent contact with the surrounding backfill and bedding materials; overlap and ends of polyethylene tube shall be secured with plastic tie-straps. Installation of polyethylene encasement shall be in accordance with the Standard Drawings and AWWA C105, Method A.

All lumps of clay, mud, cinders, etc. on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embedment material from becoming trapped between the pipe and the polyethylene.

3.5 Testing and Disinfection - Testing and disinfection shall be performed on all pipelines, in accordance with Section 02660 and project requirements.

END OF SECTION

SECTION 02640
GATE VALVES

1.0 GENERAL

1.1 Scope - This specification governs materials and installation of resilient wedge gate valves 2 thru 12-inch sizes to be furnished and installed by Contractor at locations shown on the plans or as required by the District.

1.2 Submittals – Furnish manufacturer's drawings and specifications for valve and materials, end connections and information regarding the nut and/or handwheel operators to be furnished.

2.0 MATERIALS

2.1 General – Gate valves shall be AWWA C515 ductile iron body, resilient wedge non-rising stem design certified to NSF 61 and 372 and UL Listed and FM approved for 250-psig working pressure (375-psig seat and 500-psig shell tests). Gate valves shall be Mueller Co., American (ACIPCO), or equal.

2.2 Body – The body shall be constructed of ductile iron ASTM A536 with wall thickness per Table 2 of AWWA C515 and marked "D.I." or "Ductile Iron" cast on body; heavy wall and/or cast gray-iron bodies are not acceptable. The body shall have a smooth, oversized waterway. Prior to assembly, all internal and external ferrous surfaces of body and bonnet shall receive electro-statically applied fusion-bonded epoxy coating complying with AWWA C550. All exterior valve body bolting shall be 304 stainless steel with hexagonal heads and dimensions per ANSI B18.2.1; metric size and/or socket head cap screws or bolts are not allowed. All body gaskets shall be pressure energized O-ring style design.

2.3 Wedge - Ductile iron fully encapsulated in EPDM rubber with protective Acetal polymer wedge guide covers, unless otherwise approved by District.

2.4 Stem – Forged or cast manganese bronze (ASTM B138 C67600 or ASTM B763 C86700), sealed by three O-rings, and thrust washers located above and below the thrust collar to reduce operating torque.

2.5 Operators - For all buried/underground applications, including vertically oriented valves inside vaults, provide 2" AWWA nut; the operating nut shall be 2" square constructed of ductile iron fitted to a square tapered stem to help ensure even valve operating input torque. Handwheel operators shall be provided for all above ground valves and horizontally oriented valves inside vaults.

3.0 EXECUTION

3.1 Storage - Valves shall be delivered and stored in the field with the port openings covered with plastic, cardboard, or wood. These covers shall remain in place until the valve is ready to be installed. Valves shall not be stored in contact with bare ground. Valves shall not be stacked on top of one another.

3.2 Installation – Valves shall be installed in accordance to the manufacturer's instructions and the District's Standard Drawings, unless special installations requirement are otherwise shown on the project drawings.

3.3 Polyethylene Encasement – All buried valves and connections shall be encased in polyethylene per AWWA C105.

3.4 Operation - Immediately before installation, each valve shall be operated through one complete open-close cycle and visually checked for proper operation. Installation of valve boxes shall begin immediately after pipe sections containing the valve have been installed. All valve boxes, paving rings, and lids shall be brought to grade after pavement has been constructed.

END OF SECTION

SECTION 02645
WATER SERVICE LINES AND APPURTENANCES

1.0 GENERAL

1.1 Scope - This section governs materials and installation for 1-inch size standard residential water services from the main line to and including the meter box and setup for a standard 5/8"x3/4" meter. Existing, active services shall be re-connected downstream of the new meter box re-establishing water service.

1.2 Submittals – Provide shop drawings for all listed materials.

2.0 MATERIALS

2.1 Service Line Materials - Service line materials include service line pipe, service saddles, service fittings, meter stops, corporation stops, curb stops, and ball valves. All items are to be furnished as shown in the approved "Materials List" and delivered with the required markings. All materials shall comply with ANSI/NSF 61 and State of California AB 1953 "no-lead" requirement.

2.2 Approved Materials – provide materials for service lines as listed below:

ITEM	DESCRIPTION	MANUFACTURER
Tracer Wire	#12 solid copper, Type UF with 3M DBR splice kits	
Corporation Ball Stop	Conforming to AWWA C800 for use with 1" CTS P.E. Tubing	Ford FB1100-4 Mueller P-25028
Angle Meter Stop	Conforming to AWWA C800 for use with 1" CTS P.E. Tubing and 5/8"x3/4" meter	Ford BA43-342W Mueller P-24258
Meter Valve	Conforming to AWWA C800 for use with 1" F.I.P. and 5/8"x3/4" meter	Ford B13-342W Mueller B-24351
Meter Idlers	7-1/2" length for standard 5/8"x3/4" meter	Ford Idler-2 Mueller H-10887
Service Tubing	Flexible polyethylene tubing AWWA C901, PE 4710/3408, CTS, SDR 9, ASTM D2737	JM Eagle Pure-Core (Blue Exterior)
Insert Stiffeners	For connecting 1" CTS P.E. tubing to corporation stop and angle meter stop.	Ford Insert 52 Mueller 528705
Service Saddles	AWWA C800, bronze body ASTM B62; bolts and straps silicon bronze, gaskets Nitrile or EPDM	Ford S912 (C900) Ford 202B (DIP/other) Jones J-996 (C900) Mueller BR2B (DIP/other)
Meter Box	Heavy wall plastic meter box designed for 20,000-lbs vertical load and medium duty, non-deliberate traffic (black color).	Carson HW-1730-BCF (HDPE Solid Cover)

3.0 EXECUTION

3.1 Polyethylene Tubing - Tubing and fittings should be stored in a way that prevents damage due to crushing or piercing, excessive heat, harmful chemicals, or exposure to sunlight for prolonged periods. The manufacturer's recommendations regarding storage should be followed.

Handling operations and trench installation and backfill shall be performed with reasonable care to prevent scratches, nicks, and gouges in the tubing. Tubing cut or excessively kinked shall not be used.

Bends in PE tubing shall not occur closer than 10 diameters from any fitting or valve. The minimum radius of curvature is 30 diameters or the coil radius when bending with the coil. Bending of coiled tubing against the coil shall not go beyond straight. Polyethylene tubing that becomes kinked during handling or installation shall not be used, and care should be taken to ensure that kinking does not develop after installation. Service line from the main line tap to the angle meter stop shall be one continuous length of tubing without any splices.

PE tubing shall be installed in trench bottoms with 6 inches of bedding material to provide continuous and uniform support. The initial backfill shall be 6 inches above the tubing and shall be free from rock, stones, and debris.

3.2 Service Saddles - The service saddle shall be no closer than 18 inches to a valve, coupling, joint, or fitting, unless it is at the end of the main. The surface of the pipe shall be free of all loose material and have a clean, hard surface before placing the saddle. The service saddle shall be tightened firmly to ensure a tight seal; however, care shall be used to prevent damage or distortion of either the pipe, corporation stop, or service saddle by over- tightening. The drilling of the pipe shall be performed in accordance with the manufacturer's instructions.

3.3 Fittings, Angle Meter Stops, and Boxes - Installation of fittings, meter stops, and boxes shall be as recommended by the manufacturer. Pipe or fittings made of nonferrous metals (bronze) shall be isolated from ferrous metals with insulating unions or couplings as directed by the District.

3.4 Hydrostatic Testing & Disinfection - The Contractor shall hydrostatic test and disinfect all service appurtenances at the same time as the main line; the service line shall be thoroughly flushed after disinfection until obtaining a safe, normal operating chlorine residual.

END OF SECTION

SECTION 02660
PRESSURE TESTING AND DISINFECTING OF WATER MAINS

1.0 GENERAL

1.1 Scope - All water mains, including hydrants, valves, services and other appurtenances shall be flushed, tested and disinfected by the Contractor and this work witnessed by the District. Contractor shall furnish all temporary piping, fittings, valves, pumps, calibrated supply tanks, gauges, and all other materials and equipment required to perform tests and make necessary repairs. Only potable water shall be used; when potable water is drawn from the existing system, the Contractor shall provide an adequately sized, certified reduced pressure backflow device including control valves and pressure regulation.

The pressure and leakage tests shall be performed simultaneously. Hydrostatic tests shall not be performed until after installing the water line, appurtenances, and thrust blocks and backfilling and compacting the trench. In roads, testing shall be done before placing final pavement. The Contractor may, at any time and at his own expense, perform additional pressure and leak tests, but these will in no way be in-lieu of final tests witnessed by the District.

Disinfection shall be in accordance to AWWA C651 and additional requirements as described in this section. After having been successfully tested, disinfected and flushed to normal operating chlorine residual and passing bacteriological tests, the water main shall be connected to the existing distribution system.

1.2 Submittals – The Contractor shall prepare and submit written plans, procedures, and proposed schedule for flushing, testing and disinfection including materials, equipment, sources of potable water, chemicals, method of chlorination and dechlorination, control and disposal of used water, copies of applicable permits, and other information as appropriate. The Contractor shall schedule each field event with District a least one (1) week in advance of proposed date(s) and each event shall appear on the three (3) week schedule.

2.0 MATERIALS

2.1 General - All test equipment, chemicals for chlorination, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor, subject to the District's review. All chemicals and materials shall comply NSF/ANSI 60 and NSF/ANSI 61, respectively. No materials shall be used which would be injurious to the work or its future function.

2.2 Hydrostatic Testing Equipment - Contractor shall be responsible for supplying and operating all testing equipment. The District may furnish a test gauge at its option. Temporary piping connecting to an existing main for water supply shall be protected with an adequately sized certified reduced pressure backflow device and pressure reducing valve.

2.3 Chlorine - Chlorine for disinfection shall be sodium hypochlorite solution complying with ANSI/AWWA B300 and NSF/ANSI 60.

3.0 EXECUTION

3.1 General - Contractor shall correct all defects in workmanship or materials, which become evident by inspection or testing at any time during the work. Water mains under construction that become flooded by storm water or groundwater shall be drained and flushed with potable water until clear water is evident. All pipelines and potable water components shall be flushed, tested and disinfected in the presence of the District. Disinfection operations shall be scheduled by the Contractor so as to assure the maximum degree of sterility of the facilities as soon as District accepts the work and facilities are placed into service. The District shall perform bacteriological testing. Release of water from pipelines, from flushing, testing and disinfecting shall be de-chlorinated and completed in accordance with a written disposal plan approved by the District.

3.2 Hydrostatic Test - The purpose of the hydrostatic test is to test the ability of the pipeline to withstand pressure and check for allowable leakage; both tests shall run simultaneously. All valves and appurtenances shall be operated during the test period; appurtenances shall be left on during the test. Thrust blocks shall have been in place for at least seven days for standard concrete mix or thirty-six (36) hours if using a high-early-strength mix.

A. Initial Filling & Flushing - Prior to testing, the new main shall be slowly filled (velocity ≤ 1.0-ft/sec) with potable water from low end of the section and air vented from the pipe and appurtenances in a manner not causing excessive air pressure. Once completely full of water, a flushing velocity of 2.5 to 3.0-ft/sec shall be applied to scour the pipeline and any remaining air pockets by opening services, hydrants, blow-offs, air release valves, and venting from uphill end. The valve controlling the admission of water into the section of pipe to be tested should be opened wide before shutting hydrants and blow-offs. After the system has been thoroughly flushed, all valves controlling the section to be tested shall be closed and the line soaked in this condition under a slight pressure for a period of 24-hrs to allow the cement mortar to absorb water.

B. Test Section Length - The length of pipe being tested at any one time shall not exceed 2,000 feet unless otherwise approved by the District; shorter test sections may be required depending on the sequence of work.

C. Test Pressure –The test pressure shall be 150-psig or 50-psig greater than design pressure of the system, whichever is greater, measured at the lowest point of the section of the pressure zone being tested. Initial tests shall be done before making tie-in connections to the existing system; tie-in's shall be isolated and tested to 50-psig greater than working pressure of existing system as measured in field or as directed by the District. All new valves shall be tested against a reduced

pressure side; if used, butterfly valves shall be tested in both directions.

D. Test Duration/Leakage – The test pressure shall be maintained within ± 3-psi of the test pressure for minimum two (2) hour duration by adding water; the amount of water added/pumped into the main during the test period shall be accurately measured to calculate the leakage. This amount shall be checked against the allowable leakage advised by AWWA C600-05, Table 5A. The individual testing of the valves may be of a shorter duration as approved by the District.

E. Repairs - During the pressure and leakage test, all accessible appurtenances shall be inspected for visual signs of leakage. All visual leaks shall be corrected immediately, regardless of the amount of leakage and the test shall be run again for its full duration. All leaks detected shall be repaired to a watertight condition. All repairs made shall be retested in accordance with the specifications. All repairs shall be made and a successful test accomplished prior to taking bacteriological samples.

3.3 Disinfecting - After completion of pressure testing, the Contractor shall disinfect all water mains, services, and appurtenances. Disinfection shall be accomplished in accordance with the latest revision of AWWA C651. Chlorination and dechlorination shall be performed by competent individuals knowledgeable and experienced in the operation and safety of disinfecting procedures with the applicable Federal, State, and local laws and regulations. Transporting, storage, and handling of these materials shall be performed in accordance with Federal and State Hazardous Materials Regulations.

The basic disinfection steps consists of:

1) Prevent dirt, mud, groundwater and other contaminating materials from entering water main during storage, construction and repair; remove contaminating materials by flushing or other means.
2) Disinfect the new main by chlorinating with a 25-mg/L hypochlorite solution for 24-hour period, then flushing with potable water.
3) Protect existing distribution system from backflow due to hydrostatic testing and disinfecting procedures.
4) After disinfecting, verify bacteriological quality by lab tests before making final connections between new water main and active system.

A. Sodium Hypochlorite – A sodium hypochlorite solution shall be used for disinfecting by the continuous-feed method. The point of injection shall correspond with the point of entering dilution water, either at end or within 10-ft of the end of the test section; the solution shall be injected using a suitable chemical feed pump and thoroughly mixed with incoming potable water as it enters the test section. A backflow prevention device shall be installed at the point of connection to the potable water source.

B. Filling and Contact - The main shall be filled at a constant rate (velocity ≤ 1.0-ft/sec) with minimum concentration 25-mg/L chlorine throughout the system

and held for at least twenty-four (24) hour duration. During this time, valves, hydrants, blowoffs, air valves, and other appurtenances shall be operated and flushed to move the chlorinated water throughout the system to ensure disinfection. After 24-hr holding period there shall be a free chlorine residual of not less than 10-mg/L.

C. Final Flushing – After applicable retention period, heavily chlorinated water should not remain in prolonged contact with pipe. In order to prevent damage to the pipe lining or corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed and dechlorinated from the main until chlorine measurements throughout the new water main match the existing system background chlorine levels, as approved by the District. The Contractor shall submit the method of dechlorination; chemicals for dechlorination are listed in Appendix C of AWWA C651.

D. Disinfecting Cut-In Connections – When connecting to an existing water main with a cut-in tee or making other repairs, the trench excavation shall be kept dewatered during this work. The interior of the pipe, couplings, fittings, valves and other components that make up the connection assembly shall be swabbed with a minimum 1% hypochlorite solution in accordance to AWWA C651. Flushing towards location of the work/repair from both directions is recommended, if valve and hydrant locations permit, and is continued until eliminating all discolored water.

E. Hot Taps - Before tapping sleeve is installed, exterior surface of the main are to be cleaned and interior surface of the tapping sleeve, outlet, and valve shall be swabbed with a minimum 1% hypochlorite solution.

3.4 Bacteriological Tests - After completion of testing and sterilization and before the new water main is connected to the distribution system, the District will take water samples for bacteriological examination. Should any samples fail to meet minimum State of California, Department of Public Health requirements, the Contractor will continue to chlorinate and flush the system, as directed, until a satisfactory sample is obtained.

A. Basic Sampling Procedures - After final flushing and after the water has remained in the new main for at least 16 hours, two (2) consecutive sets of acceptable samples, taken at least twenty-four (24) hours apart, shall be collected from the new main. At least one (1) set of samples shall be collected from every 1,200 feet of the new water main, plus one (1) set from the end of the line, and at least one (1) set from each branch. All samples shall be tested for bacteriological quality in accordance with Standard Methods for the Examination of Water and Wastewater and shall show the absence of coliform organisms. A standard heterotrophic plate count may be required, at the option of District.

B. Extra Sampling Intervals - If trench water entered the new main during construction or, in the opinion of District, excessive quantities of dirt or debris have entered the new main, bacteriological samples shall be taken at intervals of each two hundred (200) feet and identified by location. Samples shall be taken after water has stood in the new main for at least sixteen (16) hours after final flushing has been completed.

C. Redisinfection - If the initial disinfection fails to produce satisfactory bacteriological samples, the main may be reflushed and shall be re-sampled. If check samples show the presence of coliform organisms, then the main shall be rechlorinated until satisfactory results are obtained.

NOTE: High velocities in the existing system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is well to also sample water entering the new main.

END OF SECTION

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SECTION 03300
CONCRETE AND REINFORCING STEEL

1.0 GENERAL

1.1 Scope - This specification includes concrete materials, mixing, placement, form work, reinforcement and curing. All materials used in mix design shall be NSF 61 approved or trial batch submitted to NSF for site mix evaluation/certification.

1.2 Submittals - Prior to placement, the following shall be submitted:

A. Concrete mix design
B. Reinforcing steel schedule and shop drawings
C. Delivery tickets

1.3 Project Conditions – Concrete work shall occur during May through October, unless otherwise approved/authorized by the District.

2.0 MATERIALS

2.1 Concrete – Concrete shall be composed of cement, aggregate and water proportioned and mixed as specified in State Standards Section 90, "Portland Cement Concrete". Concrete for each portion of work shall be of the class as shown on the plans or as indicated below for the type of work performed.

Caltrans Class	Type of Work	Cement (lbs/cy)	28-day Compressive Strength
Class 1	Special Applications Only	675	5,000-psi
Class 2	Slabs, foundations, footings, ring walls, retaining walls, vaults, manhole bases, etc.	590	4,000-psi
Class 3	Sidewalks, curb, gutter, thrust blocks, valve and hydrant aprons and pipe encasements	505	3,000-psi

A. Mix Design: Type II Portland cement, fine aggregate (clean natural sand) and coarse aggregate (crushed rock) with 1" maximum combined grading, maximum 0.45 water/cement ratio, 2"-4" slump and 4% to 7% entrained air.

B. Fly Ash: For all non-potable water applications, substitute 15% by weight of cementitious material with ASTM C618, Type F fly ash. For all potable water applications, fly ash cannot be substituted unless mix design is tested and pre-approved per ANSI/NSF-61 by trial batch in advance of construction.

C. Admixtures: Conform to ASTM C494, Types A-E and certified to NSF-61 shall be used to obtain higher slump if needed for improved pumpability or to retard/accelerate mix. BASF Master Pozzolith 322 (water reducing) and MasterAir AE 90 (air entraining) are approved per NSF-61.

2.2 Grout – Patch, seal, repair all surface imperfections and defects with a suitable grout mixture.

2.3 Reinforcing Steel - ASTM A615, Grade 60. Reinforcing steel shall be fabricated in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Reinforcing steel shall be delivered to site bundled and tagged for identification.

2.4 Tie Wire - Tie wire shall be 16-gage minimum, black, soft annealed.

2.5 Bar Supports - Bar supports exposed to view after form stripping shall be galvanized or plastic coated. Concrete supports (blocks) shall be used for reinforcing for concrete placed on grade.

2.6 Forms - Forms shall be constructed of clean lumber and braced to provide sufficient strength and rigidity to hold the concrete and withstand the necessary pressure and consolidation without deflection from the prescribed lines. The surface of forms against which concrete is placed shall be smooth and free from irregularities, dents, sags, or holes. The surface shall leave uniform form marks conforming to the general lines of the structure. Forms previously used shall be thoroughly cleaned of all dirt, mortar and foreign matter before being re-used.

3.0 EXECUTION

3.1 Formwork - The Contractor shall notify the District a minimum of one working day before the intended placement of concrete to enable the District to check the form lines, grades, and other required items before placement of concrete. Unless otherwise indicated on the plans, all exposed sharp concrete edges shall have a ¾ -inch chamfer. Before placing concrete, the form surface shall be clean and coated with form oil of high penetrating qualities where applicable.

3.2 Reinforcement - Reinforcing steel shall be placed in accordance with the current edition of Recommended Practice for Placing Reinforcing Bars, published by the Concrete Reinforcing Steel Institute. All reinforcing steel shall be of the required sizes and shapes and placed where shown on the drawings; the Contractor shall not use bars with bends not otherwise shown on the drawings. All reinforcing steel shall be cold bent and not straightened or re-bent in a manner that will damage the material. All bars shall be free from rust, scale, oil, dried mortar, or other coatings that reduce or destroy the bond between concrete and steel.

Reinforcement steel shall be positioned in accordance with the drawings and secured by using annealed wire tires or clips at intersections and supported by concrete or metal supports, spacers, or metal hangers. Tie wires shall be bent away from forms in order to provide the specified concrete coverage. In addition to any shown on the drawings, bars may be found necessary or desirable by the District for the purpose of securing reinforcement in position, shall be provided.

All reinforcing steel shall be completely encased in concrete. Reinforcement shall be

placed a minimum of 2.5-inches clear of any metal pipe or fittings. The reinforcement shall be so secured in position that it will not be displaced during the placement of concrete.

Reinforcing dowels shall be secured in place prior to placing concrete. The Contractor shall not press dowels into the concrete after the concrete has been placed. The minimum lap for all reinforcement shall be 40 bar diameters.

Additional reinforcement shall be placed around the pipe or openings as indicated in the drawings.

3.3 Embedded Items - All embedded bolts, dowels, anchors, pipes, conduits, sleeves, and other such items shall be held correctly in place in the forms before concrete is placed. Items of aluminum embedded in concrete shall have all surfaces powder coated. Pipes and conduits penetrations shall not be placed closer than 3 diameters on center.

3.4 Placing Concrete – Concrete placement shall comply with ACI 304R; hot or cold weather placement shall comply with ACI 305 and ACI 306, respectively. Prior to placing concrete all debris (loose tie-wire, rocks, wood, etc.) shall be removed and the surfaces are to be dampened which will be in contact with the concrete. No concrete shall be placed in water, mud or unstable subgrade conditions.

Concrete shall be delivered and placed in forms before taking its initial set. For normal weather conditions within 60-minutes and before 300-revolutions after first adding water to the mix; time between lift placement not exceeding 60-minutes.

Concrete shall be deposited as nearly as practical in its final position to avoid segregation. Concrete shall not be permitted to fall more than 6 feet. In walls, lift depth shall be limited to two feet. As the concrete is placed, it shall be thoroughly consolidated through the entire layer by internal vibration and tamping bars. Vibration shall not be used to move concrete horizontally. The vibrator shall be inserted vertically such that there is an overlap of the fields of action.

All concrete surfaces upon which or against which the concrete is to be placed, and to which new concrete is to adhere, shall be roughened, thoroughly cleaned, wet or sandblasted to bare aggregate as directed. An approved bonding agent shall be used before the concrete is deposited.

3.5 Construction Joints - Location of and type of construction joints shall be as directed by the Engineer. The surface of all construction joints shall be cleaned and all laitance removed.

3.6 Concrete Finishing – Contractor shall screed, float, edge and trowel finish concrete surfaces. Submerged surface of tank floor slab shall be level and smooth with normal trowel finish; surface shall be within ¾-inch of design elevation per ACI 117 with composite flatness (F_F) and levelness (F_L) not exceeding 20 and 15, respectively. Other concrete surfaces shall be smooth, free from projections and irregularities. Exposed formed surfaces to be Class B per ACI 347-04 and all voids neatly filled with mortar immediately upon removal of forms. Exposed surfaces of concrete not finished against forms, such as horizontal or sloping surfaces, shall be screeded to a uniform surface and worked with suitable tools to smooth, normal trowel finish. Exposed edges shall have ¾-inch chamfer

or tooled radius. A non-slip light broom finish shall be applied to walkways and other pedestrian areas.

3.7 Protection and Curing of Concrete - Contractor shall protect all concrete against damage, freezing, cracking, etc. Exposed surfaces of new concrete shall be protected from direct rays of the sun and from frost. Concrete shall be kept submerged or thoroughly dampened daily using potable water for at least two weeks after concrete has been placed or by using an approved curing process.

END OF SECTION

SECTION 13210
TEMPORARY WATER STORAGE SYSTEMS AND TEMPORARY PIPING

PART 1 – PART 1 - GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, tools, equipment and incidentals necessary to install and place into successful operation the temporary water storage tanks with fittings and accessories for a complete installation in the positions and orientations as shown on the Drawings and as specified herein.

B. Section includes:

1. The temporary water storage tanks include the following:
   a. Temporary water storage tanks.
   b. Accessories.

C. **The District will furnish the Contractor 2-8,000 Gallon Temporary Water Storage Tanks to use for the Project. Temporary water storage tanks are currently at Larkspur Tank Site, Contractor will be responsible for relocating tanks for use at various sites and return Tanks to Larkspur tank site when Project is Complete.**

1.02 REFERENCES

A. ASTM (American Society for Testing and Materials) Standards:

1. D618 Conditioning Plastics and Electrical Insulating Materials for Testing.
2. D638 Tensile Properties of Plastics.
3. D746 Test Method for Brittleness Temperatures of Plastics and Elastomers by Impact
4. D790 Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
5. D883 Definitions of Terms Relating to Plastics.
6. D1505 Density of Plastics by the Density-Gradient Technique.
7. D1525 Test Method for Vicat Softening Temperature Plastics.
8. D1693 Test Method for Environmental Stress-Cracking of Ethylene Plastics.
9. D1998 Standard Specification for Polyethylene Upright Storage Tanks.
10. D 2765 - Degree of Crosslinking in Crosslinked Ethylene Plastics as Determined by Solvent Extraction.
11. D 2837 - Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
12. D3892 Practice for Packaging/Packing of Plastics.
13. F412 Definitions of Terms Relating to Plastic Piping Systems.

B. ANSI Standards:

1. ANSI/ASME B-16.5 Pipe flanges and flanged fittings.

C. ARM (Association of Rotational Molders) Standards:

1. Low Temperature Impact Resistance (Falling Dart Test Procedure).

1.03 DEFINITIONS

A. Useable Volume: Useable volume shall be defined as the volume stored between the invert of the tank overflow and the centerline of the tank outlet. Actual or rated tank capacity may be more than usable volume.

1.04 SYSTEM DESCRIPTION

A. Any materials and equipment descriptions specified herein shall be considered as minimum requirements. In no event shall the temporary water storage tanks be less than specified herein.

B. If Contractor choses to rent/lease tanks, these tanks shall be previously unused, certified by supplier for potable water use only, and meet all requirements of NSF 61. Prior to placing tanks into service, Contractor shall clean, disinfected (AWWA C652-11), tested, and flushed tanks.

C. Up to fourteen (14) days may be required to verify bacteriological results and perform other water quality tests before Contractor is approved to connect tanks to water system; if samples fail water quality tests, it is the Contractor's responsibility to remedy the problem and eliminate sources of contamination.

1.05 SUBMITTALS

A. Shop drawings:

1. Equipment/material layout Drawings to include the following items.
   a. Equipment and material scale layout plans and sectional views.
   b. Connection details showing incorporation of materials into the Work.
   c. Location and orientation of openings, fittings, accessories, and supports.
   d. Equipment/material schedule to include the following items:
   e. a. Manufacturer's name and model numbers.
   f. b. Complete description in sufficient detail to permit item by item comparison with the specifications.
   g. Materials of construction for the bolts, gaskets, fittings and resign manufacturer data sheet.
   h. Dimensions and required clearances.
   i. Weights of components.
   j. Performance characteristics including working capacity and brim-full capacity.
   k. Sizes and quantities of accessories.
   l. Details on fittings, manways, flexible connections, vents, and level indicators.

B. Product data:

1. For each storage tank, provide:
   a. Catalog cut sheets.
   b. Specifications pertaining to the tanks.
   c. Tank resin and hoop stress data.

C. Maintenance and operating instructions:

1. Provide preventive maintenance plans for the tanks and include the following:
   a. Instructions.
2. Unloading and Installation Instructions.
3. Manufacturer's shop and field hydrostatic testing procedures.

D. Warranty:

1. Contractor's express warranty to the Owner.
2. Manufacturer's express warranty.
3. Manufacturer shall provide a full one (1) year warranty against manufacturer's defect and workmanship for each tank. Prorated warranties are not acceptable.

E. Quality control:

1. Test reports:
   a. Factory test report:
      1) Material, specified gravity rating at 600 psi at 110 degrees F, design hoop stress.
      2) Wall thickness verification.
      3) Fitting placement verification.
      4) Visual inspection.
      5) Impact test in accordance with ASTM D1998.
      6) Gel test in accordance with ASTM D1998.
      7) Hydrostatic test in accordance with ASTM D1998.

1.06 QUALITY ASSURANCE

A. The tanks of the same material furnished under this Section shall be manufactured by tank equipment manufacturer who has been regularly engaged in the design and manufacture of temporary water storage tanks for over ten (10) years.

B. Tanks shall be manufactured by manufacturing facility with a Quality Management System.

C. Tanks shall be manufactured from virgin materials.

1.07 PROJECT/SITE CONDITIONS

A. Environmental requirements:

1. Project site is 4,900± feet above mean sea level.
2. Freeze conditions exist at the project site during winter months.

B. Equipment will be installed outdoors.

C. Ambient temperature 10 degrees F to 110 degrees F.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable manufacturers:

1. Poly Processing Company.
2. Snyder Industries Incorporated.
3. Or equal.

2.02 MATERIALS

A. Tanks shall be rotationally-molded high density linear or cross-linked polyethylene, one (1) piece seamless construction, cylindrical in cross-section and vertical in axis.

B. Resin:

1. Type 1 tanks shall be made from high density polyethylene resin.
2. Material shall be virgin polyethylene resin as compounded and certified by the manufacturer.
3. 3. Ultra violet stabilizer: Provide one of the following:
   a. Provide a UV 8 stabilizer as recommended and compounded by the resin manufacturer.
   b. Carbon black: Add 0.35 percent carbon black compounded into the resin by the resin manufacturer.
   c. UV stabilizer in the type and amount recommended by the resin manufacturer.
4. Pigments (where required) shall not exceed 0.25 percent (dry blended) of the total weight.

C. Wall thickness for a given hoop stress is to be calculated in accordance with ASTM D 1998. Tanks shall be designed using a hoop stress no greater than 600 psi. Wall thickness calculations shall assume that tank contents have a design specific gravity as scheduled. Design specific gravity is higher than the specific gravity of the tank contents. In NO case shall the tank thickness be less than design thickness.

D. The vertical storage tanks shall be cylindrical tanks with flat bottoms and a dished top. The tanks shall be suitable for outdoor water storage under ambient temperatures as specified under paragraph 1.08.

E. Each tank shall be constructed so that the top of the tank can support a minimum of 136 pounds per square foot snow load. The bottom knuckle radius shall be a minimum of 1-1/2 inches. The top head shall be integrally molded with the cylinder wall.

F. Lugs:

1. Lifting lugs: Tanks shall have a minimum of three lifting lugs integrally molded into the top head. The lifting lugs shall be designed to allow erection of an empty tank.
2. The tanks shall be designed to provide a minimum of four tie-down lugs designed to allow tank retention in wind and seismic loading situations without tank damage.

G. Fittings and appurtenances:

1. Locate per Drawing.
2. Fittings: As scheduled.
   a. Threaded bulkhead fittings:
      1) Provide threaded fittings where indicated on the Drawings, but in no case shall threaded fittings be allowed below the invert elevation of the tank overflow nozzle elevation.
      2) Threaded fittings may be installed at or above the centerline of the tank overflow elevation unless indicated otherwise on the Drawings or as specified.
      3) Threaded connections shall conform to ANSI/ASME B 16.4.
      4) Fittings shall be compression threaded type, polyvinyl chloride or polypropylene flanged fittings with deep cut threads.
      5) All threads to be National pipe thread (NPT) cut.
      6) Provide 1/4-inch thick, 40 to 50 durometer EPDM gaskets, 60-70 durometer Viton gaskets, or other material as scheduled or as required for compatibility with tank contents to seal threaded fitting body to tank wall on inside of tank.

b. Bolted double flange fittings:
    1) Provide bolted double flange fittings for all connections below the tank overflow nozzle invert elevation unless otherwise specified.
    2) Flanges shall be 150 pound and conform to ANSI/ASME B 16.5.
    3) The bolted double flange fittings shall allow tank wall thickness up to 2-1/2 inches.
    4) Each bolted double flange fitting shall be constructed with two 150 pound flanges, two 150 pound flange gaskets, and the correct number and size of all-thread bolts for the flange specified by the flange manufacturer.
    5) The flanges shall be constructed of Schedule 80 PVC or polypropylene.
    6) Gaskets shall be a minimum of 1/4-inch thickness and constructed of 40 to 50 durometer EPDM, 60-70 durometer Viton gaskets, or other material as required for compatibility with tank contents as scheduled.
    7) Hardware material: As scheduled.
    8) All flanged bolt heads where installed inside the tank shall be encapsulated with polyethylene preventing fluid contact with the bolt material.
    9) Provide gaskets on the bolt head surface inside tank to seal encapsulated bolt head surface inside the tank to provide a sealing surface against the tank wall.
c. Flanged outlet drain fitting in the lower tank sidewall:
    1) Outlet fitting shall be provided with a siphon fitting to allow full drainage of tank contents.
d. Fittings on tank top:
    1) Bosses molded into the tank.
    2) Fittings shall be made vertical on sloping tank tops and located on flat areas fabricated into tank top dome.
    3) The top head shall be integrally molded with the cylinder shell.
    4) Provide for the level sensor and any other required equipment.
e. Manways:
    1) Opening size: 24”
    2) Manways shall be bolted in accordance with ASTM D1998. Furnish with gaskets to form tight seal. Number of bolts shall be as required to form tight seal.
    3) Locate top of tank dome.
    4) Hardware material: 304 stainless steel.
    5) Gasket material: Closed cell, cross-linked polyethylene foam, Viton, or EPDM materials as required for chemical compatibility with stored contents.
    6) Equip manway with emergency pressure relief device to vent tank upon over-pressurization.
f. Tank venting:
    1) Manufacturer shall design and provide vent openings and associated vent piping for each tank. Vents shall be “U” shaped or designed to prevent water, animal and insect ingress. Vent sizing shall be as required to protect tank from over-pressurization or from vacuum conditions as described herein, and in accordance with OSHA requirements.
    2) Vent sizing:

a) Design venting system to handle the maximum expected fill during fill operations or during tank transfer operations without pressurizing tank. Manufacturer to size vent and/or provide weighted hinged manway designed to prevent over pressurization.
b) Design venting system to handle maximum anticipated withdrawal rates when drain and/or outlet valves are opened to drain tank contents, or when emptying tank during transfer operations.
c) Vents shall be provided with insect screens. Manufacturer shall include impact of insect screens on open area to size vents.

3) Vents shall comply with OSHA 1910.106(F)(iii)(2)(IV)(9).
4) Manufacturer shall design and supply vent piping as required based on tank fill operations as defined above, or based on inlet and outlet pipe sizes and maximum expected fill and withdrawal rates, but in no case shall vent piping be less than diameter shown on the Drawings.

2.03 FABRICATION

A. Shop assembly:

1. Tanks shall be factory assembled with the required openings installed.

B. Tolerances:

1. The equipment tolerance shall be as stipulated in the manufacture's literature. Shop Drawings and installation manual.

C. Tank labels:

1. Permanent identification labels showing the following information:
   a. Name of manufacturer.
   b. Date of manufacture.
   c. Design wall thickness.
   d. Design specific gravity.
   e. Design pressure and temperature.
   f. Vessel diameter, height, and weight.
   g. Gallons per inch.
   h. Gallons per foot.
   i. Total tank gallons.
   j. Useable gallons.
   k. Tank construction material.

2.04 SOURCE QUALITY CONTROL

A. Test:

1. Hydrostatic Water Test: Each of the storage tanks shall have all openings blind flanged and be filled to specified capacity with potable water. The water shall remain in the tanks a minimum of 24 hours. After 24 hours, the tanks shall be inspected for any leakage. If there is any leakage, repairs shall be made and the test shall be repeated until satisfactory results are obtained. A certified test report shall be submitted.
2. Ultrasonic Tank Thickness Test:

a. All tanks shall be measured for tank wall thickness at 6 inches, 1, 2, and 3 feet on the tank sidewall height at 0 degrees and 180 degrees around the tank circumference with 0 degrees being the tank manway and going counter-clockwise.

B. Inspection:

1. The manufacturer shall inspect the equipment and rectify all noted deficiencies prior to shipment.
2. Tank wall shall be free of holes, blisters, crazing, cracking, delamination, undispersed raw materials and any sign of contamination from foreign matter.
3. Tank wall shall be free of visual defects such as foreign inclusions, air bubbles, pinholes, pimples, crazing, cracking and delaminations.
4. All cut edges where openings are cut into the tanks shall be trimmed smooth.

PART 3 - EXECUTION

3.01 EXAMINATION

A. The Contractor shall be responsible for coordination of the equipment dimension requirements stipulated on the Shop Drawings and the piping to be installed.

3.02 PREPARATION

A. Delivery, storage and protection.

1. All material labels or tags shall be intact and legible.
2. Handle and store all equipment carefully. Any damaged equipment will not be acceptable.

3.03 INSTALLATION

A. Install equipment in accordance with conforming submittals and manufacturer's instruction as shown on the Drawings and specified herein.

B. Tank pad:

1. Install pad between tank bottom and concrete pad (polyethylene, neoprene, asphalt, or other material as recommended by tank manufacturer) as required to project the tank bottom from surface irregularities.

3.04 FIELD QUALITY CONTROL

A. Inspection:

1. The Contractor shall inspect all parts of the Temporary Tanks installation for proper installation and conformance to the Drawings and manufacturer's recommendations.
2. Hydrostatic testing: Before equipment attached:
   a. Plug outlets.
   b. Fill with potable water.
   c. Check for and repair all leaks.
3. Cleaning and disinfecting: Thoroughly rinse with disinfected, potable water.
4. Contractor is notified that the tanks are a confined space and shall not be entered without proper authorization and safety measures in place, per OSHA and local

standards.

END OF SECTION

SECTION 15114
ALTITUDE AND BACK PRESSURE VALVE

1.0 GENERAL

1.1 Scope – This specification governs materials and installation of pressure NSF 61 approved altitude and back pressure valve complete and operable, in accordance with the Contract Documents.

1.2 Submittal – Furnish submittals in accordance with the Section 00700-7.16 and Section 00800- SC- 7.20.

1.3 Warranty - The valve specified in the Section shall be warranted for a period of one (1) years from the date of shipment to be free of defects in materials and workmanship.

1.4 Equipment –

Location #1 – Arnold Tank 13 (Flume Court)
Cla-Val Model 610-09 Combination Altitude and Back Pressure Valve
6-inch CL 150 Flanged Valve with 1" Level Sensor Line

Location #1 – Larkspur Ct. Tank
Cla-Val Model 610-09 Combination Altitude and Back Pressure Valve
8-inch CL 150 Flanged Valve with 1" Level Sensor Line

2.0 MATERIALS

2.1 Valve Characteristics - The Combination Altitude and Back Pressure Valve controls the high water level in reservoirs without the need for floats or other devices. The valve modulates to maintain upstream pressure within close limits to prevent over drawing system supply while filling reservoir tank. When the shut-off point of the hydraulic pilot control is reached, the valve closes smoothly without surges. This valve is designed for one-way flow only.

2.2 Valve Body and Flanges - Valve bodies and flanges shall be ASTM A536 ductile iron and the bodies shall be fusion epoxy coated. All pressure reducing valves are to be Class 150 flanged and all pressure relief valves shall be Class 150 flanged. The valve cover shall be flanged and be of the same material as the body.

2.3 Valve Trim - The valve stems, springs, body seat rings, and bolts, nuts, and washers shall be of Type 304, or 316 stainless steel. The valve stems shall have top and bottom guides and shall be 303 stainless steel. Rubber parts shall be Buna-N. The diaphragms shall be of Nylon-reinforced Buna-N, supported firmly between body and valve cover.

2.4 Valve Controls - The valve shall be furnished with a complete, externally-mounted control system, including adjustable speed control needle valves, strainer, and necessary

stainless steel connecting tubing and fittings. The controls shall be capable of achieving the flow and speed adjustment indicated on the in Section 15114-2.6.

2.5 Manufacturer. – Valves furnished shall be from the Cla-Val Company, with no like, equivalent, or "or equal" item permitted. Cla-Val Model 610-09 Combination Altitude and Back Pressure Valve with no like, equivalent, or " or equal" item permitted.

2.6 Operation Conditions – Operation ranges for the valves shall be as specified in the Table below.

Location	High Water Level Adjustment	Adjustment Backpressure Range PSI
Arnold 13	0-40 FT	0-200 PSI
Larkspur Ct	0-40 FT	0-200 PSI

2.7 Factory Tests - Valves shall be factory tested with a hydrostatic test and a functional test and a test certificate shall be submitted to the Engineer prior to delivery of the valve.

3.0 EXECUTION

3.1 Installation -Valves shall be installed in accordance with provisions of this Section and as indicated on the Drawings.

3.2 Inspection, Startup, and Field Adjustment - The service representative of the valve manufacturer shall be present to assist the Contractor in the installation and adjustment of the valve(s).

END OF SECTION

SECTION 16010
ELECTRICAL

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall install, ready for use, the electrical and instrumentation system as specified herein and shown on the Contract drawings. This document describes the function and operation of the system and particular components, but does not necessarily describe all necessary devices. All components and devices shall be furnished and installed as necessary/required to provide a complete operable and reliable system for accomplishing the functions and meeting the performance set forth hereinafter.

B. Furnish all required labor, materials, project equipment, tools, construction equipment, safety equipment, transportation, test equipment, incidentals, and services to provide a complete and operational electrical & instrumentation system as shown on the E&I - Series Drawings, included in these Specifications or required for a fully operating facility.

C. Examine the specification and Drawings for mechanical equipment and provide all circuit breakers, switches, pushbuttons and appurtenances which are not specified to be with the mechanical equipment. Erect all electrical equipment not definitely stated to be erected by others, furnish and install conduit, wire and cable and make connections required to place all equipment in complete operation.

D. It is recommended that the Electrical Contractor attend the job walk for the site and shall have accomplished the following:

   1. Thoroughly examine existing conditions before submitting his bid proposal to perform any work. He shall compare site conditions with data given on the plans or in these Specifications. No allowance shall be made for any additional costs incurred by the Contractor due to his failure to have examined the site or to have failed to report any discrepancies to the Owner prior to bid.

   2. It is the Contractor's responsibility to be fully familiar with the existing utility locations, conditions and local requirements and regulations.

   3. Verify all measurements and conditions and shall be responsible for the correctness of same. No extra compensation will be allowed because of differences between Work shown on the Drawings and measurements at the site.

E. Any major deviations in location and conduit routing that the Contractor makes without the express written review or direction of the Engineer, shall be considered to have been made at the Contractor's sole responsibility. Such deviations made by the Contractor shall be reflected on the Contractor supplied "Record Drawings." The Owner will reimburse the Engineer and the Owner will then deduct an amount equal to said reimbursement from the Contractor's contract for all engineering, drafting, and clerical expenses associated with updating the Record Drawings due to any major unauthorized changes.

F. The major areas in the scope of work shown on E&I - Series Contract Drawings and Device Index located in Appendix “B” which includes the furnishing and installation:

1. Heather Tank:
    a. Replace existing RTU Panel
    b. Intercept existing conduit and wire to existing level transmitter. Install new pull box. Extend conduit and wire to temporary tanks (level transmitter shall be installed in one tank).
    c. New level transmitter shall be provided for new tank.
2. Larkspur:
    a. Replace existing RTU Panel
    b. Intercept existing conduit and wire to existing level transmitter. Install new pull box. Extend conduit and wire to temporary tanks (level transmitter shall be installed in one tank). Extend conduit and wire to replaced tank.
    c. New level transmitter shall be provided for new tank.
3. Tank 8:
    a. Replace existing RTU Panel
    b. Existing level transmitter will remain monitoring existing tank.
    c. New tank shall be provided with new level transmitter. Existing tank will remain in service until new tank is on-line.
4. Tank 4/5:
    a. Replace existing RTU Panel
    b. Existing level transmitter will remain monitoring existing tank.
    c. New tank shall be provided with new level transmitter. Existing tank will remain in service until new tank is on-line.
5. New Control Panels including Programmable Logic Controller and Operator Interface (OI) hardware for monitoring the tank, and other miscellaneous device. Radio communication back to Central. Reconnect to existing antenna system.
6. Instrumentation and other miscellaneous devices. This includes all wiring and cables.
7. Provide all necessary conduits, junction boxes, grounding system, field interconnection wiring, hardware, fittings, and devices to connect the designated equipment and wiring.
8. Installation of primary devices, equipment and instruments are not completely detailed on Contract Drawing plan sheets. Use Device Indexes and Contract Drawings installation details for installation and mounting requirements.
9. All necessary miscellaneous shut off, sample, and calibration valves to sensors.
10. Trenching, back filling, compaction and resurfacing to match existing surfaces for each underground conduit route.
11. Grounding system and equipment grounding.
12. Concrete pads and supports for electrical and instrumentation equipment
13. Remove and dispose of all excess dirt, paving, concrete, and other materials from site work.

14. PLC programming, and configuration of SCADA system will be by Others.

G. Existing site is limited in space. It is the Contractor's responsibility to provide an electrical and instrumentation package to fit in the allocated space.

H. Provide all necessary hardware, conduit, wiring, fittings, and devices to connect the electrical equipment provided under other Sections.

I. All electrical equipment and materials, including installation and testing, shall conform to the applicable codes and standards listed in this and other Sections. All electrical work shall conform with the National Electric Code (NEC) 2017 issue. Nothing on the Drawings or in the Specifications shall be construed to permit work or materials not conforming to these codes and standards.

J. The following specifications incorporate specific equipment and devices that are standards of the Owner because of their serviceability, because of the local availability of labor, parts and materials, or because of the ability of the Owner to umbrella the equipment under existing maintenance contracts; however, favorable alternatives proposed in writing will be considered by the Owner.

K. Contractor shall field verify all existing conditions, equipment, wires, conduit, etc. as required to complete the project

1.02 CODES AND STANDARDS

A. All electrical/instrumentation equipment and materials, including installation and testing, shall conform to the following applicable codes and standards:

1.	ANSI	-	American National Standards Institute, Inc.
2.	EIA	-	Electronics Industries Association.
3.	ETL	-	Electrical Testing Laboratories.
4.	FM	-	Factory Mutual.
5.	GO128	-	General Order No. 128, Rules for Construction of Underground Electrical Supply and Communication Systems, Public Utilities Commission of the State of California.
6.	IEEE	-	Institute of Electrical and Electronics Engineers.
7.	ICEA	-	Insulated Power Cable Engineers' Association.
8.	ISA	-	International Society of Automation (ISA) Standards (formerly Instrument Society of America.
9.	NEC	-	National Electrical Code, 2020 Edition.
10.	NEMA	-	National Electrical Manufacturers Association.
11.	NETA	-	Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, International Electrical Testing Association.
12.	NESC	-	National Electrical Safety Code.
13.	NFPA	-	National Fire Protection Agency & NFPA820
14.	OSHA	-	Occupational Safety and Health Act Standards.

15. UL - Underwriter's Laboratories, Inc.

B. The revisions of these codes and standards in effect on the date of issuance of the Contract Documents shall apply.

C. Codes and standards referenced shall be considered minimum acceptable work.

D. In instances where two or more codes are at variance, the most restrictive requirements shall apply.

E. All electrical work shall conform with the National Electric Code (NEC) 2020 issue and the latest NFPA 70E. Nothing on the Drawings or in the Specifications shall be construed to permit work or materials not conforming to the preceding codes and standards.

F. All work shall also be performed in accordance with the Owner, State, County or Owner standards, and local Utility codes.

G. The Contractor shall furnish without extra charge any additional material and labor which may be required for compliance with these codes and standards, even though the work is not explicitly mentioned in the Specifications or shown on the Contract E- Series Drawings.

H. Amperage listed on the single-line Drawings for motors are per NEC Table 430.250 and may not necessarily match that of the equipment supplied. It is the electrical system supplier and Contractor’s responsibility to furnish equipment sized for the motors supplied for this project at no additional cost.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Provide electrical system that interfaces to work performed under other Mechanical and Equipment plans.

1.04 ELECTRICAL CONTRACTOR QUALIFICATIONS

A. It is the intent of this Division that the complete responsibility for management and installation of the electrical and instrumentation required for this project be by a qualified Electrical Contractor. This responsibility includes, but not limited to, supervision and coordination of work performed by all suppliers of Division 16.

B. Uncertified electricians shall not perform electrical work for which certification is required per Labor Code Section 3099. Electricians shall be required to carry proof of certification on their person at all times. Electricians found on the jobsite without proof of certification will be asked to leave, prohibited from working on-site until proof of certification has been provided and may be reported to the Contractors State License Board (CSLB).

C. The Electrical Subcontractor shall meet the following minimum qualifications:

1. Has a current C-10 Electrical Subcontractor’s License.
2. Has regularly engaged in similar electrical contracting for the Municipal Water Industry.

3. Has successfully performed work of similar or greater complexity on at least two previous projects under one company name and under the present company name.
4. Has all persons performing work as electricians certified by the California Apprenticeship Council per California Labor Code Section 3099.
5. Has been actively engaged in the type of electrical and instrumentation work specified in this Division for a minimum of two years.

1.05 SYSTEM SUPPLIER QUALIFICATIONS

A. General:

1. It is the intent of this Division that complete responsibility in the supplying of the RTU system, and all instrumentation in Appendix “B” Device Index and other equipment required for this project be supplied by one System Supplier. This responsibility includes, but not limited to, all work necessary to select, furnish, program, supervise installation, calibrate, and place into operation all transmitters, instruments, controllers, alarm equipment, monitoring equipment, and accessories as specified herein.
2. The system supplier shall have an on staff project engineer with prior experience on similar sized projects. This project engineer shall coordinate the technical aspects of this project and prepare the submittals and drawings. The system supplier project engineer shall attend all coordination meetings and be on-site when requested by the Owner’s Engineer.

B. Pre-Qualified System Suppliers

1. The Suppliers listed below have been determined to meet minimum qualifications specified in this Division and are pre-qualified by the Owner for providing supplier bids as system suppliers on the project.
    a. Tesco (phone 916 395-8800)
    b. Technical Systems Inc. (phone 707 678-1111)
    c. Primex Controls (phone 707 449-0341)

C. Non-Pre-Qualified System Suppliers

1. System Suppliers not pre-qualified by the Owner shall submit the information listed herein at least 14 calendar days prior to bid opening, and if approved by the Owner, will be listed in a Contract addendum prior to bid.
    a. Company history.
    b. List of five (5) completed projects of similar size and nature for water treatment plants.
        1) Provide completion dates of projects.
        2) References of Owner Representative in charge of project, including contact name and telephone number.
    c. List of projects in progress.
        1) Description of scope of projects.
        2) Dollar amount of projects.

3) References of Owner Representative in charge of project, including contact name and telephone number.

d. Complete 2020 Year End Financial statement prepared by a Certified Accountant or complete 2020 Company Tax Returns listing assets and liabilities.

2. Factory test for this project shall be held within 150 miles of project location at the System Suppliers shop.

3. Additional information for clarification as requested by the Owner in writing shall be provided by the System Supplier asking for the qualification or qualification will automatically be denied.

4. System Supplier providing financial statements lacking detail or stating that detailed financial records are proprietary will be disqualified as a qualified System Supplier and is grounds alone for disqualification.

5. Any qualification package deemed incomplete or lacking sufficient information to determine qualification will result in System Supplier not being qualified.

6. No reason will be released on why a System Supplier was not qualified.

1.06 CONTRACT DOCUMENTS

A. The Contract drawings and specifications are intended to be descriptive of the type of electrical system to be provided; any error, omission, or minor details missing in either shall not relieve the Contractor from the obligations there under to install in correct detail any and all materials necessary for a complete operational system, at no additional cost.

B. The Contract drawings are generally diagrammatic; exact locations of electrical products shall be verified in the field with the Engineer. Except where special details on drawings are used to illustrate the method of installation of a particular piece or type of equipment or materials, the more restrictive of the two shall take precedence in the event of conflict.

C. The Contract Electrical elementary, elevation and one-line diagrams are the basis of the electrical system to be provided and are for reference only. It is the Contractor's responsibility to adjust and make minor revisions to the diagrams as necessary for operational system at no additional cost to the Owner. Additional isolators, relays, wiring, terminal blocks, and appurtenances, shall be provided for an operation system at no additional cost to the Owner.

D. Location at facilities of new equipment, inserts, anchors, panels, pull boxes, conduits, stub-ups, and fittings for the electrical system are to be determined by the Contractor and Engineer at time of installation. Contractor shall make minor adjustments to locations of electrical equipment required by existing conditions and coordination with other trades at no additional cost.

E. The Conduit and Wire Routing Schedule, wire fill, and number of conduits are based on the best information available.

1. It is the Contractor's responsibility to modify the conduit schedule based upon Shop Drawings for the actual equipment. Such modifications in conduit sizes and numbers of conductors shall be at no additional cost to the Owner, if such changes are the direct result of the equipment selected by the Contractor.

2. A copy of the Conduit and Wire Routing Schedule and Electrical plans showing conduit routing shall be updated weekly by the Contractor. Progress payments will be withheld if during monthly checks it is found that the Contractor fails to maintain the Conduit Schedule updates.

F. Electrical & instrumentation, conduit & wire lengths shown on Contract Drawings are approximate. The Contractor is responsible for determining actual lengths for bidding and installation purposes. Contractor is to be made aware that equipment may be installed in the lower levels of the building and instrumentation manufacturer's cable length depends on conduit routing.

G. The Contractor shall examine the architectural, mechanical, structural, electrical and instrumentation equipment provided under other Sections of this Contract in order to determine the exact routing and final terminations for all conduits and cables. The exact locations and routing of cables and conduits shall be governed by structural conditions, physical interferences, and the physical location of wire terminations on equipment. Conduits shall be stubbed up as near as possible to equipment.

H. All equipment shall be installed and located so that it can be readily accessed for operation and maintenance. The Engineer reserves the right to require minor changes in location of equipment, without incurring any additional costs.

I. Provide means to furnish equipment and accessories, do the installation, complete connections, submit documentation, perform start-up and be responsible for the warranty.

J. Where conduits are shown as “home runs” on the Contract drawings or stated to be furnished, but not explicitly shown as part of the scope of work; the Contractor shall provide all fittings, boxes, wiring, etc., as required for completion of the raceway system, in compliance with the NEC and the applicable specifications in this Section.

K. No changes from the Contract drawings or specifications shall be made without written approval of the Engineer. Should there be a need to deviate from the Contract documents, submit written details and reasons for all changes to the Engineer for favorable review within 30 days after award of Contract.

L. When existing conduits are to be used, it is the Electrical Contractor’s responsibility to verify conduit size and routing. This includes all potholing or other location methods. Existing conductors and conduits damaged by Contractor during construction shall be repaired or replaced at no cost to Owner.

M. The resolution of conflicting interpretation of the Contract documents shall be as determined by the Engineer.

N. The Contractor shall coordinate with other Suppliers on the project for a complete and operable system.

O. It is the System Supplier's responsibility for obtaining instrumentation transmitter configuration software, manuals, USB drives and disks necessary for the Contractor to program and configure the instrumentation transmitters.

P. The Electrical Contractor shall maintain a separate set of neatly and accurately marked set of Record Documents, consisting of spreadsheets, specifications and full size blue-line Electrical (E-Series) and Instrumentation (I-Series) Contract Drawings.

1. These documents are to be used specifically for recording the as built locations and layout of all electrical and instrumentation equipment, routing of raceways, junction and pull boxes, and other diagram or document changes.
2. These Record documents shall be kept up-to-date during the progress of the job, with all "change orders," submittal modifications, and construction changes shown and stamped with “As-Built” at end of job.
3. These Record documents shall not be used for daily construction use and shall not contain any mark-ups that are unrelated to as-built corrections.
4. The following lists the record documents shall be as-built by Electrical Contractor:
    a. E-Series Drawings.
    b. Panelboard schedules.
    c. Conduit and Wire Routing Schedule.
    d. Lighting Schedule.
    e. Duct banks and their routing with offset measurement and indicate changes in depth. Duct bank elevations shall not be drawn or penciled in by hand. Provide CAD drawings of duct banks.
5. The following lists the record documents that shall be as-built by System Supplier to be maintained by Electrical Contractor:
    a. I-Series Drawings
    b. Instrumentation Index.
6. Record documents shall be kept current weekly with all "change orders," submittal modifications, and construction changes shown. Record Documents shall be subject to the inspection by the Engineer at all times, progress payments or portions thereof may be withheld if Record Documents are not accurate or current.
7. When documents are changed, they shall be marked with erasable colored pencils using the following coloring scheme:
    a. Additions - red
    b. Deletions - green
    c. Comments - blue
    d. Dimensions - black
8. Show the following on the Electrical (E-Series) Record Contract Drawings by dimension from readily obtained base lines:
    a. Exact location, type and function of electrical and instrumentation equipment and devices.
    b. Precise routing and locations of underground conduits, pullboxes, junction boxes, and appurtenances that make-up the raceway system.
    c. Show the dimensions, location and routing of electrical work, which will become permanently concealed.

d. Show complete routing and sizing of any significant revisions to the systems shown.

9. Prior to acceptance of the work, the Contractor shall deliver to the Engineer one set of record full size drawings neatly marked accurately showing the information required above.

1.07 COORDINATION

A. The Contractor shall coordinate the electrical work with the other trades, code authorities, utilities, and the Engineer; with due regard to their work, towards promotion of a rapid completion of the project. If any cooperative work must be altered due to lack of proper supervision of such, or failure to make proper provisions, then the Contractor shall bear expense of such changes as necessary to be made in the work of others.

B. Manufacturer's directions and instructions shall be followed in all cases where such is not shown on the Contract Drawings or herein specified.

C. The electrical and instrumentation modifications and additions are to be made at facilities that need to remain powered at all times. The Contractor shall schedule all the required work with the Owner, including each shutdown period. Each shutdown shall be implemented to minimize disruption of the existing operations. Shutdowns may be required outside of normal working hours when necessary. The work to be provided under this Contract shall not disrupt any of the existing operations without prior approval.

1. The Contractor shall limit all scheduled shutdown periods to less than 2 hours (120 minutes) and only with prior approval of the Owner.
2. Carry out scheduled shut downs only after the time, date, and sequence of work proposed to be accomplished during shutdown has been favorably reviewed by the Owner. Submit shutdown schedule and plans at least 10 working days in advance of when the scheduled shutdown is to occur.
3. Contractor shall make provisions for portable generators and automatic transfer switches when facilities will be without power.
4. The Owner reserves the right to delay, change, or modify any shutdown at any time, at no additional cost to the Owner, when the risk of such a shutdown would jeopardize the operation of system.
5. Contractor is advised that during change out of existing MCCs, meter/main, pumps, demolition of existing conduits, installation of new conduits, etc., Contractor is responsible to keep equipment running for all necessary station operation. The Contractor shall install temporary generators, motor controls, panelboards, power panelboards, wiring, etc. to keep all facility equipment powered and automatic controls functional.

D. Contractor shall be responsible for obtaining utility Engineered Drawings for service conductor conduits, pull boxes, wire size requirements, pull rope requirements, etc. Conflicts between the Contract Drawings and the utility engineered drawings shall be brought to the attention of the Engineer.

E. The Contractor shall cease work at any particular point, temporarily, and transfer his operations to such portions of work as directed, when in the judgment of the Owner it is necessary to do so.

F. Prior to commencing construction, the General Contractor shall arrange a conference with the General Contractor, Electrical Contractor, System Supplier, Resident Engineer & Owner as well as all equipment and system suppliers vital to the current phase of work. During the meeting, the equipment supplier shall verify types, sizes, locations, installation requirements, controls and diagrams of all equipment furnished. The Equipment and System Suppliers shall, in writing, inform the Engineer that all phases of coordination of this equipment have been covered and if there are any unusual conditions, they shall be enumerated at this time.

G. It is the responsibility of the Contractor to make all equipment approval arrangements and scheduling with the power utility company connected with this project. Schedule within 30 days after award of contract all service installations and connections with the power and telephone utility. Lack of effort by the Contractor to properly schedule Utility service will not be considered valid justification for delays in project completion and no extension in contract time will be given.

H. The Contractor shall coordinate with Owner, witnessing Engineer and System Supplier to test the entire system.

I. No passwords shall be enabled on software or hardware provided for this project. All electronic disk copies provided to Owner shall not have any password protection enabled on them or the software. Software submitted with password protection will be removed by Owner and the Contractor will be back-charged for the cost thereof.

1.08 SUBMITTAL AND DRAWING REQUIREMENTS

A. General:

1. Submit shop documents and drawings for approval in accordance with this subsection and Section 01300.
2. Electrical submittals shall be submitted for favorable review by the Owner or Engineer per this subsection. They shall be complete giving all details of connections, wiring, instruments, enclosures, materials and dimensions. Standard sales literature will not be acceptable.
3. A copy of the appropriate Division Specification Sections, with addendum updates included and with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
    a. Check marks (√) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated and, therefore, requested by the Contractor, each deviation shall be underlined and denoted by a unique number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the Specifications.

b. The submittal shall be accompanied by a detailed, written justification for each numbered item explaining variance or non-compliance with specifications.

c. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no review.

4. The Contractor shall coordinate submittals and required meetings with the work, panel fabrication and factory tests so that project will not be delayed. This coordination shall include scheduling the different categories of submittal, so that one will not be delayed for lack of coordination with another.

5. No material or equipment shall be allowed at the job site until the submittal for such items has been reviewed by the Engineer and marked “No Exceptions Taken” or “Make Corrections Noted.”

6. The equipment specifications have prepared on the basis of the equipment first named in the Specifications. The Supplier shall note that the second named equipment, if given, is considered acceptable and equal equipment, but in some cases additional design, options, or modifications may be required, at no additional cost, to meet Specifications.

7. The decision of the Engineer governs what is acceptable as a substitution. If the Engineer considers it necessary, tests to determine equality of the proposed substitution shall be made, at the Contractor’s expense, by an unbiased laboratory that is satisfactory to the Engineer.

8. The Contractor shall cease work at any particular point, temporarily, and transfer his operations to such portions of work as directed, when in the judgment of the Engineer it is necessary to do so.

9. No submittal documents shall be labeled as proprietary. Labeling documents as proprietary will be sufficient cause for rejection of entire submittal. The Owner reserves the right to copy or duplicate any and all portions of the documents provided for the project including copyrighted documents as desired.

10. Approval of submittals shall not relieve Contractor of their obligation to perform the work in strict accordance with this Contract and the Contract Documents or of their responsibility to provide a complete and reliable system.

11. Identify all submittals by submittal number on letter of transmittal. Submittals shall be numbered consecutively and resubmittals shall have a letter suffix. For example:

    a. 1st submittal: 1

    b. 1st resubmittal: 1A

    c. 2nd resubmittal: 1B, etc.

B. The electrical submittals shall include but not be limited to data sheets and drawings for each product together with the technical bulletin or brochure. No FAX copies of documents are allowed. Color copies shall be provided when black and white copies do not show adequate clarity. The electrical submittals shall include:

1. Product (item) name used herein and on the Contract Drawings.

2. The manufacturer’s model or other designation.

3. Tag name/number per the P&ID drawings, schedules, and indexes.
4. Index Binder Tab Dividers.
5. Detailed electrical one line, elementary control diagrams and interconnection diagrams showing all wiring requirements for each system.
6. Complete documentation with full description of operation.
7. Complete catalog cuts with full description of equipment. General sales literature will not be acceptable. The part or model number with options to be provided shall be clearly identified. Where more than one item or catalog number appears on a catalog cut, the specific item(s) or catalog numbers(s) proposed shall be clearly identified.
8. Location of assembly at which it is installed.
9. Input-output characteristics.
10. Range, size and graduations as required.
11. Physical size with dimensions and mounting details. System Supplier submit a letter listing all instrumentation pipe sizes, pipe connections, flange types, and ANSI ratings signed by Contractor and System Supplier to certify coordination for proper installation prior to flow elements being purchased.
12. Enclosure fabrication and color.
13. Enclosure layout and elevation drawings to scale.
14. Quantity and quality requirements for electric power.
15. Materials of construction of components.
16. Nameplate schedule.
17. Interconnection diagrams.
18. Failure to provide submittals with heavy duty permanent plastic labeled index tabs may be grounds for immediate rejection without review.
19. Bill of Materials: A complete Bill of Materials list shall be provided at the inside of the front cover. The Contractor shall provide Bill of Material for electrical components formatted as shown in Appendix "A". A separate set of Material Listing forms shall be provided for the MCC, spare parts, and another listing all field equipment. Generic names or part numbers used by a distributor or Systems House are not acceptable; originating manufacturer’s name and part number shall be listed.
20. A separate instrument data sheet shall be provided for each instrument per ISA S20 standards or approved equal. Data sheets shall be printed on blue or pink paper. Provide an index with proper identification and cross-referencing of each data sheet.
21. Submit USB electronic copies of all submitted drawing in AutoCAD format.
22. For each resubmittal, provide a copy of submittal comments and a separate letter, on Company letterhead, identifying how each submittal comment has been addressed in the resubmittal.
23. Electronic PDF version of submittals shall follow hard copy format of submittal and shall be “bookmarked” at each index, subtab, copy of appropriate check-marked Specification Section, bill of materials, copy of submittal comments (for resubmittals),

Contractor's response to submittal comments (for resubmittals), drawings, etc. Failure to bookmark PDF may be grounds for immediate rejection without review.

24. Submittal Drawings shall be provided in 11 inch by 17 inch hardcopy format.
25. Electronic submissions of submittals may be provided for submittals less than 80 pages and without drawings. Submittals equal to or over 80 pages or those that contain drawings shall be provided in a hardcopy format. Drawings shall be printed at 11 inches by 17 inches. Hardcopy submittals shall be provided in binders as specified herein. The Owner reserves the right to reject submittals that fail to be organized as described herein.

C. Drawings:

1. General:
    a. All drawings shall be generated with a computer utilizing the AutoCAD 2010 or later drafting package. Standard preprinted drawings simply marked to indicate applicability to the Contract will not be acceptable. Drawings shall be prepared in a professional manner and shall have borders and a title block identifying the project, system, drawing number, drawing title, AutoCAD file name, project engineer, date, revisions, and type of drawing. Drawings shall be no smaller than 11" x 17" and printed with a laser jet printer or plotted in ink on vellum. The lettering shall be legible and no smaller than 0.075 inch in height.
    b. Diagrams shall carry a uniform and coordinated set of wire colors, wire numbers, and terminal block numbers.
    c. A Drawing Index shall be provided that lists each Drawing title and drawing number.
    d. Each Drawing title and number shall be unique. The index shall not include drawings listed as "This Page Intentionally Left Blank".
    e. The shop drawings shall include drawings described herein.
2. Electrical one or three line diagrams detailing all devices associated with the power distribution system. The following applicable information or data shall be shown on the one- or three- line diagram: location, size and amperage rating of bus; size and amperage rating of wire or cable; breaker ratings, number of poles, and frame sizes; generator; automatic transfer switch; utility metering; voltage; amperage; number of wires and phases; fault interrupt ratings; ground size and connections; neutral size and connections; power fail and other protective devices; fuse size and type; panelboard; starters; contactor size and overload range; motor full load amperage of submitted motor and horsepower; rating for miscellaneous loads; etc. Submit equipment motor voltage, phase and full load amps provided for this project for verification of accuracy of submitted one line drawings.
3. Elementary diagrams shall be provided for all relay logic, power supplies, PLC I/O and other wiring. All elementary diagrams shall be drawn in JIC EMP/EGP format and standards similar to those shown on the E-series elementary diagrams showing ladder rung numbers and coil and contact cross referencing numbers.
4. Analog and digital PLC I/O wiring diagrams shall be provided showing the wiring requirements for each instrument loop. Graphic symbols shall conform with ISA S5.4 drawing standards. A loop diagram shall be furnished for each analog and digital I/O

process and all PLC I/O points. Loop diagrams shall include the following as a minimum:

a. The loop diagram shall be drawn with sufficient detail to express control philosophy. The diagram shall show all components and accessories of the instrument loop, highlighting special safety and other requirements. These diagrams shall be arranged to emphasize device elements and their functions as an aid to understanding the operation of a system and for maintaining or troubleshooting that system.

b. Analog and digital I/O shall be arranged on the diagram in the same order as the physical arrangement of the group terminations. All termination points on the diagram shall be shown with the actual equipment identification, device and relay terminal number or letter, and I/O point P&ID English descriptor and tag name.

c. A separate drawing shall be prepared for each analog and digital card. Each card shall be arranged on the diagram in the same order as the physical arrangement of the card terminations.

d. Energy sources – electrical power, air supply, pneumatic and hydraulic fluid supply, designating voltage, current, pressure, etc. shall be shown in detail on the diagram. Input and output signals (e.g., 1-5 VDC, 4-20 mA DC, 3-15 psig, etc.), power and instrument supplies to devices (e.g. 120 VAC, 24 VDC, 80 psig, etc.) shall be shown.

e. Engineering units shall be shown on the diagram. Each wire label, equipment identification terminal number or letter and color code shall be shown. Signal and DC polarities shall be shown.

f. All spare wires, cables and termination points shall be shown. All jumpers, grounding, shielding, power supply details shall be shown.

5. Enclosure and Elevation layout diagrams shall be provided to show all deadfront, front panel and backpan devices drawn to scale. Show fabrication methods and details; including material of construction, paint color, support and latching mechanisms, fans and ventilation system, and conduit entrance areas.

6. Interconnection diagrams shall show for each piece of equipment all wiring between all devices, panels, cabinets, terminal boxes, control equipment, motor control centers and any other devices and equipment. An interconnection diagram shall be furnished for each electrical and instrumentation system, even if one was not shown explicitly on the Contract Drawings. Interconnection diagrams shall be prepared for all conduits listed in the Conduit and Wire Routing Schedule. Each interconnection diagram shall show the following as a minimum:

   a. Interconnect drawings shall be prepared for all equipment by the System Supplier.

   b. The diagrams shall be utilized by the electrician during all phases of installation and connection of all conductors to ensure coordination of equipment interconnect.

   c. The diagrams shall show wiring as field labeled at the end of the project when as-builts are submitted.

   d. Each wire labeling code as actually installed shall be shown. The wiring labeling code for each end of the same wire must be identical.

   e. All devices and equipment labeling codes shall be shown.

   f. All Interconnection wires listed in the Conduit and Wire Routing Schedule for each conduit shall be shown only on one interconnect drawing. Interconnection

diagrams shall be of the continuous line type with identified lines. Diagrams of the wireless or wire schedule type are not acceptable. Bundled wires shall be shown as a single line with the direction of entry/exit of individual wires clearly shown.

g. All terminations points on the diagram shall be shown with the actual equipment identification terminal number or letter. This identification of terminations includes terminal blocks, junction boxes, all devices, computer I/O points, etc. “??” in lieu of terminal number is unacceptable.

h. Diagrams shall include raceway numbers, raceway size, raceway type, cable numbers, wire color code, and wire numbers.

i. Each wire size, and cable size and color code shall be shown. Each conduit with the conduit label and conduit size and wire fill shall be shown. Wire and cable routing through conduits, wireways, manholes, handholes, junction boxes, terminal boxes and other electrical enclosures shall be shown with the appropriate equipment labels. All spare wires, cable, and termination points shall be shown. Cable shields shall be shown.

j. Labeling codes for terminal blocks, terminals, wires, cables, panels, cabinets, instruments, devices, and equipment shall be shown. Place “øA,” “øB,” and “øC” label next to each breaker to identify phase connected to.

k. Schematic symbols shall be used for field devices, showing electrical contacts. Signal and DC circuit polarities shall be shown.

l. The diagrams shall show all other Contract and Supplier drawing numbers, for reference, that are associated with each device that is interconnected. Attached to each interconnect, a copy of all the support documents used in preparing interconnects shall be submitted. This includes current issues of panel schematics, elementary diagrams, panelboard schedules, conduit schedules, one-line diagrams, connection diagrams, terminal block diagrams, submittals, contract drawings, vendor drawings and all other data used to develop the interconnection diagram as noted in the “Reference Documents” corner of Interconnect Drawings.

m. Interconnects shall include list of all applicable reference drawings, request for clarifications, field instructions and change orders. All deletions and additions of equipment, wire and cables shall be clearly shown.

n. Field wiring shall not start before the Interconnection Drawing has been submitted by the Contractor and approved by the Owner.

o. Do not show the same wires or jumpers, or panel wiring on both the connection and interconnection diagrams. All jumper, shielding, and grounding termination details not shown on the connection diagrams shall be shown on the interconnection diagrams.

p. Interconnection diagrams shall be submitted and approved by Owner for each electrical and instrumentation system. The Contractor shall not pull in any wires into conduits that do not have approved interconnects. If the Contractor pulls in wire without Owner approval of associated Interconnect Drawings, the Contractor will not be reimbursed for labor for re-pulling in wires even if there was an error in wire fill or sizing. Also, if the Contractor pulls in wire without Owner approval of associated Interconnect Drawings, then all progress payments related to field wiring for that particular area of work will be withheld until approved Interconnect Drawings are in use.

q. All interconnection diagrams shall be prepared by a System Supplier under the supervision of or by a State of California Registered Electrical Engineer and shall bear that Engineer's professional stamp and signature for all Interconnection Drawings submitted for approval including as-builts and those used in the field installation.

r. Example format of Interconnection diagram is shown on Contract "E" Series Drawings or may be obtained from the Engineer.

s. Interconnect drawings submitted with wiring of a single conduit run separated onto multiple interconnect drawings will be rejected without review. A single conduit run with wiring shown on separate interconnect drawings will be allowed only after written approval is given by the Engineer for each conduit run prior to submitting the associated interconnect drawings.

t. Only field wiring between MCC, Panelboards, Control Panels, and other electrical and instrumentation devices or equipment shall be shown on interconnection drawings. No internal panel wiring shall be shown on interconnect drawings except jumper or other wiring to be installed in field by Electrical Contractor.

u. Interconnect Drawings along with the corresponding support documents shall be submitted in a separate submittal package. Interconnect drawings submitted with non-interconnect drawing packages will be rejected.

v. Interconnect drawings shall be prepared for all equipment by the System Supplier with the exception of the Telephone System and Security Alarm System who shall produce their own interconnect drawings.

w. Provide a notes section on each interconnect drawing. In the note section, list any variances from the Contract conduit schedule necessary for completing the interconnections. Change orders regarding wire fill, conduit schedule and errors in plans regarding conduits and wires will not be processed until interconnect drawings have been received for such work.

x. The field electrician shall mark-up all interconnection diagrams during installation to show accurate as-built wiring, conduits runs, terminations, etc. If interconnection drawings are not properly as-built, the Electrical Contractor will have cost deducted from the Contract for the Owner to field verify and prepare as-built interconnection drawings amount. The amount of the deduction shall be determined on a time and material basis. The cost of such work shall be $120.00 per hour plus expenses.

y. The System Supplier shall be responsible to collect all information necessary to complete each interconnection drawing. This includes making field trips to collect all terminal connection data for new and existing, MCCs, switchboards, panelboards, instruments, equipment and electrical panels.

z. An index of drawings shall be provided with each Interconnection submittal listing the unique drawing number and the description of the interconnect drawing (e.g. Drawing 4321-IC1004 Pump 1004 Interconnect Drawing).

aa. Provide conduit and interconnect drawing cross reference indexes. Interconnect Conduit Index shall list all conduits listed in the Conduit & Wire Routing schedule and its associated Interconnection Drawing number. An Interconnection Drawing Index shall list all Interconnection drawings and the conduits shown on that specific drawing. These two indexes shall be at the front of all interconnection drawing submittals.

bb. Interconnection submittals that contain more than two motor control panels/centers shall have heavy duty dividers with permanent plastic labeled index tabs separating each group of drawings.

7. Submit full size drawing of all nameplates and tags, as specified herein, to be used on project. The Engineer has the right to adjust nameplate engraving titles during submittals at no additional cost to the Owner. Submittal to include the following:
   a. Dimensions of nameplate.
   b. Exact lettering and font for each nameplate.
   c. Color of nameplate.
   d. Color of lettering.
   e. Materials of construction.
   f. Method and materials for attachment.
   g. Drawing showing location of nameplates on each panel and enclosure.
8. Copying contract drawings and providing them as submittals will be considered unresponsive and the submittal will be rejected without review.

D. Each submittal shall be bound in a three ring binder, which is sized such that when all material is inserted the binder is not over 3/4 full. Binder construction shall allow easy removal of any page without complete manual disassembly; spiral ring type binders are not acceptable.
   1. Each binder shall be appropriately labeled on the outside spine & front cover with the project name, contract number, equipment supplier's name, specification section(s), and major material contained therein.
   2. An index shall be provided at the inside of the front cover. This index shall itemize the contents of each tab and subtab section. Also list the project name, contract number and equipment supplier's name, address, phone number, and contact person on the index page.
   3. Field equipment shop documents, panel equipment shop documents, drawings, and bill of materials shall be grouped under separate tabs. Catalog cuts shall be ordered in the same sequence as their corresponding Contract specification subsection.
   4. All copies shall be clear and legible. Data sheets shall be provided for each instrument, with an index and proper identification and cross-referencing.
   5. Exceptions to the Contract specifications or drawings shall be clearly defined by the equipment supplier.
      a. Data shall contain sufficient details so a proper evaluation may be made by the Engineer. Contractor shall provide separate letter (located in the front of the submittal) detailing specific exceptions to the Contract Specifications or Drawings.
      b. Exceptions that are noted in the marked-up Drawings or Specifications, but not listed on the Exceptions/Clarifications letter, will be considered as non-responsive and not accepted as changes to the Contract Documents.
   6. Requests for information (RFIs) shall not be included in submittals. RFIs supplied with submittals will not be answered. RFIs shall be submitted following proper channels.

7. Resubmittals shall be provided with a copy of the previous submittal comments and a separate letter, on company letterhead, identifying how each submittal comment has been addressed in the resubmittal.
8. Drawings shall be submitted in a separate hole-punched binder that covers the entire 11” x 17” length of the Drawing:
    a. Shop Drawings with less than 20 sheets total in the submittal, may be provided in an 11½-inch by 17½-inch reinforced folder.
    b. All Interconnection Drawings or Shop Drawings of 20 sheets or more shall be provided in separate heavy duty three-ring binder to allow drawings to be easily removed. Binder shall be Cardinal D-Ring Easy Open Ledger Binder with locking D-Rings or approved equal.
    c. Failure to provide drawing submittal in correct binder format may be grounds for immediate rejection without review.
    d. Each drawing title block shall contain the English description name for drawing contents (i.e. Lift Pump No. 1 Interconnect Drawing) and drawing number. All pages and drawings in the submittal shall be numbered sequentially (with no number skipped) in lower right hand corner.
    e. Drawings that are "C" or "D" size shall be folded, with the title block visible and placed in reinforced clear plastic pockets.

E. Shop documents and drawings shall be submitted for all devices and components in the electrical system. The Contractor is notified that this is a “Fast Track” project and all electrical & instrumentation drawings shall be submitted in a timely manner as not to delay completion of the project.

1.09 SUPERVISION

A. The Contractor shall schedule all activities, manage all technical aspects of the project and attend all project meetings associated with this Section.

B. The Contractor shall supervise all work in this Division, including the electrical system general construction work, from the beginning to completion and final acceptance.

C. The Contractor shall supervise and coordinate all work in this Division to insure that each phase of the project, submittal, delivery, installation, and acceptance testing, etc., is completed within the allowable scheduled time frames.

D. The Contractor shall be responsible for obtaining, preparing, completing, and furnishing all paper work for this Section, which shall include transmittals, submittal, forms, documents, manuals, instructions, and procedures.

1.10 INSPECTIONS

A. All work or materials covered by the Contract documents shall be subject to inspection at any and all times by the Owner. If any material does not conform to the Contract documents, or does not have an “No Exceptions Taken” or “Make correction Noted” submittal status; then the Contractor shall, within three days after being notified by the

Owner, remove the unacceptable material from the premises; and if said material has been installed, the entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the Contractor.

B. The Contractor shall give the Owner 10 working days' notice of the dates and time for inspection. Date of inspection shall be as agreed upon by both the Contractor and Owner.

C. Work shall not be closed in or covered over before inspection and approval by the Owner. All costs associated with uncovering and making repairs where non-inspected work has been performed shall be borne by the Contractor.

D. The Contractor shall cooperate with the Owner and provide assistance for the inspection of the electrical system under this Contract. The Electrical Contractor shall remove covers, provide access, operate equipment, and perform other reasonable work which, in the opinion of the Engineer, will be necessary to determine the quality and adequacy of the work.

E. Before request for final inspection is made, the Contractor shall submit to the Owner in writing, a statement that the Contractor has made his own thorough inspection of the entire project enumerating punch list items not complete and that the installation and testing is complete and in conformance with the requirements of this Division.

F. The Owner may arrange for a facility inspection by Cal-OSHA Consultation Service at any time. The Contractor shall make the necessary corrections to bring all work in conformance with Cal-OSHA requirements, all at no additional cost to the Owner.

G. Contractor will be Responsible for any Additional Cost for Overtime, Weekend Overtime or Differential Time, Expenses for Inspection of Defective Work that has to be re-inspected.

1.11 JOB CONDITIONS

A. The Contractor shall make all arrangements and pay the costs thereof for temporary services required during construction of the project, such as temporary electrical power and telephone service. Upon completion of the project, remove all temporary services, equipment, material and wiring from each site as the property of the Contractor.

B. The Contractor shall provide adequate protection for all equipment and materials during shipment, storage and construction. Equipment and materials shall be completely covered with two layers of plastic and set on cribbing six inches above grade so that they are protected from weather, wind, dust, water, or construction operations. Equipment shall not be stored outdoors without the approval of the Owner. Where equipment is stored or installed in moist areas, such as unheated buildings, provide an acceptable means to prevent moisture damage, such as a uniformly distributed heat source to prevent condensation.

C. The elevation of the project site is shown on Contract Civil Drawings. All equipment shall be derated, as recommended by the manufacturer or in accordance with ANSI C37.30.

D. The normal outdoor, not in direct sunlight, ambient temperature range of the job site will vary between 0 to 110 degrees Fahrenheit. All equipment shall be rated to operate in these temperature ranges or provisions for adequate heating and cooling shall be installed, at no additional cost to Owner. Provide air conditioning on outdoor electrical panels with heat sensitive equipment to meeting this requirement.

E. The jobsite is prone to vandalism and theft. Contractor shall be responsible for securing all materials and equipment against theft and vandalism for the duration of the project.

F. Contractor & Subcontractors shall utilize temporary services during construction of the project. No Contractors shall utilize building power, receptacles, etc. during construction.

1.12 MEASUREMENT AND PAYMENT

A. No measurement will be made. Full compensation for conforming to these requirements, including all the labor, materials, tools, equipment, incidentals and for doing all the work involved in this section necessary for completion of the work, as shown on the Contract Plans, as specified in the Standard Specifications, these special provisions and as directed by the Engineer, shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed.

1.13 CHANGE ORDER PRICING

A. All change order pricing by Contractor or System Supplier shall be broken out into the following minimum categories:

   1. Labor per hour listed per discipline, i.e. Engineer, Drafter, Estimator, Programmer, Secretarial, etc.
   2. Materials and equipment itemized per component and quantity.
   3. Rentals, travel, per Diem, etc.
   4. Tax.
   5. Shipping.
   6. Overhead and profit.

B. Lump sum change order pricing is not acceptable.

C. If Contractor or System Supplier refuse to provide a change order with broken out pricing, the Engineer reserves the right to obtain independent estimates from other Contractors or System Suppliers. The Contractor or System Supplier who refused to provide the change order with broken out pricing, will be charged for the preparation of the independent estimates.

PART 2 - MATERIALS

2.01 QUALITY

A. It is the intent of the Contract specifications and drawings to secure the highest quality in all materials and equipment in order to facilitate operation and maintenance of the facility. All equipment and materials shall be new and the products of reputable suppliers having adequate experience in the manufacture of these particular items. For uniformity, only one manufacturer will be accepted for each type of product.

B. All equipment shall be designed for the service intended and shall be of rugged construction, of ample strength for all stresses which may occur during fabrication, transportation, erection, and continuous or intermittent operation. All equipment shall be adequately stayed and braced and anchored and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details. All components and devices installed shall be standard items of industrial grade, unless otherwise noted, and shall be of sturdy and durable construction suitable for long, trouble free service. Light duty, fragile and competitive grade devices of doubtful durability shall not be used.

C. Products that are specified by manufacturer, trade name or catalog number established a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are favorably reviewed by the Engineer prior to installation.

D. Underwriters Laboratories (UL) listing is required for all substituted equipment when such a listing is available for the first named equipment.

E. When required by the Contract specifications or requested by the Engineer, the Contractor shall submit equipment or material samples for test or evaluation. The samples shall be furnished with information as to their source and prepared in such quantities and sizes as may be required for proper examination and tests, with all freight and charges prepaid. All samples shall be submitted before shipment of the equipment or material to the job site and in ample time to permit the making of proper tests, analyses, examinations, rejections, and resubmissions before incorporated into the work.

F. All equipment shall be designed and constructed so that in the event of a power interruption, the equipment specified hereunder shall resume normal operation without manual resetting or operator interaction when power is restored.

G. Signal transmission from remote or field electric and electronic devices shall be 4-20 mA, sourced by a 24 VDC loop supply from the panel that is to receive the signal. Nonstandard transmission methods such as impulse duration, pulse rate, and voltage regulated will not be permitted except where specifically noted.

H. Outputs of equipment that are not of the standard signals as outlined, shall have the output immediately raised and/or converted to compatible standard signals for remote transmission.

I. It is the System Supplier's responsibility to visit jobsite to collect and document existing conditions and equipment device part numbers in order for all similar called out new equipment to match existing.

2.02 NAMEPLATES AND TAGS

A. EQUIPMENT EXTERIOR NAMEPLATES: Nameplate material shall be rigid laminated black phenolic with beveled edges and white lettering, except for caution, warning, and danger nameplates the color shall be red with white lettering. The size of the nameplate shall be as shown on the Drawings. No letters are allowed smaller than 3/16". All phenolic nameplates located outdoors shall be UV resistant. Securely fasten nameplates in place using two 316 stainless steel screws if the nameplate is not an integral part of the device. Epoxy cement or glued on nameplates will not be acceptable.

1. Each major piece of electrical equipment shall have a manufacturer's nameplate showing the Contract specified name and number designation, the manufacturer's name, model designation, part number, serial number, and pertinent ratings such as voltage, amperage, # of phases, range, calibration, etc.
2. For each device with a specific identity (pushbutton, indicator, field control station, disconnect switches, etc.) mounted on the exterior or deadfront of a piece of equipment, provide a nameplate with the inscription as shown in the Contract Documents. Where no inscription is indicated in the Contract Documents, furnish nameplates with an appropriate inscription providing the name and number of device.
3. For all receptacles and switches (including devices located on Switchboard or MCC), provide a faceplate engraved or stamped with the panelboard and circuit number it is fed from. Also, include on faceplate or on a separate nameplate for each light switch identification use such as "OUTSIDE BUILDING LIGHTS," "PERIMETER LIGHTS," "MCC ROOM," etc.
4. All field instruments and devices shall be labeled with designation shown on P&ID diagrams.
5. All transformers and panelboards shall have nameplates with ½" high letters and be engraved with designations as shown on one-line Drawings.
6. All safety and disconnect switches shall have nameplates with ½" high letters and be engraved with designations as shown on one-line drawings.
7. Underground Pull Box and Vault Cover Identification: Engrave or bead weld pull box covers with minimum 1/4"thickness and 1/2" letters and covers shall be engraved with designations as shown on Contract drawings or as directed by Owner.
8. Aboveground Pull Box Cover Identification: 316 stainless steel screws attached stamped 316 stainless steel plate nameplates with 1/2" letters and be engraved with designations as shown on Contract drawings or as directed by Owner.
9. Provide engraved nameplate at service entrance equipment (red with white lettering) indicating type and location of standby generator per NEC 702.7 (A).
10. Provide engraved nameplate at service entrance equipment per NEC 702.7(B)
11. METERING – Service Equipment Label: Per NEC 110.24 (A) Service equipment shall be legibly marked in field with the maximum available fault current. Field marking shall

include date the fault current calculation was performed and be weather & UV rated. Service equipment shall not be hand labeled.

12. All subpanels shall be identified with an engraved phenolic label of the power source location feeding it (i.e. MCC-100, Panelboard LP-1, etc.)
13. Specific equipment fed from more than one feeder shall be properly identified ("Fed from Pedestal and the standby generator").

B. EQUIPMENT INTERIOR NAMEPLATES: Nameplate material shall be white plastic with black machine printed lettering as produced by a KROY or similar machine; except caution, warning, and danger nameplates shall have red lettering.

1. The size of the nameplate tape shall be no smaller than ½" in height with 3/8" lettering unless otherwise approved by the Engineer. Securely fasten nameplates in place on a clean surface using the adhesion of the tape. Add additional clear adhesive to hold the nameplate securely in place when necessary.
2. For each device with a specific identity (relay, module, power supply, fuse, terminal block, etc.) mounted in the interior of a piece of equipment provide a nameplate located above the device with the inscription as shown in the Contract Documents. Where no inscription is indicated in the Contract documents, furnish nameplates with an appropriate inscription providing the name and number of device used on the Submittal Drawings. Stamp the nameplates with the inscriptions as approved by the Engineer in the submittal.
3. Nameplates shall not be attached to wireway covers or to removable devices.
4. For all receptacles and switches (including devices located in Control Panel, provide a faceplate printed with the panelboard and circuit number it is fed from.

C. EQUIPMENT TAGS: The Contractor shall attach a tag to the equipment (including instruments) with the same inscriptions as specified above in paragraph A. The tag shall be made from 316 stainless steel material and the size of the nameplate shall be no smaller than 3/8"h x 2"w with 3/16" machine printed or engraved lettering unless otherwise approved by the Engineer. The tag shall be attached to the equipment with 316 stainless steel wire of the type normally used for this purpose. SST wire must be crimp connected. Twisting ends together is not acceptable.

D. Engrave or machine print the tags with inscriptions as approved by the Engineer in the nameplate submittal.

E. Provide temporary labels for all instruments and devices immediately when installed. Temporary labels shall be provided with ½" letters minimum and labeled with P&ID tag number.

2.03 WIRE

A. This Section applies to all wires or conductors used internal for all electrical equipment or external for field wiring. All wires shall be properly fused or protected by a breaker at the amperage rating allowed by the NEC.

B. Material: Wire shall be new, plainly marked with UL label, gauge, voltage, type of insulation, and manufacturer's name. All wire shall conform to the following:

1. Conductors shall be copper, with a minimum of 97% conductivity.
2. Wire shall be Class B stranded. Solid wire conductor prohibited.
3. ASTM B8, soft drawn copper, maximum 12 months old.
4. Insulation of all conductors and cables shall be rated 600 volt.
5. Insulation type for all conductors shall be moisture and heat resistant thermoplastic NEC Type XHHW-, rated 90 °C in dry locations and 75 °C in wet locations, or approved equal.
6. Field wire minimum AWG sizes
    a. #12 for wires used for individual conductor circuits 480 volt and above. #12 for wires used for individual conductor circuits 100 volt and above, except for PLC I/O which may be #14 AWG.
    b. #14 for wires used for individual conductor circuits below 100 volt.
7. Non-field or panel wire minimum AWG sizes if properly protected by fuse or breaker:
    a. #14 for wires used for individual conductor circuits 100 volt and above.
    b. #18 for wires used for individual conductor circuits below 100 volt and above if properly protected by fuse or breaker.
8. Instrument Wiring
    a. Field: Instrument cables shall have 600V tray cable rated insulation and 100% individual shielded twisted pair #16 conductors with drain wire. Single twisted shielded pair (T.S.P.R.) Cables shall be Belden, Manhattan, or approved equal.
    b. Non-Field: Instrument cables shall have 300V rated insulation and 100% individual shielded twisted pair #18 conductors with drain wire. Single twisted shielded pair (T.S.P.R.) cables shall be Belden, Manhattan, or approved equal.
    c. General: Instrument cables shall have 600V rated insulation and 100% individual shielded twisted pair #16 conductors with drain wire. Single twisted shielded pair (T.S.PR.) cables shall be Belden, or approved equal.

C. Wire Marking

1. Wire Identification: All wire terminations including field interconnect as well as wiring interior MCC cubicles, switchboard, panels, equipment, junction panels and boxes shall be identified with machine printed labels. Hand lettered labels are not acceptable and shall be replaced at the Contractor's expense. The wire identification code for all field interconnect and panel interior wiring, shall be similar to the designations shown on the Contract example drawings.
2. Wire Labels: The labels shall be machine printed with indelible ink, heat-shrink type, capable of accepting a minimum of 23 machine printed characters per sleeve, label by Brady "Bradysleeve" or equal. Labeling shall be neatly installed for visibility and shall be clearly legible. Each wire and conductor shall be labeled with wire label, as shown on approved loop, elementary and interconnect Drawings. Labels shall not be wrap-around or Snap-On type.

3. Where there is insufficient space for labels on locally interconnected neutral wires such as jumpers between adjacent auxiliary relay coil neutral terminals, these labels may be omitted. “Locally” is defined as wires no longer than 8”.
4. Wire labels for lighting and receptacles shall be installed and consist of the panelboard and circuit number (i.e., Panelboard “LP100,” circuit breaker #3 would have wire label line “LP100-L3” and neutral “LP100-N3”).
5. All spare wires shall be labeled with equipment number followed by X1, X2, etc. (i.e. P11001-X1 for first spare wire).
6. All control and signal wiring terminations shall have the correct wire label applied prior to making connection.
7. Ethernet patch cables and fiber cables shall be labeled with primary devices it is connected to (i.e. “PLC,” “OI,” “PLC-2,” etc.). Label shall be white plastic with black machine printed lettering as produced by a KROY or similar machine with lettering no smaller than 3/8”. Securely attach to cable with clear tape.

D. Special Purpose Wiring

1. Manufacturer Supplied Cables (MNFR CBL): Cables and wiring for special systems shall be provided by the manufacturer with the equipment and installed per the manufacturer’s recommendations.

E. Color Code

1. Color code of all wire shall conform with the following table.

WIRES COLOR CODE TABLE

Description	Phase/Code Letter	Field Wire or Tape Color	Non-Field Wire Color
480 V, 3 Phase	A	Brown	Brown
	B	Orange	Orange
	C	Yellow	Yellow
240 V or	A	Black	–
208 V, 3P	B	Red (Orange if high leg)	–
	C	Blue	–
240 / 120 V, 1 P	L1	Black	Black
	L2	Red	–
24 V Positive	24P	Blue	Blue
24 V Negative	24N	Blue/White	Blue/White
AC Control		Violet	Red (Yellow for Foreign Circuits)
DC Control		Blue	Blue
Neutral	N	White	White
Ground	G	Green	Green
Shielded Pair	+	Red	Red
	–	Black	Black

2. No other colors shall be used without prior approval of the Owner.
3. The same color shall be connected to the same phase throughout the panel.
4. All wires shall be properly fused or protected by a breaker at the amperage rating allowed by the NEC.
5. Neutral used for AC Control shall be white.
6. Phase color insulation shall be provided for complete length of #8 wire or smaller, colored phase tape is not allowed on #8 and smaller wire.

2.04 TERMINAL BLOCKS & FUSES

A. Control Panel Terminal Blocks:

1. General
    a. Terminal blocks to be clamp type, 6mm spacing, 600 volt, minimum rating of 30 amps, and mounted on DIN rail, Entrelec, Weidemuller or approved equal. DIN rail shall be same type as used for the relays. Install an extra DIN rail on each type of terminal strip with 20% spare terminals for future additions.
    b. Provide terminal blocks with "follower" plates that compress the wires and have wire guide tangs for ease of maintenance. Terminal blocks that compress the wires with direct screw compression are unacceptable. All power, control and instrument wires entering and leaving a compartment shall terminate on terminal blocks with wire numbers on terminals and on both ends of the wires.
    c. Terminal Tags and Markers: Each terminal strip shall have a unique identifying alphanumeric code at one end. Numbers shall be assigned to all blocks except grounding blocks. Fuse blocks shall be assigned unique tag numbers such as FU1, FU2. No two fuses shall be assigned the same tag number. Terminal blocks are to be labeled to match the wire landed.
    d. Terminal blocks shall be physically separated into groups by the level of signal and voltage served. Power and control wiring above 100 volts shall have a separate group of terminal blocks from terminal blocks for wiring below 100 volts, intermixing of these two types of wiring on the same group of terminal blocks is not allowed.
    e. Provide a ground terminal or connection point for each grounding conductor.
    f. Provide a separate terminal block for every two neutral terminations or as coordinated with the interconnect diagrams.
2. MCC – Motor Starter Cubicles Terminal Blocks:
    a. MCC cubicle terminal blocks shall be pull-apart as supplied standard by MCC manufacturer.
3. Power Termination Blocks shall be rated for 600V main power connection. The power termination blocks shall be rated to accept Copper or Aluminum cable rated as shown on Contract one-line diagrams. The power termination block shall be capable of being mounted anywhere in a termination box. Each termination block shall be provided with lug shield to prevent contact with power connections. The power termination blocks shall be Connectron or approved equal.

B. Fuses

1. Fuses used in circuits 200 VAC and above shall be time-delay type FNQ or approved equal, 13/32” x 1-1/2”, and have an interrupting rating of 42,000 AIC at 500 VAC. Fuse holders shall be of the barrier type and rated 600 VAC.
2. Fuses used in 120 VAC shall be time-delay type MDL or approved equal, 1/4” x 1-1/4”, and have a rating of 250 VAC. Fuse-holders shall be of the terminal block type.
3. Fuses used in signal and 24 VDC circuits shall be fast acting type GMA or approved equal, 5 mm x 20 mm/1/4” x 1-1/4”, and have a rating of 250 VAC. Fuse-holders shall be of the terminal block type.
4. Fuses shall be sized in conformance with the NEC.

2.05 COMPONENTS

A. Switches and Pushbuttons

1. Switches and pushbuttons for general purpose applications shall be water and oil tight as defined by NEMA 4X, corrosion resistant as defined by NEMA ICS 6-110.58, U.L. listed, standard 30 mm diameter, with round plastic clamp ring. Switches shall be Allen-Bradley 800H, or approved equal.
2. Switches and pushbuttons shall have contacts rated 10 amperes continuous and 600 VAC.
3. Manufacturer’s standard size legend plates shall be provided and engraved to specify each switch and pushbutton function. The legend plate color shall be black.
4. Selector switch handles and pushbutton caps shall be black.
5. Selector switches for hand-off-auto (HOA) applications shall have the hand position to the left, off in center, and auto in the right position.
6. Potentiometer be 10kohm, manual single turn potentiometer.
7. On/Off selector switches shall have the “ON” position to the right.
8. Lockout stop shall be a pushbutton with red cap and pad locking assembly for pushbutton.

B. Relays and Timers

1. GENERAL: Relays and timers shall be provided with N.O. or N.C. contacts as shown on the Contract drawings. All spare contacts shown shall be provided. Contacts shall be rated 10 amps minimum at 120 VAC, 60 Hz unless otherwise stated. Supply power or coil voltage shall be 120 VAC unless shown otherwise on the Contract drawings. Relays and timers shall be designed for continuous duty. All relays shall be U.L. listed. The following is a summary of abbreviations associated with relays and timers:

CR	–	Control relay
TR	–	Timing relay
TDOE	–	Time delay on energization
TDOD	–	Time delay on de-energization

2. Control relays (CR) shall be plug-in type with indicating lights and clear see-through sealed or enclosed housing to exclude dust. Sockets for plug-in relays shall be

standard industrial blade type with barrier pressure screw terminals. Provide IDEC Type RR, or approved equal. Two form-C contacts (minimum) shall be provided on each relay.

3. Time delay relays (TR) on energization or de-energization shall be solid state plug-in relays with a timer adjustable over the range 1 second to 3 minutes unless other ranges are indicated or required. Provide LED timer energized indicator lamp. Sockets for plug-in timers shall be standard industrial type with barriered pressure screw terminals. Time delay relays shall be IDEC GTS, or approved equal.

C. Indicating Lights

1. Indicating Lights for general purpose applications shall be water and oil tight as defined by NEMA 4X, corrosion resistant as defined by NEMA ICS 6-110.58, U.L. listed, High intensity multi-chip LEDs, full voltage (unless shown otherwise), standard 30 mm diameter, with round plastic lens and miniature bayonet lamp base. Indication lights shall be Allen-Bradley 800H, or approved equal.
2. Manufacturer's standard size legend plates shall be provided and engraved to specify each light's function. The legend plate color shall be black.
3. Indicating lights designated "PTT" shall be provided with a push-to-test switch and wiring.
4. Indicating light type and color of lens shall be as shown on the Drawings or specified in the Contract documents. Lamp color will be as follows:
   a. Open/On Green
   b. Closed/Off Red
   c. Alarm Amber
   d. Power On White

D. Circuit Breakers

1. Circuit breakers shall be of the indicating type, providing ON, OFF and TRIPPED positions of the operating handle. Circuit breakers shall be quick-make, quick-break, with a thermal-magnetic (TM) action or Motor Circuit Protectors (MCP) as shown on One-Line Diagrams. Circuit breakers feeding Soft Starters or VFDs shall have true adjustable long, short and instantaneous trip units.
2. Main Circuit breakers shall be the bolted on type. The use of tandem or dual circuit breakers in a normal single-pole space to provide the number of poles or spaces specified are not acceptable. All multiple-pole circuit breakers shall be designed so that an overload on one pole automatically causes all poles to open. Main Circuit breakers and motor circuit protectors shall be manufactured by Eaton, G.E., ITE, or approved equal.
3. Each 480 volt or 240V circuit breaker shall have a minimum interrupting capacity of 35,000 amperes. Each 120 volt breaker shall be rated for a minimum 10,000 amperes interrupting capacity. Breakers shall be sized as shown on Drawings and as necessary for the supplied equipment.
4. Fused disconnects shall not be used in place of breakers.

5. Breakers shall be sized and have a minimum interrupting capacity as shown on Drawings and as required for the supplied equipment.
6. All breakers shall be supplied with the correct sized copper only lugs for wire sizes as listed in “Conduit & Wire Routing Schedule”. Provide larger frame breaker or lug adapters as necessary when connecting to the listed oversized wire.

2.06 CONTROL PANEL

A. Control panel shall consist of the PLC system, power supply, enclosure, Operator Interface and other devices for a complete and operational system. No equal are allowed for PLC and OI components.
   1. Processor Logic Controller (PLC) to be Allen-Bradley MicroLogix 1400 series provided with:
      a. Processor 1766-L32AWAA with battery, built-in Ethernet port, 20 discrete inputs, 12 discrete relay outputs, 4 analog voltage inputs & 2 analog voltage outputs, and removable flash memory card.
      b. Communication cables between PLC and Operator Interface (via Ethernet Switch).
      c. Communication cables between PLC and Radio.
      d. Provide end caps as required.
      e. All wiring from the PLC I/O terminals shall be wired to interface terminal blocks, including all spares.
      f. Connect OI to PLC utilizing Ethernet.

B. Operator Interface:
   1. Provide Operator Interface (OI) Automation Direct (C-More) 7” TFT Color Touchpanel system, or approved equal. OI to be panel mounted through cutout in Control Panel door. Provide all cables, configuration software, user manual and mounting hardware necessary for a complete and operable system.
   2. Provide an operator interface that meets the following requirements:
      a. Touch screen operator interface with built-in Ethernet Communication Port and USB port.
      b. Operator interface with 7.4” TFT color liquid crystal display with analog resistive NEMA 4X touch screen.
      c. 120VAC powered
      d. Compatible with Allen-Bradley MicroLogix.
      e. Operator terminal capable of setup using standard PC.
   3. Full programming software to be licensed and delivered to Owner.
   4. Devices:
      a. Lights, switches, pushbuttons, terminal blocks etc. to match those specified under Devices subsection.
      b. Connection between Ethernet Port and Ethernet switch shall be made with Cat 6 patch cable. Patch cable shall be 4 pair stranded PVC cable with HI-FLEX conductors. Length shall be 5 feet minimum. Color of cable shall be red. Ethernet

patch cables shall be labeled with primary devices it is connected to (i.e. “PLC,” “OI,” etc.).

c. Ethernet switch shall be Hirschmann Industrial Managed Ethernet switch, N-Tron or approved equal.

d. Receptacle to be duplex and rated 20 amps, 120 VAC, 2 pole, 3 wire grounding, NEMA 5-20R configuration, specification grade, and side wired to screw terminals.

e. DC power supply to be non-switching, VDC quantity and sizes per Contract drawings, Power One Linear series, Sola or approved equal.

f. RFI filter for radio interference protection shall be Corcom 15VK, or approved equal.

g. Uninterruptible power supply:

1) The Uninterruptable power supply (UPS) to provide VA shown on Contract drawings (minimum) backup power upon power failure to the 24 VDC power supply, Operator Interface (OI), 120VAC powered instruments & displays, and the processor logic controller (PLC) and PLC I/O cards in the Control Panel for 15 minutes (minimum).

2) Mount UPS in control compartment and provide all necessary power wiring. Plug cords and receptacles shall be provided so that the UPS can be readily bypassed with power being obtained directly from the panelboard.

3) UPS to have temperature rating compatible with expected internal enclosure temperature. Provide enclosure with adequate ventilation fans or AC unit to keep enclosure internal temperature within UPS temperature rating.

4) UPS to be Allen-Bradley, APC Smart-UPS Smart Slot, Marathon or approved equal.

h. Isolator shall provide complete isolation of the 4-20 mA output signal from the input signal and isolator power supply. Each isolator shall have all solid state circuitry mounted in a plug-in module. The 4-20 mA output signal shall be capable of driving a 600 ohm load. Both accuracy and linearity shall be +/- 0.10% of span. The isolator shall be powered as shown on Contract Drawings. Each isolator shall be as manufactured by AGM Electronics, Action Instruments, or approved equal.

C. Provide metal data pocket within each enclosure to hold as-built drawings.

2.07 FIELD DEVICES

A. Submersible level probes to be range shown in Instrument Index with minimum accuracy of ±1% with 4-20 mA output loop powered Blue Ribbon Birdcage BC001 to match District standards.

2.08 RADIO SYSTEM

A. Radio modem:

1. Radio shall be CalAmp Viper SC+ 100 Intelligent router, 136-174 MHz to match Owner standard.

2. Radio shall be programmed by Contractor with parameters provided by owner.

3. Install radio within Control Panel such that LED lights are visible with panel door open.
4. Transmission cable:
    a. A backpan mount antenna lightning "N" connector arrestor shall be furnished on the antenna coaxial transmission line. The lightning arrestor shall be grounded to the panel ground bus with a #8 AWG or larger bonding wire. The lightning arrestor shall be a PolyPhaser IS-50NX-C2 or approved equal.
    b. Provide miscellaneous hardware such as grounding kits, hanger kits, and feed through assemblies.
    c. The cable shall be carefully installed to prevent damage to the jacket and routed with a minimum bending radius of 8 inches.
    d. Provide connector weatherproofing kits for outdoor exposed connectors and grounding strap attachments. All mating connectors that are exposed to weather shall be wrapped with a sealing material designed to protect against water and dirt entry into the connectors.

2.09 CONDUIT, RACEWAYS AND WIREWAYS

A. General: Conduit, raceways, wireways, wiring methods, materials and installation shall meet all requirements of the NEC, be UL labeled for the application, and meet the minimum following specifications:
    1. All wiring shall be installed in conduits, raceways, or wireways when interconnecting equipment and devices.
    2. The Contractor shall use special conduit, raceways, wireways, construction methods, and materials as shown on the Contract drawings; which shall take precedence over any general methods and materials specified in this Section.
    3. The minimum size conduit shall be ¾-inch unless indicated otherwise on the Drawings or for special connections to equipment.
    4. Conduit stubs for future use shall be capped with coupling, nipple, plug, and cap and each end identified with conduit labels.
    5. Conduits to be abandoned that protrude above graded shall be cut flush and filled with grout
    6. Conduits shall not be filled to more than 50% of their total cross – sectional area.
    7. Conduits entering enclosures shall be fitted with insulated grounding bushing; O-Z "HBLG," Appleton "GIB," or approved equal. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.

B. Conduit Marking
    1. All conduits listed in the “Conduit and Wire Routing Schedule” shall have conduit tags at both ends of each conduit segment. This includes all conduits in pullboxes and vaults.
    2. Tag material shall be rigid laminated red phenolic with white lettering. The size of the tag shall be 2” diameter. No letters are allowed smaller than 7/16”. Securely fasten tags in place using 316 stainless steel 0.048 inch diameter wire of the type normally used for this purpose (catalog cut sheet shall be submitted). Stainless steel wire shall

be crimp connected. Twisting ends together is not acceptable. Engrave the tags, on both sides, with the conduit number as listed in the Conduit and Wire Routing Schedule on the Contract “E”-series Drawings. Labeling shall be neatly installed for visibility and shall be clearly legible. Conduit tags shall be Brady Custom B-1, or approved equal.

3. Prior to encasement, concealment, backfilling of conduits, temporary conduit labels shall be provided at each end of conduit. Temporary conduit labels shall have ½-inch (minimum) lettering at all transition points. After encasement and concealment temporary conduit labels shall be placed at each exposed end.
4. Warning Tapes:
    a. Bury detectable warning tapes approximately 12 inches above all underground conduit runs of two or more outside of building. Align parallel to and within 3 inches of the centerline of the conduit or duct bank.
    b. Plastic tape shall be colored for particular underground service, 3-inch minimum width, utilize tape made of material resistant to corrosive soil. Tape shall have aluminum backing to facilitate locating it underground using a non-ferrous locator. Use red tape for “Electric” service and orange tape for “Communication” service. Use tape with printed wording listing type of service. Manufacturers and types: Seton, Blackburn, Griffolyn Co., Terra-Tape, Brady or equivalent.

C. Galvanized Rigid Steel Conduit (GRS)
1. Rigid steel conduit, couplings, bends and nipples shall be in accordance with ANSI C80.1 and UL-6.
2. Hotdip galvanized inside and outside after fabrication and then coated with a zinc bichromate finish.
3. Minimum trade size – three-quarters inch (¾”) unless otherwise shown on Contract Drawings.
4. Conduits entering enclosures shall be fitted with insulated grounding bushing; O-Z "HBLG", Appleton "GIB", or approved equal. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.
5. Galvanized rigid steel factory elbows for indoor 90 degree transitions.
6. EMT or IMC is not considered an equivalent to GRS.
7. GRS conduit is allowed only when specifically called out in the “Conduit and Wire Routing Schedule”.

D. Galvanized Rigid Steel Conduit – PVC Coated (GRS-PVC)
1. Standard weight, galvanized conduit with a 40-mil thick polyvinylchloride coating bonded to both the outside and urethane interior coating. Conduit shall be hot-dip galvanized conforming to NEMA RN 1. GRS-PVC conduit to be Robroy Plasti-bond Red, Perma-Cote, or approved equal.
2. Provide PVC coated galvanized rigid steel factory elbows for 90 degree transitions.
3. Fittings shall be hot dipped galvanized steel or galvanized cast ferrous metal with a PVC 40 mils thick coating. Provide threaded-type fittings, couplings, and connectors; set-screw type and compression-type are not acceptable. Fittings shall be Robroy Liquitite coated fittings or approved equal.

4. All junction boxes shall be galvanized with exterior surfaces PVC coated to 40 mils thickness except where 316 stainless steel boxes are called out.
5. Conduits entering enclosures shall be fitted with insulated grounding bushing; O-Z "HBLG", Appleton "GIB", or approved equal. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.
6. Support channel and pipe straps shall be PVC coated. Exposed metal/nuts, all-thread rod shall be 316 stainless steel.
7. PVC coating patching material shall be as provided by the manufacturer.
8. PVC coated Aluminum conduit is not acceptable.

E. Liquid Tight Flexible Metal Conduit (FLEX)

1. Minimum trade size one-half inch (1/2").
2. All flex conduits shall be metallic with water tight outer jackets.
3. Connectors:
   a. NON-NEMA 12 AREA: PVC coated metallic with insulated bushings.
   b. NEMA 12 AREA: Metallic with insulated bushings.
4. Final connections to vibrating equipment such as motors and fans shall be made with flexible conduits.
5. Flexible conduit lengths shall not be greater than 36 inches.
6. Flexible metallic conduit shall not be considered as a ground conductor, install a separate wire for equipment bonding.
7. Flexible conduit shall only be installed in exposed or accessible locations.
8. Flexible conduits shall be used for conduit coupling to all vibrating and shifting equipment.

2.10 WIRING DEVICES

A. Boxes

1. Device boxes shall be of zinc-galvanized steel type with shape and size best suited for the particular application, rated for the location installed, and shall be supported directly to structure by means of screws, anchors, or bolts.
2. Box dimensions shall be in accordance with size, quantity of conductors, and conduit clearances per NEC articles 314 requirements.
3. Non-Weatherproof Boxes - Surface boxes shall be cast ferrous, deep FD type with threaded hubs.
4. Weatherproof (WP) Boxes - PVC-coated cast ferrous boxes may be used in place of 316 stainless steel boxes, except where boxes contain devices on cover. Boxes shall be deep, FD type with threaded hubs or stainless steel with watertight Myers hubs. Single gang boxes shall have cast hubs.

B. Switches

1. General purpose switches shall be manufactured in accordance with UL 20. Switches shall be one pole rated, 20 amps, at 277 VAC. Bodies shall be of ivory phenolic compound supported by mounting strap having plaster ears. Switches shall have copper alloy contact arm with silver cadmium oxide contacts. Switches shall have slotted terminal screws and a separate green grounding screw. Furnish Hubbell 1221, Leviton 1221, or approved equal.

C. Receptacles

1. General purpose receptacles shall be duplex and rated 20 amps, 120 VAC, 2 pole, 3 wire grounding, NEMA 5-20R configuration, specification grade, and side wired to screw terminals. Face color shall be white or ivory. General purpose receptacles shall be Leviton 5362, Bryant, Hubbell, or approved equal.
2. GFI (ground fault circuit interrupting) receptacles shall be used in all boxes shown as weatherproof. GFI receptacles shall be duplex, 20A, 120V, with “test” and “reset” buttons with shallow design for mounting and standard screw terminals for direct wiring. Receptacles shall be designed, manufactured, and tested to prevent nuisance tripping from voltage spikes, RFI, EMI, or electronic component failures. Chaining multiple receptacles from one GFI unit is not acceptable. GFI receptacles shall be Leviton 6899, Arrow-Hart or approved equal.

D. Device Plates and Covers

1. General purpose device plates and covers shall be 316 stainless steel. Plates or covers shall be attached with 316 stainless steel screws. Circuit breaker number and panelboard name shall be stamped on each cover.
2. PVC coated device boxes shall have PVC-coated gasketed covers.
3. Weatherproof switch, outlet, and receptacle boxes shall be fitted with gasketed covers rated for wet locations in accordance with NEC 404.4.
4. Weatherproof switch, outlet, and receptacle boxes shall be fitted with cast aluminum gasketed cover rated for wet locations. Each receptacle access cover shall have a gasketed spring door to maintain the weatherproof integrity with plug inserted in accordance with NEC 406.9 for unattended locations. Final decision of type of access cover for specific location shall be per Engineer. Screws and hinge springs shall be 316 stainless steel. Receptacles located outside shall have tumbler key lock.
5. Weatherproof access covers shall be Hubbell, Crouse-Hinds, or TayMac Safety Outlet Enclosures, or approved equal.
6. Receptacle & light switch plates shall be stamped or engraved as specified in section Nameplates and Tags.

2.11 PULL BOXES

A. Underground pull boxes, where shown or required by length of conduit runs, shall be prefabricated concrete type with the size shown on the Drawings or larger to allow for adequate pull area. Extension sections shall be provided as necessary to reach the depth of underground conduits. All boxes shall have galvanized steel hold down bolts and

hardware. Boxes located in paved areas or other areas which vehicles may travel shall be H/20 loading rated and have diamond plate steel traffic covers. Steel covers or lids shall be galvanized. Pull box covers shall be labeled with pull box designation. All underground pull boxes shall have a 12-inch bedding of 3/4-inch nominal crushed rock. Pull boxes shall be Christy Concrete Products, Brooks, or approved equal.

2.12 GROUNDING SYSTEM

A. Ground clamps shall be bolt-on type as manufactured by ILSCO type AGC, O-Z Gedney Type GRC, Burndy Type GAR or GP or approved equal.

B. All ground rod, pipe, and steel plate and buried bond connections shall be made by welding process equal to Cadweld.

C. Ground buses shall be provided in all electrical enclosures. Each ground bus shall be sized as shown on the Contract drawings or specified herein. The ground bus shall be adequately sized for the connection of all grounding conductors required per NEC. Screw type lugs shall be provided on all ground busses for connection of grounding conductors.

D. Each ground bus shall be copper. Screw type fasteners shall be provided on all ground busses for connection of grounding conductors. Ground bus shall be a Challenger GB series, ILSCO D-167 series or approved equal.

E. Attachment of the grounding conductor to equipment or enclosures shall be by connectors specifically provided for grounding. Mounting, support, or bracing bolts shall not be used as an attachment point for ground conductors.

F. All raceway systems, supports, enclosures, panels, and equipment housings shall be permanently and effectively grounded.

G. One side of the secondary on all transformers shall be grounded.

H. The system neutral (grounded conductor) shall be connected to the system's grounding conductor at only a single point in the system. This connection shall be made by a removable bonding jumper sized in accordance with the applicable provisions of the National Electrical Code if the size is not shown on the Drawings. The grounding of the system neutral shall be in the enclosure that houses the service entrance main over-current protection.

I. The system neutral conductor and all equipment and devices required to be grounded by the National Electrical Code shall be grounded in a manner that satisfies the requirements of the National Code.

J. Grounding conductors shall be sized as shown on the Plans or in accordance with NEC Table 250.122, whichever is larger.

K. Grounding and bonding wires shall be installed on all conduits with grounding bushings, expansion joints and for continuity of raceways transitions. Bonding wires at endpoints shall be connected to enclosure ground bus or equipment grounding lug.

L. Conduit grounding bushings shall be installed on all metallic conduits. Conduit grounding bushings shall be set screw locking type electra-galvanized malleable iron with insulation collar and shall be provided with a feed through compression lug for securing the ground bonding wire. Ground bonding wire shall be bare wire and shall be sized per NEC.

M. All receptacles shall have their grounding contact connected to a grounding conductor.

N. Branch circuit grounding conductors for receptacles, or other electrical loads shall be arranged such that the removal of a lighting fixture, receptacle, or other load does not interrupt the ground continuity to any other part of the circuit.

O. Negative side of all VDC power supplies shall be grounded.

2.13 ELECTRICAL ENCLOSURES AND BOXES

A. Enclosures and boxes to be wall mounted, minimum 14 gauge, type 316 stainless steel with seams continuously welded & ground smooth, and fast access door latches. A copper ground bus shall be provided in the enclosure. Outer door shall have provisions for locking enclosure with standard padlock. Provide white backpan in box.

B. Provide accessories consisting of breaker to disconnect incoming power, heater, fan, removable metal louvers, and thermostats, where shown on Contract drawings.

C. Provide larger enclosure as required to accommodate the supplied equipment at no additional cost to the Owner

D. Provide metal data pocket within each enclosure and box to hold as-built drawings.

E. All panel doors shall be installed with ground straps.

F. Panels shall be provided with engraved nameplate identifying name of panel, voltage and location of power source feeding it (i.e. MCC-100, Panelboard LP-1, etc.).

G. Top of operator interface (pilot devices / breaker) to be maximum 66” above finished floor.

H. Enclosure shall be Hoffman, Circle AW or approved equal.

PART 3 - MATERIALS

3.01 ELECTRICAL WORKMANSHIP

A. All work in this Section shall conform to the codes and standards outlined herein.

B. The Electrical Contractor shall employ personnel that are skilled and experienced in the installation and connection of all elements, equipment, devices, instruments, accessories, and assemblies. All installation labor shall be performed by qualified personnel who have had experience on similar projects. Provide first class workmanship for all installations.

C. Ensure that all equipment and materials fit properly in their installations.

D. Perform any required work to correct improper installations at no additional expense to the Owner.

E. The Engineer reserves the right to halt any work that is found to be substandard or being installed by unqualified personnel.

3.02 ELECTRICAL CONSTRUCTION METHODS, GENERAL

A. All wiring shall be neatly bundled and laced with plastic tie-wraps, anchored in place by round-head 316 stainless screw attached retainer. Where space is available, such as in electrical cabinets, all wiring shall be run in slotted plastic wireways or channels with dust covers. Wireways or channels shall be sized such that the wire fill does not exceed 50%. Wires carrying 100 volts and above shall be physically separated from lower voltage wiring by using separate bundles or wireways with sufficient distance to minimize the introduction of noise, crossing only at 90 degree angles. Tie-wraps shall be T & B TY-RAP's, or approved equal.

B. Where wiring crosses hinged surfaces, provide a "U" shaped hinge loop protected by plastic spiral wrap. The hinge loop shall be of sufficient length to permit opening and closing the door without stressing any of the terminations or connections.

C. All devices shall be permanently labeled and secured in accordance with subsections labeled "NAMEPLATES AND TAGS".

D. All field wires and panel wires have wire markers as specified in the "WIRE" subsection.

E. All components associated with a particular compartment's or enclosure's function shall be mounted in that compartment or enclosure.

F. Spacing and clearance of components shall be in accordance with UL, JIC, and NEC standards.

G. Wires shall not be spliced except where shown. Devices with pigtails, except lighting fixtures, shall be connected at terminal blocks. Equipment delivered with spliced wires shall be rejected and the Contractor required to replace all such wiring, at no additional cost to the Owner.

H. No wires shall be spliced without prior approval by the Engineer.

I. Where splices are allowed or approved by the Engineer they shall conform with the following:

1. Splices of #10 and smaller, including fixture taps, shall be made with see-thru nylon self-insulated twist on wire joints; T & B “Piggys”, Ideal “Wing Nut”, or approved equal.
2. Splices of #8 and larger shall be double crimped splices, or approved equal, insulated with heat shrink tubing, or approved equal.
3. Splices in underground pullboxes shall be insulated and moisture sealed with 3M “Scotchcast” cast resin splice kits and shall have a date marking for shelf life. Do not use splice kits with a date marking for shelf life that has expired.
4. Wire splicing devices shall be sized according to manufacturer’s recommendations.
5. Tape on splices shall not be allowed.
6. Splices for motor leads shall be made with T&B MSC series splice kit, or approved equal.

J. Tapes shall conform to the requirements of UL 510 and be rated: 105 degrees C, 600V, flame retardant, hot and cold weather resistant. Vinyl plastic electrical tape shall be 7 mil black. Phase tape shall be 7 mil vinyl plastic, color coded as specified. Electrical insulation putty shall be rubber based, elastic putty in tape form. Varnished cambric shall not be used.

K. Connections to terminals shall be as follows:

1. Use connector or socket type terminals furnished with component.
2. Connections to binding post screw, stud or bolt use:
    a. For #10 and smaller wire, T & B “Sta-Kon”, Buchanan “Termend” or approved equal, self-insulated locking forked tongue lug.
    b. For #8 to #4/0 wire, T & B “Locktite”, Burndy QA or approved equal lug of shape best suited.
3. Use ratchet type crimping tool which does not release until proper crimp pressure has been applied.
4. Connections to terminals shall be as follows:
    a. Use connector or socket type terminals furnished with component.
    b. Connections to binding post screw, stud, or bolt use:
        1) For #10 and smaller wire, T & B "Sta-Kon", Buchanan "Termend", or approved equal, self-insulated locking forked tongue lug.
        2) For #8 to #4/0 wire, T & B "Locktite", Burndy QA, or approved equal, lug of shape best suited.
    c. Use ratchet type crimping tool which does not release until proper crimp pressure has been applied.
    d. Connections for all terminals shall be made with insulation stripped per manufacturer's instructions.

L. Equipment shall be wired and piped by the manufacturer or supplier. Major field modifications or changes are not allowed without the written “change order” authority by the Engineer. When field changes are made, the components, materials, wiring, labeling, and construction methods shall be identical to that of the original supplied equipment. Contractor’s cost to replace or rework the equipment to match original manufacturer or supplier methods shall be done at no additional cost to the Owner.

M. Mating fittings, bulkhead fittings, plugs, lugs, connectors, etc. required to field interface to the equipment and panels shall be provided by the supplier when the equipment is delivered.

N. All electrical and instrumentation factory as-built drawings associated with the equipment shall be provided with the equipment when it is delivered to the job site. Drawings for each piece of equipment shall be placed in clear plastic packets of sufficient strength that will not tear or stretch from drawing removal and insertion.

3.03 ELECTRICAL EQUIPMENT FABRICATION, GENERAL

A. Panel cutouts for devices (i.e. indicating lights, switches) shall be cut, punched, or drilled and smoothly finished with rounded edges. Exposed metal from cutouts that are made after the final paint finish has been applied shall be touched up with a matching paint prior to installing device. Do not paint nameplates, labels, tags, switches, receptacles, conductors, etc.

B. All doors shall be fully gasketed, with non-shrinkable water and flame resistant material.

C. Bolts and screws for mounting devices on doors shall be as specified by the manufacturer, otherwise they shall have a 316 stainless steel flush head which blends into the device or door surface. No bolt or screw holding nuts shall be used on the external surface of the door.

D. No fastening devices shall project through the outer surfaces of equipment.

E. Each component within the equipment shall be securely mounted on an interior subpanel or backpan and arranged for easy servicing, such that all adjustments and component removal can be accomplished without removing or disturbing other components. Mounting bolts and screws shall be front located for easy access and removal without special tools. Access behind the sub panel or backpan shall not be required for removing any component.

F. HARNESS: Where space is available, all wiring shall be run in slotted plastic wire ways or channels with dust covers. If space is not available for wireways, then all wiring shall be neatly bundled and laced with plastic tie-wraps, anchored in place by 316 stainless steel screw attached retainer. Wire ways or channels shall be sized such that the wire fill does not exceed 50%. Tie-wraps shall be T&B TY-RAP, or approved equal.

G. HINGE LOOPS: Where wiring crosses hinged surfaces, provide a “U” shaped hinge loop protected by clear nylon spiral wrap. The hinge loop shall be of sufficient length to permit opening and closing the door without stressing any of the terminations or connections. Spiral wrap shall be Graybar T25N, or approved equal.

H. RETAINERS: Wire ways, retainers, and other devices shall be screw mounted with round-head 316 stainless steel screws or mechanically mounted by push-in or snap-in attachments. Glue or sticky back attachment of any type or style shall not be used. Retainers shall be Panduit High Bond Adhesive back mounts SGABM series, or approved equal.

I. ROUTING: Wires shall be routed in slotted plastic wire-ways with snap covers.

1. Wires carrying 120 VAC shall be separated as much as possible from other low voltage wires and signal cables, and shall be routed only in ducts for 120 VAC. If the power wiring has to cross the signal wiring, the crossing shall be as close to a right angle as possible.
2. Ducts for 24 VDC wiring shall be used for all other wires and cables. Routing of 120 VAC in combined ducts is not allowed without prior written approval of the Owner.
3. Wires and cable shall be routed along the shortest route between termination points, excepting routes which would result in routing 120 VAC and other wires and cables in the same duct. Wires and cables shall have sufficient length to allow slack and to avoid any strain or tension in the wire or cable.
4. Wires and cables shall be placed in the ducts in a straight, neat and organized fashion and shall not be kinked, tangled or twisted together. Additional wire ducting shall be provided for use by the electrical subcontractor for routing field wires to their landing points in the each electrical and instrumentation panel.
5. Wiring not routed in duct work shall be neatly bundled, treed, and laced with plastic ties. Wiring across door hinges shall be carefully made up and supported to avoid straining and chafing of the conductors or from putting any strain on their terminals.

J. TERMINATIONS: Single wire and cable conductors shall be terminated according to the requirements of the terminal device. All terminations must be made at terminals or terminal blocks. Use of spring or buttsplice connectors are not allowed.

1. Provide 2” minimum separation between wireway and terminal blocks. Installation of wireways too close to terminal blocks will be required to be completely reworked to the satisfaction of the Owner.
2. For captive screw pressure plate type terminals, the insulation shall be removed from the last 0.25 inches of the conductor. The conductors shall be inserted under the pressure plate to full length of the bare portion of the conductor and the pressure plate tightened without excess force. No more than two conductors shall be installed in a single terminal. All strands of the conductor shall be captured under the pressure plate.
3. Terminal blocks and same equipment type termination wiring shall have all wiring terminated with appropriate sized ferrules with insulation collars. Ferrule crimping (full ratcheting) tool with proper sized jigs shall be used per manufacturer’s recommendations.
4. For screw terminals, appropriately sized locking forked spade lugs shall be used. Lugs shall be crimp on type that form gas tight connections. All crimping shall be done using a calibrated crimping tool made specifically for the lug type and size being crimped.
5. On shielded cables, the drain wire shall be covered with insulating tubing along its full bare length between the cable jacket and the terminal lug or terminal pressure plate.

6. For screwless terminals, wire shall be stripped back and inserted per the manufacturer's instructions. When stripping insulation from conductors, do not score or otherwise damage conductor.
7. Heat shrink shall be placed on ends of shielded cable to cover foil.
8. Additional condulets with terminal blocks shall be supplied for wire termination to devices with leads instead of terminals. (i.e., solenoid valves, level probe, etc.).
9. Terminate all status, control, and analog I/O wiring on terminal blocks, including spares. Provide additional relay, DIN rails, terminal blocks and side panels as required.

K. A ground bus shall be provided in each enclosure or cabinet. It shall have provisions for connecting a minimum of ten grounding conductors. Screw type lugs shall be provided for connection of grounding conductors. All grounding conductors shall be sized as shown on plans or in accordance with NEC Table 250.122, whichever is larger.

L. Minimum wire bending space at terminals and minimum width of wiring gutters shall comply with NEC Tables 373.6(A) & (B).

M. Wire sizes shall not be installed smaller than those shown in NEC Article 310 for each circuit amperage rating.

N. Future device and component mounting space shall be provided on the door, backpan, and subpanel where detailed on the Drawings. Where no detail is shown, provide a minimum of 15 percent usable future space.

O. Doors shall swing freely a minimum of 90º and close with proper alignment.

P. Provide larger motor termination boxes as required to accommodate conduit and wires.

3.04 DELIVERY

A. Contractor shall inspect each electrical and instrumentation item delivered to the jobsite.

B. Contractor shall unpack each item for inspection within two (2) days of arrival.

C. Complete written inventory shall be produced by Contractor and submitted to Owner within (2) days after arrival on jobsite for record keeping prior to any payment for the item.

D. All panels and enclosures be delivered with as-built drawings in clear plastic packets within each panel and enclosure.

3.05 DAMAGED PRODUCTS

A. Damage products will not be accepted. All damaged products shall be replaced with new products at no additional cost to the Owner.

3.06 FASTENERS & LUGS

A. Fasteners for securing equipment shall be 316 stainless steel. The fastener size shall match equipment mounting holes. Layout to maintain headroom, neat mechanical appearance, and to support equipment loads required.

B. All wire & cable lugs shall be copper; aluminum or aluminum alloy lugs shall not be used. The Electrical Contractor shall supply all lugs to match the quantity & size of wire listed in the conduit & wire routing schedule.

C. Anchor Methods:

1. Hollow Masonry: Sleeve-type anchors.
2. Solid Masonry: Sleeve-type anchors or epoxy anchor bolts.
3. Metal Surfaces: Machine screws, bolts or welded studs.
4. Concrete Surfaces: Wedge or expansion 316 stainless steel anchors.
5. Structural Steel: Right angle, parallel and edge type rigid metal clamps. Do not weld or drill structural steel.

D. Equipment Mounting:

1. The Electrical Contractor shall be responsible for furnishing and setting all anchor bolts required to install his equipment.
2. Electrical equipment shall be unistrut “stand off” mounted a minimum of ½ - inch from the wall in a manner so that the rear of the equipment is freely exposed to air circulation. Unistrut material shall be 316 stainless steel in NEMA 4X areas and galvanized in non-NEMA 4X areas unless called out specifically in details.
3. All equipment enclosures shall be of the NEMA classification noted on the electrical plan Drawings for the area in which the device will be mounted.
4. Reinforced concrete pad with 316 stainless steel anchor bolts shall be provided for each electrical freestanding equipment.

E. Dissimilar metals such as aluminum, stainless steel, steel, galvanized steel between enclosures, devices, etc. and mounting surfaces shall be isolated from each other using insulated tape or nonmetal spacers. Tape and spacers used shall be specifically manufactured for this application.

3.07 INSTALLATION, GENERAL

A. System

1. Install all products per manufacturer’s recommendations and the Drawings.
2. Contract Drawings are intended to show the basic functional requirements of the electrical system and instrumentation system and do not relieve the Contractor from the responsibility to provide a complete and functioning system.
3. Keep a copy of the manufacturer’s installation instructions on the jobsite available for review at all times prior to and during the installation of the associated equipment.

B. Provide all necessary hardware, conduit, terminal blocks, wiring, fittings, and devices to connect the electrical equipment provided under other Sections. The following shall be done by the Contractor at no additional cost to the Owner:

1. Provide additional devices, wiring, terminal block, conduits, relays, signal converters, isolators, boosters, and other miscellaneous devices as required to complete interfaces of the electrical and instrumentation system.
2. Changing normally open contacts to normally closed contacts or vice versa.
3. Adding additional relays to provide more contacts as necessary.
4. Provide larger circuit breakers, conduit and wire as required for the horsepower of the supplied equipment when the supplied equipment is larger than that specified, at no additional cost to the Owner. Provide lug adapters as necessary when connecting to the wires listed in the Conduit and Wire routing schedule.
5. Installing additional terminal blocks to land wires.

C. All programmable devices, shall be programmed, set-up and tested by the Contractor prior to start of witness testing. This includes UPS, PLCs, VFD and instrumentation. Programming and set-up parameters shall be adjusted or changed as directed by the Owner or Engineer during start-up and throughout the warranty period, at no additional cost to the Owner. Coordinate with the Owner and setup all alarm, process, time delays and operation setpoints.

D. Coordinate with the Owner and setup all alarm, process, and operation setpoints.

E. Panels and Enclosures

1. Install panels and enclosures at the location shown on the Plans or approved by the Engineer.
2. Install level and plumb.
3. Clearance about electrical equipment shall meet the minimum requirements of NEC 110.66.
4. Box supports shall be located and oriented as directed in field by Owner.
5. Seal all enclosure openings, including bottom edge of all pad mounted enclosures to prevent entrance of insects, rodents, dirt, debris, etc.
6. All conduits entering outdoor panels and enclosures shall use watertight hubs. These hubs shall be located on sides or bottom only. Top entry of outdoor panels or enclosures is not allowed unless specifically shown on plans.
7. Additional condulets with terminal blocks shall be supplied for wire termination to devices with leads instead of terminals. (i.e. solenoid valves, level probe, etc.)
8. Terminate all status, control, and analog I/O wiring on terminal blocks, including spares. Provide additional relay, DIN rails, terminal blocks and side panels as required.
9. All panels and enclosures be delivered with as-built drawings in clear plastic packets within each panel and enclosure.
10. Provide larger motor termination boxes as required to accommodate conduit and wires.

F. Conduits and Ducts

1. Care shall be exercised to avoid interference with the work of other trades. This work shall be planned and coordinated with the other trades to prevent such interference. Pipes shall have precedence over conduits for space requirements. Exposed conduits shall be neatly arranged with runs perpendicular or level and parallel to walls. Bends shall be concentric.
2. Exposed conduits runs shall not be run directly on the ground. Secure conduits to 316 stainless steel unistrut.
3. Install conduit free from dents and bruises.
4. All conduits shall be labeled with conduit tags on all ends; at junction boxes, pull boxes, enclosures, stub-outs, or other terminations. All spare conduits shall be labeled.
5. A maximum of three equivalent 90 degree elbows are allowed in any continuous runs. Install pull boxes where required to limit bends in conduit runs to not more than 270 degrees or where pulling tension would exceed the maximum allowable for the cable.
6. Route all above grade outdoor conduits or conduits in rated areas parallel or perpendicular to structure lines and/or piping.
7. Conduits installed outdoor or in NEMA 4X rated areas above grade shall be braced in place with 316 stainless steel Unistrut stanchions or PVC coated clamps with backplates.
8. Conduit entrances: Seal each conduit entrance from below grade into the panels, and other electrical enclosures with plugging compound sealant to prevent the entrance of insects and rodents.
9. Special “Soft–Jaw” type pipe clamps shall be used to prevent damage to PVC-coated conduits while field threading, cutting to length, and coupling sections.
10. Conduits shall be painted to match the color of surface attached to as directed by Owner.
11. Prior to encasement, concealment, backfilling of conduits, temporary conduit labels shall be provided at each end of conduit. Temporary conduit labels shall have ½-inch (minimum) lettering at all transition points. After encasement and concealment temporary conduit labels shall be placed at each exposed end.
12. Spare or Future Conduits:
    a. All spares conduits shall be labeled; the conduits shall be mandrelled and have pull ropes (pull tapes) installed.
    b. Pull rope shall be ½” wide, polyester, rated 1250 pounds tensile strength. Provide a waterproof label on each end of the pull rope to indicate the destination of the other end. Pull tape shall be printed with sequential footage. Pull tape shall be Neptco Muletape WP1250P or approved equal.
    c. Provide caps on conduit ends to prevent entrance of dirt or insects.
13. Conduits shall be painted to match the color of surface attached to as directed by Owner.

14. All existing conduits that are reused shall have a mandrel or conduit piston pulled through the entire conduit run to prove the length contains no blockages or obstructions. Mandrelling shall be witness by the Owner.
15. Install new conduit tags for reused conduits at all transition boxes and endpoints. Conduit & Wire Routing Schedule shall be updated as these modifications take place.

G. Conduit and Wire Routing Schedule

1. Conduit material, wire size, and quantity listed in schedule take precedence over Division 16 Specifications.
2. All of the entries for each line in the conduit schedule apply to each conduit when multiple quantity of conduits multiple quantity of conduits (quantity of which are indicated by number entered in conduit no. column in schedule) are listed in the schedule.
3. Wire sizes listed are in AWG or Kcmil and are copper conductors.
4. Extra wire was intentionally placed in the “Conduit & Wire Routing Schedule” which shall be labeled on both ends with a unique wire label.
5. Contractor to supply and install all conduits and wiring as shown on Utility Engineered Design drawings. Utility primary and secondary conduit and wiring shown in “Conduit and Wire Routing Schedule” is for bid purposes only. A credit or add-on will be provided by Contractor based on the actual work performed by Contractor for the Utility service.
6. All control and signal wiring terminations shall have the correct wire label applied prior to making connection.
7. Conduit entries listed as “GRS-PVC” in the Conduit & Wire Routing Schedule are to be “Galvanized Rigid Conduits with PVC coating” the entire length.
8. Vertical offsets and sloping of conduits are not detailed on plans, the Electrical Contractor shall include in his bid the price for the complete conduit run utilizing the civil & mechanical plans to measure vertical & slope distances.
9. Exposed conduits runs shall not be run directly on the ground or roof. Secure conduits to stainless steel unistrut.
10. Duct-taping conduits together is not acceptable. Conduits, installed into concrete pads, shall be installed with a minimum of 2” distance between conduits to allow installation of bushings.
11. Seals
    a. Seal around all conduits, wires, and cables penetrating between panels, walls, ceilings, and floors in all buildings with a fire stop material. Seal shall be made at both ends of the conduit with a fire stop putty. Seal shall have a minimum two hour rating. Fire stop sealing shall be International Protective Coatings Flamesafe, or approved equal.
    b. Seal around conduits entering outside to inside structures and around bottom of free standing enclosures to maintain watertight integrity of structure.
    c. Place conduit seal inside each underground conduit riser into panels and enclosures to prevent entrance of insects and rodents.

d. Seal conduits entering any electrical instrument and install conduit drains as necessary to prevent corrosion from water condensation.

e. Conduit entrances: Seal each conduit entrance from below grade into the MCC and other electrical enclosures with plugging compound sealant to prevent the entrance of insects and rodents. Conduits between the enclosures shall be sealed with plugging compound sealant on each end. Plugging compound sealant shall be PRC-DeSoto (formerly Courtaulds) Aerospace Semco PR-868 or approved equal.

H. Excavation and Back Filling

1. The Electrical Contractor shall provide the excavation for equipment foundations, and trenches for conduits or buried cables.

2. Underground conduits outside of structures shall have a minimum cover of 24 inches except for utility conduits depth shall be as required by the governing utility requirements. Back filling shall be done only after conduits have been inspected.

3. Trenches for all underground utility lines shall be excavated to the required depths.

4. Repave any area that was paved prior to excavation. Backfill and surface all areas as shown on the Drawings or where not shown to the original condition that was present prior to the excavation.

5. Contractor shall uncover any uninspected covered conduit trenches, at no additional cost to Owner, to verify proper installation.

6. Excavation and back fill conduit trenches shall conform to the requirements of the Earthwork Section of these Specifications, unless modified on plans, and to other entities as required. Backfill shall consist of 3/4 inch class 2 aggregate base material, unless otherwise noted.

7. At all times during the installation of the electrical distribution system, the Contractor shall provide barricades, fences, guard rails, etc., to safeguard all personnel, including small children, from excavated trenches.

I. Wiring, Grounding, and Shielding

1. It is important to observe good grounding and shielding practices in the generally noisy environment in this application. The shield of shielded cables shall be terminated to ground at one end only (source end), the shield at the other end (receive end) shall be encased in an insulated material to isolate it from ground.

2. Special cables shall be provided when required by manufacturer or necessary to correct noise or distortion interference at no additional cost to Owner.

3. Field wiring shall not begin until interconnection drawings have been submitted by the Contractor and approved by the Engineer.

J. Cutting and Patching: The Contractor shall do all cutting and patching required to install his work. Any cutting which may impair the structure shall require prior approval by the Engineer. Cutting and patching shall be done only by skilled labor of the respective trades. All surfaces shall be restored to their original condition after cutting and patching. Paint patched surfaces to match the original color.

K. Housekeeping Pads:

1. Concrete housekeeping pads are required for all free standing electrical equipment. Housekeeping pads shall be 3-1/2” inches above surrounding finished floor or grade unless otherwise shown and shall be 4 inches (minimum) larger in width on all sides of equipment. The depth of housekeeping pads shall be 18 inches (minimum).
2. Housekeeping pads shall be installed for future units as shown on the Contract Drawings.
3. Housekeeping pad shall be Class “A” concrete with rebar crossway network. The minimum size rebar allowed is #3. Concrete shall be precisely leveled so that equipment set in place will not require shimming.

L. Cleaning and Touch Up

1. Prior to startup and at completion of the work prior to final acceptance, all parts of the installation, including all equipment, exposed conduit, devices, and fittings shall be cleaned and given touch up by Contractor as follows:
    a. Remove all grease and metal cuttings.
    b. Any discoloration or other damage to parts of the building, the finish, or the furnishings, shall be repaired.
    c. Thoroughly clean any of his exposed work requiring same.
    d. Vacuum and clean the inside of all MCC and electrical and instrumentation enclosures.
    e. Clean all above and below ground pull boxes, junction boxes, and vaults from all foreign debris prior to final acceptance.
    f. Paint all scratched or blemished surfaces with the necessary coats of quick drying paint to match adjacent color, texture, and thickness. This shall include all prime painted electrical equipment, including enclosures, panels, poles, boxes, devices, etc.
    g. Remove all decals and lettering from both sides of support plates.
    h. Repair damage to factory finishes with repair products recommended by Manufacturer.
    i. Repair damage to PVC or paint finishes with matching touchup coating recommended by Manufacturer.

3.08 ELECTRICAL TESTING

A. General Requirements

1. It is the intent of these tests to assure that all equipment is operational within industry and manufacturer’s tolerances and is installed in accordance with design plans and specifications.
2. All equipment setup and assembled by the Contractor shall be in accordance with the design plans and Drawings and the manufacturer's recommendations and instructions and shall operate to the Engineer's satisfaction.
    a. Follow all manufacturer's instructions for handling, receiving, installation, and pre-check requirements prior to energization.

b. After energization, follow manufacturer's instructions for programming, set-up and calibration of equipment.

c. The Contractor shall be responsible for, and shall correct by repair or replacement, at his own expense, equipment which, in the opinion of the Engineer, has been caused by faulty mechanical or electrical assembly by the Contractor.

d. Necessary tests to demonstrate that the electrical and mechanical operation of the equipment is satisfactory and meets the requirements of these Specifications shall be made by the Contractor at no additional cost to the Owner.

3. The testing shall not be started until the manufacturer has completed fabrication, wiring, setup, and programming; performed satisfactory checks and adjustments; factory testing sheets approved by Owner; and can demonstrate the system is complete and operational.

4. Factory Test Scheduling:

   a. The testing shall not be started until:

      1) The manufacturer has completed fabrication, wiring, and setup; performed satisfactory checks and adjustments; and can demonstrate the system is complete and operational.

      2) Submittals associated with the equipment have been approved by the Engineer

      3) PLC Design review meetings have taken place to the satisfaction of the Owner.

      4) Certification of completion of Contractor's in-house tests shall be submitted prior to scheduling of factory testing.

   b. If factory test equipment is significantly different from submittal drawings, this shall be grounds for cancellation and rescheduling of factory tests at no additional costs to Owner or extension of Contract time.

5. The first Pre-Energization tests shall be performed to determine the suitability for energization and shall be completed with all power turned off and complete prior to the start of any of the Post-Energization Tests. The Electrical Contractor shall have qualified personnel on the job site for all Pre-Energization and Post-Energization tests.

6. Testing Sheets and Procedures:

   a. The supplier shall submit for approval, the proposed factory & field testing sheets at least two weeks prior to the start of the tests. Each testing sheet shall have a title giving the type of test and entry spaces for the name of the person who performed the test, name of the person who witnessed the test, and the date.

   b. Separate test procedures in separate binders shall be submitted for approval for the Factory and Field Tests. Testing shall not commence until the test procedures have been reviewed and approved by the Owner. Tests forms shall be similar to those shown on Appendix "A".

7. All tests shall be witnessed by the Engineer and/or Owner personnel. The test forms shall be completed by the testing person for field checkout, testing, and calibration of all equipment and instruments.

   a. All filled in test forms shall be given to the Engineer and/or Owner the day of the test. Fill in two sets of test forms if Contractor wants to keep a copy.

b. All tests shall be documented in writing by the supplier and signed by the Engineer as satisfactory completed. The supplier shall keep a detailed log of all tests that failed or did not meet specifications, including date of occurrence and correction.

c. Completed forms with proper signatures and dates shall be included and become a component of the Operations and Maintenance Manual for each of the respective systems.

d. The Contractor shall notify the Owner and the Engineer of the Supplier's readiness to begin all factory and field tests in writing (a minimum of ten working days prior to start), and shall schedule system checkout on dates agreed to by the Owner and the Engineer in order that the testing be scheduled and witnessed.

e. The Contractor shall fill in & submit for approval the "Scheduled Test Request Form" located in Appendix "A" for each requested inspection, factory and field test.

B. FAILURE TO MEET TEST:

1. Any system material or workmanship which is found defective on the basis of acceptance tests shall be reported to the Engineer. The Contractor shall replace the defective material or equipment and have tests repeated until test proves satisfactory to the Engineer without additional cost to the Owner.

2. If the results of any of tests are unacceptable to the Engineer, the Contractor shall make corrections and perform the tests again until they are acceptable to the Engineer; these additional tests shall be done at no additional cost to the Owner.

3. If testing, installation or configuration work performed is deemed inadequate by Owner or Engineer, then the Contractor shall provide a qualified technician to meet these requirements. No extension of Contract time will be allowed.

4. If Owner Representative determines that the System Set-up is not ready for testing, the Owner Representative reserves the right to cancel the Factory Test as the equipment is found to be not fully and completely ready for factory testing. The Contractor shall be responsible for paying for the Owner and Engineer to return for the factory testing when it has been cancelled.

C. SAFETY

1. Testing shall conform to the respective manufacturer's recommendations. All manufacturer's safety precautions shall be followed.

2. The procedures stated herein are guidelines for the intended tests, the Contractor shall be responsible to modify these tests to fit the particular application and ensure personnel safety. Absolutely no tests shall be performed that endanger personal safety.

3. The Contractor shall have two or more personnel present at all tests.

4. Two non-licensed portable radios are to be made available by the Contractor for the testing organization to conduct tests.

5. California Electrical Safety Orders (ESO) and Occupational Safety and Health Act (OSHA): The Contractor is cautioned that testing and equipment shall comply with ESO and OSHA as to safety, clearances, padlocks and barriers around electrical equipment energized during testing.

6. Field inspections and pre-energization tests shall be completed prior to applying power to equipment.

D. ELECTRICAL FACTORY TEST

1. The System supplier shall conduct a thorough and complete factory test by qualified factory-trained personnel witnessed by Owner per the criteria specified herein. Factory test shall be held within 150 miles of project location.
2. The “System set-up” for factory testing shall consist of, but is not limited to pedestal, OI, Control Panel, PLC, temporary SCADA server with SCADA program, and any miscellaneous associated electrical equipment or panels.
3. Temporary wiring and equipment shall be setup during these tests to simulate the complete assembled system.
4. Original PLC/OI/SCADA programmer shall be present during the entire Factory Test for modifying or adjusting all PLC registers, SCADA application and setpoints to test the system.
5. The length of the factory testing for the “System setup” shall be a minimum of one (1) working days. If in the opinion of the Owner or Engineer the factory testing is not completed at the end of the working day, the testing shall be extended, at no additional cost to the Owner or extension in Contract time. The Contractor shall agree that the sum set forth hereafter is a reasonable amount to be charged as liquidated damages; and it is therefore agreed that the Contractor will pay the Owner the sum of one thousand five hundred dollars ($1,500.00) in liquidated damages for each and every calendar day beyond the time prescribed above for the completion of factory testing for the System set-up. Liquidated damages will be assessed to the Contractor each and every day past the time allotted for factory testing.
6. All factory tests shall be conducted at the Supplier’s facility. All factory tests shall be completed prior to shipment of any of the “System set-up” to the jobsite. The “System set-up” shall be fully assembled, programmed, and connected as it will be installed in the final configuration. If the “System set-up” is found to be not fully and completely ready for factory testing, the Contractor shall be responsible for paying for the Owner and Engineer to return for the factory testing. Factory testing is to ensure that there are no defects. The hardware and software shall be tested for compliance with the plans and Specifications included herein and for the ability to perform the control functions.
7. All components of the system setup shall be completely assembled and thoroughly pre-tested by the supplier or manufacturer before start of factory test.
8. Provide a complete clean copy of System Supplier drawings for Owner and Engineer’s use during Factory Test prior to starting the tests. These drawings shall reflect the equipment being tested.
    a. If Owner Representative determines that these drawings do not adequately reflect the actual equipment being tested or differs substantially from the approved equipment submittal, the Owner Representative reserves the right to cancel the Factory Test as the equipment is found to be not fully and completely ready for factory testing.

b. Equipment that differs substantially from the approved equipment submittal shall be resubmitted. Factory test will be rescheduled after revised submittals have been reviewed by the Engineer and marked "No Exceptions Taken" or "Make Corrections Noted".

c. No extension of Contract time will be allowed. Cancellation and rescheduling of factory tests shall occur at no additional costs to Owner

d. The Contractor shall be responsible for paying for the Owner and Engineer to return for the factory testing when it has been cancelled.

9. The associated factory tests for each of the factory testing sheets that are to be performed by the supplier and witnessed by the Owner/Engineer shall include the following for the “System set-up” as a minimum:

   a. Inspections of the panels as follows:

      1) Visual and Mechanical:

         a) Inspect for physical damage, proper support, and wiring.

         b) Check all starters, breakers, and other components for proper sizes.

      2) The Contractor shall fill in test form TF4 located in Appendix “A”.

   b. Testing of the Equipment as follows:

      1) Each line of control logic on the elementary or loop diagrams shall be checked. After a line of control logic is tested, the person performing test shall initial or highlight the corresponding line on the elementary diagram. When the complete elementary diagram has been checked, it shall be signed and dated by testing person and person witnessing test.

      2) I/O points to terminal blocks shall be simulated for the complete checkout of PLC interfaces.

      3) The tests, as a minimum, shall simulate all operating conditions including steady state, transients, upsets, startup, shutdown, power failure, and equipment failure conditions (for control logic).

      4) The Contractor shall complete each test and fill in the I/O test form TF13 located in Appendix “A”.

   c. Testing of Control as follows:

      1) To facilitate testing and system simulation of the “System Set-up”, the Supplier shall connect a separate toggle two position on-off switch to each status and alarm digital input. Three digital multi-meters (minimum +/- 0.2% accuracy) with clip-on leads shall be supplied and utilized during testing for measurement of digital and analog outputs. The supplier shall use simulated input signals to replicate varying field device signals during the factory tests in order to verify the proper functioning of hardware and software.

   d. The structured factory tests to be performed by the System Supplier and witnessed by the Owner shall include the following as a minimum:

      1) Control Checkout Tests: Simulate the digital or analog signals (or combination thereof) at the panel field terminals using the test hardware to verify that each control is functional and properly configured. Verify that all parameters (i.e., relay logic operations, relay timing, controller setpoints, etc.) of the control system are defined and operate according to the design documents.

2) Alarm Checkout Tests: Simulate the digital or analog signals (or combination thereof) at the panels using the test hardware to verify that each I/O point is functional and properly configured. Verify that all parameters (i.e., description, engineering units, span, enable/disable, setpoints, runtimes, totalization, logic type, etc.) of the alarms are defined and operate according to the Specifications.

e. Unstructured factory tests are required as part of the factory testing phase. These additional tests shall include any and all unstructured tests as directed by the Owner or Engineer. The various unstructured tests shall include, but are not limited to, the following:

1) Verify the correct inventory of hardware, etc. All spare parts shall be included in the inventory.

2) The factory tests, as a minimum, shall simulate all normal and abnormal operating conditions including steady state, change of state, variable changes, fluctuations, transients, upsets, start-up, shutdown, power failure, and equipment failure conditions.

10. The factory test will be considered complete only when the integrated system has successfully passed all tests to the satisfaction of the Owner or Engineer and the Factory Test checkout form TF11 has been signed & dated by Owner. No electrical equipment shall be shipped to jobsite without authorization from the Owner or Engineer that the factory test has been completed. Equipment that were shipped to the jobsite without authorization shall be shipped back to the System Supplier for witness testing at no additional cost to Owner.

11. Acceptance and witnessing of the factory tests does not relieve or exclude the Contractor from conforming to the requirements of the Contract Documents.

12. The testing personnel shall provide all material, equipment, labor and technical supervision to perform such tests and inspections.

13. During the testing period, under the supervision of the supplier, the Engineer and other Owner personnel shall have unlimited and unrestricted access to the usage and testing of all hardware and software in the system.

14. Spare parts, including spare I/O for the system shall also be tested during this test period. The supplier shall prove by temporarily connecting the spare hardware to the system that any or all of the spare parts function in a manner equivalent to the original equipment under test.

15. The Contractor shall pay all expenses incurred by his personnel which includes labor, material, transportation, lodging, daily subsistence, and other associated incidental costs during the factory testing.

16. Faulty and/or incorrect hardware operation of major portions of the system may, at the discretion of the Owner Engineer, be cause for suspension or restarting of the entire factory test, at no additional cost to the Owner or extension in contract time.

17. The factory test will be considered complete only when the system setup has successfully passed all tests both structured and unstructured to the satisfaction of the Owner Engineer. No equipment shall be installed without authorization from the Owner Engineer that the factory test has been completed.

18. All modifications to drawings and documentation as a result of the factory tests shall be corrected and completed before shipment of drawings with equipment and the submittal and delivery of “operation and maintenance” manuals.
19. Copies of the completed, signed, and witnessed factory testing forms shall be placed in the Operation and Maintenance Manual.

E. Electrical Field Tests

1. The Contractor shall engage and pay for the services of an approved qualified testing company for the purpose of performing inspections and tests as herein specified. The testing company shall provide all material, equipment, labor and technical supervision to perform such tests and inspections. The Electrical Contractor shall be present on site for all field tests.
2. Prior to start of any field testing, the Field Test Procedures, Interconnection Drawings and Preliminary Operation and Maintenance Manuals shall have been submitted by the Contractor and approved by the Engineer. Also, prior to start of field testing of equipment, correct machine printed wire labels shall be in place on all wires associated with that equipment.
3. The Electrical Contractor shall complete and submit “Schedule Test Request Form” as illustrated in Appendix “A” for each electrical field test.
4. The Electrical Contractor shall be at the jobsite to assist with all Electrical Field Tests.
5. Pre-Energization Tests: These tests shall be completed prior to applying power to any equipment.
    a. Inspections:
        1) Visual and mechanical inspections:
            a) Inspect for physical damage, proper anchorage and grounding.
            b) Compare equipment nameplate data with design plans and starter schedule.
            c) Compare overload setting with motor full load current for proper size.
        2) Performed NETA acceptance testing for each piece of equipment.
        3) The Testing Company shall compile, by visual inspection a record of all motor nameplate data, the following minimum data shall be neatly tabulated in spreadsheet form and submitted to Owner:
            a) Manufacturer
            b) Part and model number
            c) Equipment driven
            d) Motor horsepower
            e) Nameplate amperes, volts and phase
            f) Service factor
            g) Temperature ratings
            h) Overload catalog number
            i) Overload current range and setting
            j) Circuit breaker rating

k) Circuit breaker trip setting, for magnetic only circuit breakers.

4) The Contractor shall fill in, for each piece of equipment, Test Form TF4 located in Appendix “A”.

b. Torque Connections:

1) All electrical, mechanical and structural threaded connections inside equipment shall be tightened in the field after all wiring connections have been completed. Every worker tightening screwed or bolted connections shall be required to have and utilize a torque screwdriver/wrench at all times. Torque connections to the value recommended by the equipment manufacturer. If they are not available, use NEC Annex I for torque values as guidelines.

c. Wire Insulation & Continuity Tests:

1) All devices that are not rated to withstand the 500V megger potential shall be disconnected prior to the megger tests.

2) Megger insulation resistances of all 600 volt insulated conductors using a 500 volt megger for 10 seconds. Make tests with circuits installed in conduit and isolated from source and load. Each field conductor shall be meggered conductor to conductor and conductor to ground. These tests shall be made on cable after installation with all splices made up and terminators installed but not connected to the equipment.

3) Each megger reading shall not be less than 10 Meg-ohms resistive. Corrective action shall be taken if values are recorded less than 10 Meg-ohms. Values of different phases of conductors in the same conduit run showing substantially different Meg-ohm values, even if showing above 10 Meg-ohms shall be replaced.

4) Each instrumentation conductor twisted shielded pair shall have the conductor and shield continuity measured with an ohmmeter. Conductors with high ohm values, that do not match similar lengths of conductors the same size, shall be replaced at no additional cost to the Owner.

5) The Contractor shall fill in test forms Power and Control Conductor Test Form TF1 and Instrumentation Conductor Test Form TF2 located in Appendix “A”.

d. Grounding System Tests:

1) Visual and Mechanical Inspection:

a) Verify ground system is in compliance with Drawings and Specifications.

2) Electrical Tests:

a) Before backfilling trenches, and placement of sidewalks, landscape and paving, measure the resistance of each electrode to ground using a ground resistance tester. Perform the test not less than two days after the most recent rainfall and in the afternoon after any ground condensation (dew) has evaporated.

b) After all individual ground electrode readings have been made, interconnect as required and measure the system’s ground resistance.

c) The grounding test shall be in conformance with IEEE Standard 81.

d) The current reference rod shall be driven at least 100 feet from the system under test.

e) Measurements shall be made at 10 feet intervals beginning 25 feet from the test electrode and ending 75 feet from it in a direct line between the system being tested and the test electrode.

f) Point-to-Point: Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral, and/or derived neutral points.

3) Test Values:

a) The resistance between the main grounding electrode and equipment ground shall be no greater than five ohms per IEEE Standard 142.

b) Investigate point-to-point resistance values that exceed 0.5 ohms.

c) The Contractor shall fill in Grounding System Test Form TF3 located in Section 16010 Appendix “A”.

d) Plots of ground resistance shall be made and submitted to the Engineer for approval.

e. Panelboard Tests

1) Visual and Mechanical Inspection:

a) Inspect for physical damage, proper anchorage and grounding.

b) Compare equipment nameplate data with design plans and panelboard schedules.

c) Compare breaker legend for accuracy.

d) Check torque of bolted connections.

2) The Contractor shall fill in Panelboard Test Form TF5 located in Appendix “A”.

f. Breaker Test:

1) All breakers shall be checked for proper mounting, conductor size, and feeder designation. Operate circuit breaker to ensure smooth operation. Inspect case for cracks or other defects. Check tightness of connection with torque wrench in accordance with manufacturer’s recommendations.

2) All MCPs and breakers 100 amps and above shall be tested. Time current characteristic tests shall be performed bypassing three hundred percent (300%) rated current through each pole separately. Trip amps and time shall be measured. Instantaneous pickup current shall be determined by run up or pulse method. Clearing times should be within four (4) cycles or less. All trip times shall fall within NETA Table values. Instantaneous pickup current levels should be within 20% of manufacturer’s published values.

3) Contact and Insulation Resistance: Contact resistance shall be measured and be compared to adjacent poles and similar breaker. Deviations of more than 50% shall be reported to Engineer. Insulation resistance shall be measured and shall not be less than 50 megohms.

4) At end of test the all breakers trip settings shall be set by Contractor to values listed in protective device coordination study to properly protect equipment.

5) The Contractor shall fill in mcc Device Test Form TF8 and Breaker Test Form TF9 located in Appendix “A”.

6. Post Energization Tests
    a. Panels and Enclosure Tests:
        1) During these tests, test all local and remote control operations and interlocks.
        2) Electrical Tests:
            a) Perform operational tests by initiating control devices to affect proper operation.
            b) The Contractor shall fill in Operational Device Checks and Tests Form TF6.
    b. Phase Rotation Tests:
        1) Check connections to all equipment for proper phase relationship. During this test, disconnect all devices which could be damaged by the application of voltage or reversed phase sequence. Three phase equipment shall be tested for the phase sequence “ABC” front to back, left to right, and top to bottom.
        2) All three phase motors shall be tested for proper phase rotation. Revise wire color codes to indicate correct phase color if wires are swapped.
        3) The Contractor shall fill in Phase Rotation Test Form TF7 located in Appendix “A”.
    c. Motor Testing:
        1) Record the amperage draw on all phases of each motor operating under full load. Ensure that these values do not exceed the motor nameplate full load amperage.
        2) Record the voltage between all phases of each motor operating under full load. If the voltage balance is not within plus or minus 5 percent of nominal, request the Utility power company or other responsible party to correct the problem.
        3) Record the Ohm’s on phase to phase with low Ohms tester.
        4) The Contractor shall compile, by visual inspection of equipment installed for each motor, the following data in neatly tabulated form and be placed in the O&M manual:
            a) Equipment driven.
            b) Motor horsepower.
            c) Nameplate amperes.
            d) Service factor.
            e) Temperature rating.
            f) Overload catalog number.
            g) Overload current range and setting.
            h) Circuit breaker rating.
            i) Circuit breaker trip setting, for magnetic only circuit breakers.
        5) The Contractor shall fill in Motor Test Form TF10, located in Appendix “A.”
        6) Additional motor testing requirements per Division 11.
    d. Radio Configuration & Testing:
        1) The Contractor shall install the antenna system per the radio manufacturer’s Installation Operation and Field Maintenance Manual. The Contractor shall pay for the services of radio manufacturer’s qualified Radio Technician to perform the Setup and Field Tests and perform any of the manufacturer’s

recommendations based on the results of the tests. The Contractor shall notify the Owner or the Owner's representative one week in advance of the test in order to have all setup, tests, and adjustments performed by the Radio Technician witnessed by the Owner. The Contractor shall fill in Radio Test Report TF15 located in Appendix "A" and submitted to the Owner.

e. Instrumentation Tests
   1) The Contractor shall provide a minimum of two (2) hours of field acceptance testing for each instrument. If any instrument has not been fully tested during its allotted time, the Contractor shall provide additional hours for finishing testing of the instrument, to be paid by the Contractor.
   2) The overall accuracy of each instrument loop shall be checked to ensure that it is within acceptable tolerance.
      a) As a minimum, all the tests indicated/specified on the test form TF14 in Appendix "A" shall be performed by the Contractor for each of the instruments listed in Appendix "B" Device Index.
   3) Test equipment used for testing shall be of suitable quality so as not to mask performance deficiencies. All test equipment shall be traceable to National Bureau of Standards and have been calibrated within six months of test date.
   4) Testing shall be accomplished using simulated inputs only with prior written approval of the Owner.
   5) Calibration stickers shall be supplied for all equipment and instruments. Calibration stickers shall list the following information:
      a) Tag number.
      b) Calibrated by who (name), firm, city and telephone number.
      c) Date calibrated.
      d) Calibration range.
      e) Comments.

f. Control System Tests: The following tests shall be performed for all MCCs and for the control panels listed in Section 16010 Appendix "B", including all non-Division 16 Control Panels.
   1) Component Tests:
      a) Measure insulation resistance of starter phase to phase and phase to ground with the starter contacts closed and the protective device open. Test voltage and minimum acceptable values shall conform to NETA Section 3 "Test Values." Measure insulation resistance of each control circuit with respect to ground.
      b) Motor overload units shall be tested by injecting primary current through overload unit and monitoring trip time.
      c) Test the motor circuit protectors and thermal breakers as specified herein.
   2) Control Tests:
      a) Remove motor overload heaters from each motor starter or disconnect pump/motor coupling. In case the motor overload heaters are fed by current transformers, the motor conductors shall be removed and insulated away from the load lugs of the motor starter.

b) Verify the pump control circuits are wired and operate as shown on the elementary diagrams. Check the indicator lights, alarm lights, local & remote selector switches, alarm contacts, power fail relays, overloads, etc., for proper operation.

c) Reinstall all heaters and all wiring removed for this test.

g. PLC Control System Tests:

1) All the I/O points for the PLC shall be tested by the system supplier in the field for proper operation of alarms, status, analog, control, and display functions. Where practical, the final element shall be used, i.e. trip the intrusion switch or change levels. Testing shall be accomplished using simulated inputs only when necessary.

2) During this task the System supplier shall have:

a) Qualified field technician with experience in the startup of similar systems with PLC controls, and other field devices.

b) Original PLC/OI/SCADA programmer(s) for modifying or adjusting all PLC registers and setpoints to tune the system.

c) Test instruments as required.

d) A pair of radios for communication.

e) Laptop loaded with diagnostic, configuration, programming PLC software. The latest application programs shall have been loaded on the PLC.

3) Contractor to fill in “I/O Point Checkout Sheet” TF13 located in Appendix “A”.

h. Trial Operations: The entire electrical installation shall be either tested or trial operated to verify Contract compliance. That is, controls, heaters, fans, light switches, convenience receptacles, lights, etc. shall be trial operated. Contractor shall conduct trial operations in the presence of the Engineer and Operations and Maintenance personnel.

F. Operational Testing:

1. After all the previous tests in this subsection 3.07 and 3.08 are complete, the Contractor shall conduct operational testing.

2. The Contractor shall demonstrate the operation of each part of the control and instrumentation system to the satisfaction of the Owner and/or Engineer. Tests shall be repeated by the Contractor at no additional cost to the Owner and at the discretion of the Owner and/or Engineer to resolve whether the system has demonstrated that it will operate under all modes of operations and varying conditions.

3. For the operational testing the new equipment shall be activated to automatically run for 5 days, 24 hours per day, Monday through Friday. During this five day period, the Owner will run the different combinations of the monitoring options. If equipment failure occurs during the 5 days of operational testing, the Contractor shall repair or replace the defective equipment and shall begin another 5 day operational test, Monday through Friday. This shall be continued until the new equipment functions acceptably for 5 consecutive days.

4. The Electrical Contractor, testing firm and System Supplier shall re-visit the jobsite as often as necessary until all field tests, start-up and operation tests are completed and approved.

3.09 OPERATION AND MAINTENANCE MANUALS

A. Operation and maintenance manuals covering instruction and maintenance on each type of equipment shall be furnished prior to completion of the project.

B. These instructions shall provide the following as a minimum:

1. Each set bound in a three ring binder and organized as specified herein. Binder shall be sized such that when all material is inserted the binder is not over 3/4 full
2. “As Constructed” set of submittal shop documents, data sheets, and drawings (with all field changes included) for all items in the electrical system.
3. A complete list of items supplied, including serial numbers, ranges, options, and other pertinent data necessary for ordering replacement parts.
4. Full technical specifications on each item.
5. Instrument data sheets for all instruments supplied on the project, clearly identifying the instrument tagname, range, part number, serial number, size, etc.
6. Detailed service, maintenance and operation instructions for each item supplied. Schematic diagrams of all electronic devices shall be included. A complete parts lists with stock numbers shall be provided on the components that make up the assembly.
7. Special maintenance requirements particular to this system shall be clearly defined, along with special calibration and test procedures.
8. Safety precautions and procedures.
9. Record of the following:
    a. Each motor nameplate data including manufacturer, full part number, size, voltage, amps, service factor, bearings, etc.
    b. Each breaker and overload heater element including manufacturer, full part number, size, setting etc.
    c. Spread sheet listing all setpoints and programmable parameters entered for this project for VFD, UPS, HIM, etc.
10. No photo copies are allowed of standard published manuals available from manufacturers such as for the PLC. All of the manuals shall be originals, not copies.
11. Software program & documentation including complete as-installed PLC ladder logic, and PLC configuration printouts.
12. Include all completed and signed test data and forms from factory and field testing.
13. Warranty certificate with start dates, duration and contact information.
14. Troubleshooting instructions.
15. Record of all settings or parameters for all programmable devices.

C. At the end of the project these manuals shall be updated to show “as-built or as-installed” conditions.

D. Provide to the Owner four (4) sets of USB drives on lanyards and two sets of DVDs (DVDs shall contain all documents in both PDF format and unlocked AutoCAD - DWG format, version 2010 or later):

1. As-built Contract electrical and instrumentation drawings prepared for this project.
2. As-built set of all required Drawings for the project.
3. As-built sets of other computer generated documents prepared for this project, including PLC ladder logic files, and Bill of Materials prepared for this project.
    a. Software ladder logic programs
    b. Software OI programs
    c. Software SCADA configuration
4. Electronic PDF version of O&M manual. Version format shall follow the hard copy submittal of the O&M, including index, equipment record sheet, warranty information, theory of operation, maintenance instruction, etc. PDF shall "bookmarked" to at each index and subtab listed in O&M.
5. These disks shall be the property of the Owner, for its use on this and future projects.
6. Label drives with site name using white plastic with black machine printed lettering as produced by a KROY or similar machine. The size of the nameplate tape shall be with 3/8-inch lettering unless otherwise approved by the Engineer. Securely fasten nameplates in place on the USB drive using the adhesion of the tape.

3.10 TRAINING

A. All training sessions shall be held on dates and times agreeable to Owner. A total of 5 or fewer Owner personnel shall be trained.

B. After "Operation Testing" has started the Contractor shall provide a period of not less than 8 hours training for instruction of operation and maintenance personnel in the use of all the new electrical and instrumentation systems. The Contractor shall make necessary arrangements with manufacturer's representative. Provide product literature and application guides for user's reference during instruction.

C. Provide 16 hours (minimum) additional, "Operator" hands on SCADA and Operator Interface training. Training shall also include training on the new Operator Interfaces.

D. Training to include instruction on the use, operation, calibration, programming, and maintenance of the field devices listed in Appendix "B".

E. Acceptable Operation and Maintenance Manuals shall be on site and available when training sessions are implemented.

F. See the following sections for additional training requirements:

1. Section 16605 – Electrical System Analysis.

3.11 SPARE PARTS

A. The Contractor shall supply all spare parts prior to start of field tests. All parts shall be sealed in plastic bags and delivered to each site in a heavy duty plastic storage bag. Bag shall be clearly labeled on the outside with part name and number and the corresponding equipment tagname.

B. The Contractor shall make available any replacement parts that are not manufacturer's normal stock items for immediate service and repair of all the instrumentation equipment throughout the warranty period.

C. The following spare parts shall be provided to the Owner as part of this Contract for each site:

   1. Five (5) fuses for each type of fuse.
   2. Five (5) lamps for each type of light.
   3. Two (2) relays for each type of control, power fail and time delay relay.
   4. One (1) spare Ethernet switch.

D. See other division 16 sections for additional spare parts to be provided.

3.12 WARRANTY

A. The Contractor shall warrant all electrical and instrumentation equipment including software programming for a period of one (1) year from date of final acceptance. Standard published warranties of equipment which exceed the preceding specified length of time shall be honored by the manufacturer or supplier.

B. The Contractor shall provide all labor and material to troubleshoot, replace, or repair any hardware or software that fails or operates improperly during the warranty period, at no additional cost to the Owner.

C. The System Supplier shall have a staff of experienced personnel available to provide service on 2 working days' notice during the warranty period. Such personnel shall be capable of fully testing and diagnosing the hardware and software and implementing corrective measures.

D. If the System Supplier "fails to respond" in 2 working days, the Owner at its option will proceed to have the warranty work completed by other resources; the total cost (direct and indirect) for these other resources shall be reimbursed in full by the Contractor.

   1. "Fail to respond" shall be defined as: The Contractor has not shown a good faith effort and has not expended adequate resources to correct the problem.
   2. The use of other resources, as stated above, shall not change or relieve the Contractor from fulfilling the remainder of the warranty requirements.

E. The Contractor shall warrant all electrical and instrumentation equipment including PLC software programming for a period of one (1) year from date of final acceptance. Standard

published warranties of equipment which exceed the preceding specified length of time shall be honored by the manufacturer or supplier.

F. Software support which shall be provided by System Supplier:

1. Free technical PLC / OI software and hardware configuration phone support for a period of one year. PLC / OI phone support shall be provided directly from the group that configured the PLC / OI. Phone support shall be available between 8 a.m. and 4 p.m., Pacific Standard Time, Monday through Friday.
2. The supplier shall correct any PLC / OI software configuration error that is discovered within the warranty period, at no additional cost to Owner. Updated documentation for each "operation and maintenance" manual and new floppy disks of updated software shall be provided for each correction.
3. Program changes made by Owner or under direction of Owner by others shall not relieve or void Contractor of warranty requirements for parts of software programmed under this Contract.

G. Prior to “final acceptance”, the Contractor shall furnish to the Engineer a listing of warranty information for all manufacturers of materials, instruments, and equipment used on the project. The listing shall include the following:

1. Manufacturer’s name, service contact person, phone number, and address.
2. Material and equipment description, equipment number, part number, serial number, and model number.
3. Manufacturer’s warranty expiration date.

H. The Contractor shall provide all labor and material to troubleshoot, program, replace, or repair any hardware or software that fails or operates unpredictably during the warranty period, at no additional cost to the Owner.

I. Each time the Supplier’s repair person responds to a system malfunction during the warranty period, he or she must contact the designated Owner maintenance supervisor for scheduling of the work, access to the jobsite, and permission to make repairs. Operation of facilities necessary to test equipment shall only be performed by or under the direction Owner staff. Owner reserves the right at its sole discretion to deny operations requested by the Supplier. A written description of all warranty work performed shall be documented on a field service report to be given to Owner prior to the repair person leaving job site. This field service report shall detail and clearly state problem, corrective actions taken, additional work that needs to be done, data, repair person name and company.

3.13 FINAL ACCEPTANCE

A. Final acceptance will be given by the Owner after the equipment has passed the “operational testing” trial period, each deficiency has been corrected, final documentation has been provided, and all the requirements of design documents have been fulfilled.

B. At the end of the project, following the completion of the field tests, and prior to final acceptance, the Supplier shall:

1. Remove all temporary services, equipment, material and wiring from the site.
2. Verify Service equipment has been legibly marked in field with the maximum available fault current per NEC 110.24 (A). Field marking shall include date the fault current calculation was performed and be weather & UV rated. Service equipment shall not be hand labeled.
3. Two sets of all keys for locks supplied on this project. Submit each key with matching duplicate. Wire all keys for each lock securely together. Tag and plainly mark with lock number or equipment identification, and indicate physical location, such as panel or switch number.
4. Verify that as-installed drawings, in reinforced clear plastic pockets, have been placed in all new or modified panels.
5. Resubmit all Electrical System Analysis studies with all calculations rerun, data and graphs updated to reflect as-left conditions. Provide new Arc Flash labels to reflect as-constructed equipment and as-left circuit breaker settings.
6. Provide the following to the Owner:
    a. Listing of warranty information.
    b. Two (2) Electrical Systems Analysis DVDs of as-built set of studies, reports, settings, etc. and source files per Section 16605.
    c. Each "operation and maintenance" manual shall be modified or supplemented by the Supplier to reflect all field changes and as-built conditions.
    d. O&M documentation as specified herein.
    e. At least one set of manuals, all software, disks and required programming cables shall be turned over to the Owner’s SCADA/Electrical division.

APPENDIX "A"

ELECTRICAL & INSTRUMENTATION FORMS

Index of Forms:

BILL OF MATERIAL

PROJECT: ______________________________ **DATE** ___/___/___

LOCATION: ______________________________ **PAGE** ________

SPECIFICATION SECTION	QTY	DESCRIPTION	MFG.	PART NUMBER	TAG No.

SCHEDULED TEST REQUEST FORM

COMPANY PERFORMING TEST: _____
TESTING PERSONNEL : _____ _____
PHONE NUMBER OF COMPANY: _____
TEST PROCEDURE SUBMITTAL: _____ APPROVED : ___/___/___
SCHEDULED TEST DATE : _____ DATE : ___/___/___

TIME	DESCRIPTION OF TEST
8:00	
9:00	
10:00	
11:00	
12:00	
13:00	
14:00	
15:00	
16:00	

NOTES:

TESTED BY : _____ DATE : ____/____/____
WITNESSED BY: _____

POWER AND CONTROL CONDUCTOR TEST FORM

TEST FORM (TF1)

EQUIPMENT

NAME : _____ LOCATION : _____

CALIBRATION EQUIPMENT DATE: _____

DESCRIPTION _____

CONDUCTOR NUMBER	INSULATION TESTS					
	PHASE TO GROUND			PHASE TO PHASE		
	A	B	C	AB	BC	CA

NOTES:
Record insulation test values in meg-ohms.

TESTED BY : _____ DATE : ____/____/____

WITNESSED BY: _____

INSTRUMENTATION CONDUCTOR TEST FORM

TEST FORM (TF2)

EQUIPMENT

NAME : _____ LOCATION : _____

CALIBRATION EQUIPMENT DATE: _____

DESCRIPTION : _____

CONDUCTOR PAIR NUMBER	CONTINUITY TESTS		INSULATION TESTS		
	CONDUCTOR TO CONDUCTOR	CONDUCTOR TO SHIELD	CONDUCTOR TO CONDUCTOR	CONDUCTORS TO GROUND*	SHIELD TO GROUND

NOTES:

Record continuity test values in ohms.

record insulation test values in meg-ohms.

* With both conductors tied together

TESTED BY : _____ DATE : ____/____/____

WITNESSED BY: _____

GROUNDING SYSTEM TEST FORM

TEST FORM (TF3)

CALIBRATION EQUIPMENT DESCRIPTION : DATE: _____

FALL IN POTENTIAL TEST

MAIN GROUND LOCATION	APPLIED VOLTAGE V	MEASURED POINT 1 VOLTAGE	MEASURED POINT 2 VOLTAGE	MEASURED POINT 3 VOLTAGE	CALCULATED RESISTANCE OHMS

TWO POINTS TESTS

EQUIPMENT NAME	EQUIPMENT #	CIRCUIT #	APPLIED CURRENT	MEASURED VOLTAGE	CALCULATED RESISTANCE OHMS

NOTES:

TESTED BY : _____ DATE : ____/____/____

WITNESSED BY: _____

VISUAL AND MECHANICAL INSPECTION FORM

TEST FORM (TF4)

EQUIPMENT

NAME : _____ LOCATION : _____

NAMEPLATE DATA

MFGR. :	_____	SERIES # :	_____
MODEL # :	_____	U.L. # :	_____
VOLTAGE :	_____	PHASE :	_____
AMPERAGE :	_____	SERVICE :	_____
BUS TYPE :	_____	BUS BRACING:	_____
VERT. BUS :	_____	HORZ. BUS :	_____
GND. BUS :	_____	NEU. BUS :	_____
ENCLOSURE :	_____		_____
	_____		_____

INSPECTION CHECK LIST

ENTER: A-ACCEPTABLE R-NEEDS REPAIR OR REPLACEMENT NA-NOT APPLICABLE

TIGHTEN ALL BOLTS AND SCREWS	_____
TIGHTEN ALL WIRING AND BUS CONNECTIONS	_____
VERIFY ALL BREAKERS AND FUSES HAVE PROPER RATING	_____
CHECK BUS BRACING AND CLEARANCE	_____
CHECK MAIN GROUNDING CONNECTION AND SIZE	_____
INSPECT GROUND BUS BONDING	_____
CHECK EQUIPMENT GROUNDS	_____
CHECK CONDUIT GROUNDS AND BUSHINGS	_____
INSPECT NEUTRAL BUS AND CONNECTIONS	_____
CHECK HEATERS AND THERMOSTATS	_____
CHECK VENTILATION AND FILTERS	_____
CHECK FOR BROKEN OR DAMAGED DEVICES	_____
CHECK DOOR AND PANEL ALIGNMENT	_____
INSPECT ANCHORAGE	_____
CHECK FOR PROPER CLEARANCES AND WORKING SPACE	_____
REMOVE ALL DIRT AND DUST ACCUMULATION	_____
INSPECT ALL PAINT SURFACES	_____
CHECK FOR PROPER WIRE COLOR CODES	_____
INSPECT ALL WIRING FOR WIRE LABELS	_____
CHECK FOR PROPER WIRE TERMINATIONS	_____
CHECK FOR PROPER WIRE SIZES	_____
INSPECT ALL DEVICES FOR NAMEPLATES	_____
CHECK IF DRAWINGS MATCH EQUIPMENT	_____
CHECK ACCURACY OF OPERATION & MAINTENANCE	_____
	_____

TESTED BY : _____ DATE : ____/____/____

WITNESSED BY: _____

PANEL-BOARD TEST FORM

TEST FORM (TF5)

PANEL NAME: _____ LOCATION : _____

NAMEPLATE DATA

MFGR. :	_____	SERIES # :	_____
MODEL # :	_____	U.L. # :	_____
VOLTAGE :	_____	PHASE :	_____
AMPERAGE :	_____	SERVICE :	_____
BUS TYPE :	_____	BUS BRACING:	_____
VERT. BUS :	_____	HORZ. BUS :	_____
GND. BUS :	_____	NEU. BUS :	_____
ENCLOSURE :	_____	MAIN BKR :	_____

CALIBRATION EQUIPMENT DATE: _____
DESCRIPTION :

INSULATION RESISTANCE TESTS - MEGOHMS					
A-GND	B-GND	C-GND			

INSPECTION CHECK LIST

ENTER: A-ACCEPTABLE R-NEEDS REPAIR OR REPLACEMENT NA-NOT APPLICABLE

TIGHTEN ALL BOLTS AND SCREWS	_____
TIGHTEN ALL WIRING AND BUS CONNECTIONS	_____
VERIFY ALL BREAKERS AND FUSES HAVE PROPER RATING	_____
CHECK BUS BRACING AND CLEARANCE	_____
CHECK MAIN GROUNDING CONNECTION AND SIZE	_____
INSPECT GROUND BUS BONDING	_____
CHECK EQUIPMENT GROUNDS	_____
CHECK CONDUIT GROUNDS AND BUSHINGS	_____
INSPECT NEUTRAL BUS AND CONNECTIONS	_____
CHECK FOR BROKEN OR DAMAGED DEVICES	_____
CHECK DOOR AND PANEL ALIGNMENT	_____
INSPECT ANCHORAGE	_____
CHECK FOR PROPER CLEARANCES AND WORKING SPACE	_____
REMOVE ALL DIRT AND DUST ACCUMULATION	_____
INSPECT ALL PAINT SURFACES	_____
CHECK FOR PROPER WIRE COLOR CODES	_____
INSPECT ALL WIRING FOR WIRE LABELS	_____
CHECK FOR PROPER WIRE TERMINATIONS	_____
CHECK FOR PROPER WIRE SIZES	_____
INSPECT ALL DEVICES FOR PROPER LEGEND NAMEPLATES	_____
	_____

CALIBRATION TEST EQUIPMENT PART NO.	DATE CALIBRATED:

TESTED BY : _____ DATE : ____/____/____

WITNESSED BY: _____

OPERATIONAL DEVICE CHECKS AND TESTS FORM

TEST FORM (TF6)

NAME : _____ LOCATION : _____

CUB. #	EQUIPMENT NAME	EQUIP #	LOCAL SITE DEVICE CHECKS AND TESTS							REMOTE SITE DEVICE CHECKS & TESTS		
			SELECTOR SWITCH	INDICATOR LIGHTS	PUSHBUTTON & LOS	METERING & INDICATORS	OVERLOAD RESET	INTERLOCKS & CONTROL	ALARM & STATUS	SELECTOR SWITCH	INDICATOR LIGHTS	PUSHBUTTON & LOS

TESTED BY : _____ DATE : ____/____/____

WITNESSED BY : _____

NOTES:

PHASE ROTATION TEST FORM

TEST FORM (TF7)

EQUIPMENT NAME	EQUIPMENT #	CIRCUIT #	PHYSICAL PHASE LOCATION	PHASE COLOR CODE	MEASURED PHASE ROTATION

NOTES:
Use phase tester to verify all circuits and equipment have a clockwise A-B-C phase rotation.
Physical phase locations: Left to Right - LR or Top to Bottom - TB
Phase color codes: Brown, Orange, & Yellow -BOY
Black, Red, & Blue -BkRBe

TESTED BY : _____ DATE : ____/____/____
WITNESSED BY: _____

MCC DEVICE TEST FORM

TEST FORM (TF8)

MCC # : _____ CUBICLE : _____

EQUIP NAME: _____ EQUIP # : _____

MOTOR DATA		CONTACTOR DATA			
H.P. :		MFGR. :		PART # :	
F.L.A. :		NEMA SIZE :		COIL VOLT :	

CALIBRATION EQUIPMENT DATE: _____

DESCRIPTION : _____ _____

OVERLOAD TESTS

MFGR. : _____ HEATER # : _____ RANGE : _____

PART # : _____ FINAL OVERLOAD SETTING: _____

TEST AMPS	MEASURE TRIP TIME @ TEST AMPS			MFGR LISTED TRIP TIME	AMBIENT COMPENSATION
	PHASE A	PHASE B	PHASE C		

BREAKER TESTS

MRGR. : _____ PART # : _____ FRAME # : _____

CONTACT RESISTANCE TESTS - OHMS			INSULATION RESISTANCE TESTS-MEGOHMS		
PHASE A	PHASE B	PHASE C	A-GND	B-GND	C-GND

MFGR TRIP TIME @300% MIN:_____ BREAKER RATING / RANGE: _____

MFGR TRIP TIME @300% MAX:_____ FINAL BREAKER SETTING: _____

MFGR INST. PICKUP AMPS: _____

TIME-CURRENT TEST					
TRIP TIME IN SECONDS @ 300% AMPS			INSTANTANEOUS TRIP TEST - AMPS		
PHASE A	PHASE B	PHASE C	PHASE A	PHASE B	PHASE C

NOTES:

TESTED BY : _____ DATE : ____/____/____

WITNESSED BY: _____

BREAKER DEVICE TEST FORM

TEST FORM (TF9)

FEEDER : _____ LOCATION : _____
EQUIP NAME: _____ EQUIP # : _____
EQUIP H.P. : _____ EQUIP KVA : _____

MFGR. : _____ PART # : _____ FRAME # : _____
VOLTAGE : _____ INTERRUPT RATING : _____ CHARACTER CURVE: _____

CALIBRATION EQUIPMENT DATE: _____
DESCRIPTION : _____ _____

CONTACT RESISTANCE TESTS - OHMS INSULATION RESISTANCE TESTS - MEGOHMS

PHASE A	PHASE B	PHASE C	A-GND	B-GND	C-GND

MFGR TRIP TIME @300% MIN : _____ BREAKER RATING / RANGE: _____
MFGR TRIP TIME @300% MAX: _____ FINAL BREAKER SETTING : _____
MFGR INST. PICKUP APMS:

TEST-CURRENT TESTS
TRIP TIME IN SECONDS @ 300% AMPS

PHASE A	PHASE B	PHASE C

INSTANTANEOUS TRIP TEST - AMPS

PHASE A	PHASE B	PHASE C

ADDITIONAL TESTS AND SETTING AS APPLICABLE

FUNCTION	PICKUP RANGE	PICKUP SETTING	DELAY-TIME RANGE	DELAY-TIME SETTING	
LONG TIME					
SHORT TIME					
GROUND FLT.					

NOTES:

TESTED BY : _____ DATE : ____/____/____
WITNESSED BY: _____

MOTOR TEST FORM

TEST FORM (TF10)

EQUIPMENT
NUMBER : _____ NAME : _____

CALIBRATION EQUIPMENT DATE: _____
DESCRIPTION : _____ _____

NAMEPLATE DATA - FIELD RECORDED

MANUFACTURER	MODEL #	SERIAL #	FRAME #

H.P.	R.P.M	F.L.A	VOLTS	PHASE	FREQ.	P.F.	S.F.

CODE	N.E.M.A.	INSUL.	ENCLOSR.	DUTY	DESIGN		

CALIBRATION EQUIPMENT
DESCRIPTION : __ _____ DATE: _____

INSULATION TESTS PHASE TO GROUND MEG-OHMS			MOTOR FRAME GROUNDING SYSTEM TEST			MOTOR HEATER	MOTOR THERMAL
			APPLIED	MEAS.	CALC.	MEAS.	TRIP
A	B	C	VOLTS	AMPS	OHMS	AMPS	TEST

MOTOR TESTS - MEASURED VALUES

AMPERAGE			VOLTAGE			POWER	
A	B	C	AB	BC	CA	FACTOR	WATTAGE

NOTES:
VOLTAGE, AMPERAGE, POWER FACTOR, & WATTAGE SHALL BE RECORDED WITH A TRUE RMS METER.

TESTED BY : _____ DATE : ____/____/____
WITNESSED BY: _____

FACTORY TEST
MCC/CONTROL PANEL CHECKOUT FORM (TF11)

Manufacturer: _____ **Location:** _____

Job No.: _____

Tel: _____ **Fax:** _____

MCC / Control Panel: _____ **TEST RESULT**

	Pass	Fail
OVERALL PANEL INSPECTION		
1. All front panel and back panel components mounted securely.....	☐	☐
2. All wiring terminated and labeled correctly.....	☐	☐
3. All components, wiring, and labeling accurately reflected on the drawings..	☐	☐
POWER-UP INSPECTION		
1. Voltage levels on load side of circuit breakers.....	☐	☐
2. Voltage levels at the DC terminals of the power supply.....	☐	☐
3. Voltage levels at the DC power distribution terminals.....	☐	☐
POWER DISTRIBUTION AND GENERAL COMPONENT TESTING		
1. Power distribution to the appropriate components.....	☐	☐
2. Operation of the ancillary components such as receptacles, work lights, etc.	☐	☐
CONTROL COMPONENTS CHECKS		
1. Operators (push buttons, selector switches, pilot lights).....	☐	☐
2. Inputs from External Sources.....	☐	☐
3. Outputs to External Sources.....	☐	☐
4. Relay Logic.....	☐	☐
5. PLC I/O and Program Verification.....	☐	☐
6. O/I Display Verification.....	☐	☐

Notes:

1. For relay logic checks, each rung of the elementary or loop diagram is to be highlighted in yellow as they are verified for correct control functions.
2. For PLC I/O and program verification, the control strategies shall be highlighted in yellow as each logic function is tested.

Tested by: _____ **Witnessed by:** _____

Date: _____

I/O POINT CHECKOUT TEST FORM

TEST FORM (TF13)

I/O TYPE : _____ LOCATION : _____

TEST EQUIPMENT : _____ CAL. DATE : _____

I/O POINT TAGNAME	I/O POINT ADDRESS	TEST INPUT VALUE %			DISPLAY VALUE %			PLC REGISTER VALUE	TEST RESULT FAIL OR PASS COMMENTS	DATE OF CORRECTIVE ACTION
		0	50	100	0	50	100			

NOTES:

TESTED BY : _____ DATE : ____/____/____

WITNESSED BY: _____

INSTRUMENTATION DATA SHEET AND CALIBRATION RECORD TEST FORM (TF14)

Component Description	Manufacturer	Location
	Name	Site
Component Tag Name	Model	Equip
	Serial #	

	Range	Unit
Indicator Range		
Input Range		
Output Range		

Test Equipent	
Description:	
Calibration Date:	

General Notes

1) Attach Calibration Curves for dp Flowmeters

2) Include mounting elevations for level Instruments

3) All entries within solid box to be typed in prior to start of test

Designed Calibration			Measured Calibration		
Input Signal	Output	Eng. Value	Input	Output	Comments

Notes

Tested by (Print Name) Witnessed by (Print Name)

Signature Signature

Date / / Date / /

RADIO TEST REPORT

TEST FORM (TF15)

RADIO FREQUENCY : _____ RADIO MANUFACTURER : _____
RADIO MODEL # : _____ SERIAL # : _____
LOCATION : _____

PARAMETER	INITIAL VALUE	FINAL VALUE
CHANNEL/HOP PATTERN		
SYSTEM ADDRESS		
OPERATING MODE		
DATA RATE		
BUFFER		
CTS TIMER		
TIME-OUT TIMER		
LOOPBACK CODE		
SOFTWARE REVISION		
HOPPER BOARD REVISION		
FREQUENCY LOCKOUTS		
DC VOLTAGE WHEN TRANSMITTING		
RADIO POWER OUTPUT (WATTS)		
MATCH EFFICIENCIES		
RETURN LOSS		
ANTENNA VSWR (REFLECTED POWER)		
EFFECTIVE ISOTROPIC RADIATED POWER (EIRP)		

NOTES: CHECK OUT ALL COMPONENTS FOR PROPER GROUNDING.

TESTED BY : _____ DATE : ____/____/____
WITNESSED BY: _____

APPENDIX B

DEVICE INDEX

16010 INSTRUMENTATION DEVICE INDEX

P&ID DWG	E DWG	M DWG	Site	TAG	NO.	DESCRIPTION	TYPE	SPECS	MINIMUM NEMA RATING	SIZE	VOLT	SP / RANGE	UNITS	DWG REF DET MOUNTING	NOTES AND ACCESSORIES	16010 TEST FORM
I11	E11	-	Heather Tank	LE	51	Level Element	Sub	Existing	-	-	-	-	-	E3-A	Move to Temp Tank	TF-14
I11	E12	-	Heather Tank	LE	51	Level Element	Sub	16010-2.07	4X	-	24 Vdc	0-23.1	FT	E3-A		TF-14
I21	-	-	Larkspur Tank	FE	71	Flow Element	-	Existing	-	-	-	-	-	-		TF-14
I21	E21	-	Larkspur Tank	LE	51	Level Element	Sub	Existing	-	-	-	-	-	E3-A	Move to Temp Tank	TF-14
I21	E22	-	Larkspur Tank	LE	51	Level Element	Sub	16010-2.07	4X	-	24 Vdc	0-23.1	FT	E3-A		TF-14
I31	-	-	Tank 8	LE	51	Level Element	Sub	Existing	-	-	-	-	-		Keep in Service Until Demo	-
I31	E32	-	Tank 8	LE	51	Level Element	Sub	16010-2.07	4X	-	24 Vdc	0-23.1	FT	E3-A		TF-14
I41	-	-	Tank 4/5	LE	51	Level Element	Sub	Existing	-	-	-	-	-		Keep in Service Until Demo	-
I41	E42	-	Tank 4/5	LE	51	Level Element	Sub	16010-2.07	4X	-	24 Vdc	0-23.1	FT	E3-A		TF-14

END OF SECTION

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APPENDIX A: GEOTECHNICAL REPORTS

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GEOTECHNICAL ENGINEERING STUDY

CALAVERAS COUNTY WATER DISTRICT
EBBETTS PASS REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY, CALIFORNIA

Prepared for
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Calaveras County Water District
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February 12, 2021
Condor Project No. 8438

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GEOTECHNICAL ENGINEERING STUDY
CALAVERAS COUNTY WATER DISTRICT
EBBETTS PASS REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY, CALIFORNIA

1.0 INTRODUCTION

1.1 GENERAL

This report includes the results of our Geotechnical Engineering Study (GES) for the proposed Redwood Tank Replacement Project. Condor Earth (Condor) performed this study at the request of Kevin Williams with Calaveras County Water District (CCWD). This GES is intended to meet the requirements of American Water Works Association (AWWA) D103-09 and the 2019 California Building Code (CBC).

1.2 PROJECT DESCRIPTION

Site plans were not available at the time of this writing. However, we understand that the project consists of replacing four redwood water storage tanks with new steel tanks supported on concrete slabs-on-grade with ringwall foundations. The four tank replacement sites are as follows:

- Heather Tank – Located at the eastern end of Heather Drive in Forest Meadows.
- Meadowmont 13 Tank – Located in the cul-de-sac of Flume Court in Arnold.
- Big Trees 4 and 5 Tanks – Located above Bigfoot Circle in Camp Connell.
- Big Trees 8 Tank – Located approximately 900 feet north of the intersection of Highway 4 and Meko Drive in Camp Connell.

The site locations are presented on the Figure 1 – Vicinity Map, and Figures 2A through 2D – Site Maps with Boring Locations, Appendix A

As each site's topography is generally flat, cuts and fills during earthwork are anticipated to be minimal (2 feet or less) to provide level foundation pads with positive site drainage. Excavations for underground utilities are not anticipated to exceed 10 feet below final site grade.

2.0 PURPOSE AND SCOPE

This GES was performed to 1) characterize geotechnical conditions at the sites; 2) identify geotechnical or geologic conditions that might impact design or construction of the sites; 3) provide geotechnical recommendations to mitigate geologic and geotechnical constraints to the sites; and 4) provide geotechnical design criteria for development of the sites, and design of project foundations and slabs-on-grade.

Condor completed the following work for this GES:

1. Reviewed available geotechnical and seismic data relevant to the sites and their immediate vicinity.
2. Explored, sampled, and classified subsurface soil and rock within each site by means of one exploratory boring at each site.
3. Tested samples collected from the borings to measure their pertinent engineering and index properties. The tests included moisture content and dry density, particle size distribution and corrosion potential. Laboratory test results are presented in Appendix D.

4. Analyzed the findings from the field exploration and laboratory testing to develop geotechnical recommendations for:
    a. General earthwork including site stripping, subgrade preparation, temporary excavations, trench backfill, import fill, compaction criteria, and site surface drainage;
    b. Foundation design and construction, including foundation type, allowable bearing capacities, lateral resistance, settlement, and foundation depth;
    c. 2019 CBC seismic design criteria;
    d. Concrete slabs and exterior flatwork; and
5. Prepared this written report summarizing our findings, conclusions, and geotechnical recommendations.

3.0 SUBSURFACE EXPLORATION METHODS

On November 30, 2020, Condor explored the subsurface conditions by means of one geotechnical boring at each tank site. Borings were advanced to a maximum depth of 24.5 feet below existing ground surface or auger refusal with a truck-mounted CME-55 drill rig using solid-stem auger methods. Each boring was sampled at select depths by with a 3-inch outside diameter California Modified sampler fitted with 2.5-inch outside diameter stainless steel liners or a 2-inch outside diameter Standard Penetration Test (SPT) sampler. Samplers were driven with a 140-pound auto trip hammer falling 30 inches. Blow counts were recorded as the number of hammer blows required to drive the sampler each 6-inch increment of an 18-inch drive. N Values are reported as the number of blows required to drive the sampler the final 12 inches. N Values for the California Modified sampler have been approximately correlated to SPT blow counts by using a factor of 0.67 A Condor geologist visually classified samples and cuttings at the time of drilling using the Unified Soil Classification System and applicable rock classification system. The boring locations are presented in Figures 2A to 2D, Appendix A. Detailed soil boring logs are presented in Appendix C and laboratory test results are presented in Appendix D.

4.0 SITE DESCRIPTIONS

This project consists of four individual tank site locations along the upper Highway 4 corridor between Forest Meadows and Camp Connell. A brief description of each site is provided below.

4.1 HEATHER TANK SITE

The Heather Tank Site is located at the north end of Heather Drive in Forest Meadows at an elevation of approximately 3,700 feet. The new tank will be built in a similar footprint as the existing tank. The site is bound on all sides by residential development. The existing tank pad is cut into native ground with cut slopes to the east, south and west up to approximately 5 feet in height. The ground surface elevation at the boring location is approximately 2 feet higher than the ground surface adjacent to the existing tank.

4.2 MEADOWMONT 13

The Meadowmont 13 Tank Site is in the cul-de-sac of Flume Court in Arnold at an elevation of approximately 4,270 feet. The new tank will be built in a similar footprint as the existing tank. The existing tank is surrounded by a concrete block wall and the site is bound by residential development

4.3 BIG TREES 4 AND 5

The Big Trees 4 and 5 Tank Site is located above Bigfoot Circle in Camp Connell at an elevation of approximately 5,285 feet. A new tank will replace one of two existing wood tanks.

4.4 BIG TREES 8

The Big Trees 8 Tank Site is located approximately 900 feet north of the intersection of Highway 4 and Meko Drive in Camp Connell at an elevation of approximately 5,365 feet. A new tank will be built adjacent to the existing tank. The site is an existing hillside cut pad surrounded by timber land. Approximately 2 feet of artificial fill was encountered in our boring, located in the southern portion of the pad.

5.0 GEOLOGIC AND SEISMIC SETTING

5.1 REGIONAL GEOLOGY

The project is located in the Sierra Nevada geomorphic province. The basement rock of the Sierra Nevada consists of steeply dipping metamorphic rocks of Paleozoic and Mesozoic age that have been intruded by Mesozoic granitic plutons of the Sierra Nevada Batholith. Locally, these basement rocks are overlain by the eroded remnants of younger, Tertiary age, continental volcanic and sedimentary rock, and Quaternary alluvium. Uplift and westward tilting of the Sierra Nevada range began along the faults flanking its eastern margin. Erosion by west-flowing streams incised deep canyons and removed much of the Tertiary rock. Several episodes of glaciation during the last 2 million years have exposed basement rock at high elevations. The geologic processes of tectonic uplift and erosion continue to the present.

5.2 LOCAL GEOLOGY

Based upon the published Geologic Map of the Sacramento Quadrangle, shown on Figure 3 – Geologic Map, the bedrock consists of Mehrten Formation and Mesozoic Granite. During our field exploration, we observed that all the tank sites to be underlain by Mehrten Formation. The Mehrten Formation is characterized by andesitic tuffs and gravels.

5.3 FAULTING AND SEISMICITY

The locations of faults relative to the project are shown on Figure 4 – Regional Fault Map. No known active or potentially active faults cross the sites, and the sites are not located in a Fault-Rupture Hazard Zone as established by the Alquist-Priolo Earthquake Fault Zoning Act (Hart, 1994 and 2007). Therefore, ground rupture from faulting is not considered a significant hazard. The sites are also not in an area currently covered by the Seismic Hazard Mapping Act, which includes landslide and liquefaction hazards. Nonetheless, the sites are susceptible to ground shaking from earthquakes, and the proposed tanks should be designed for seismic conditions accordingly.

6.0 SUBSURFACE CONDITIONS

Condor explored subsurface conditions by means of one boring at each tank site. The borehole locations are shown on Figures 2A through 2D, Appendix A. Additional information regarding the drilling methods and investigation dates is provided in Section 3.0.

6.1 EARTH MATERIALS

The subsurface soils generally consisted sandy siltstone and silty sandstone of the Mehrten Formation which is generally hard and weak. Our boring at the Heather tank site encountered soft clay in the upper 2 feet. However, the ground surface at the boring location is approximately 2 feet higher than the ground surface adjacent to the existing tank. Our boring at the Big Trees 8 tank site encountered 2 feet non-engineered fill consisting of soft clayey sand. This boring is located in the southern portion of the existing pad, opposite of the cut slope. All other sites encountered materials of the Mehrten Formation.

6.2 LOCAL GROUNDWATER AND SURFACE MOISTURE CONDITIONS

Groundwater was not encountered during our field investigation. While fluctuations in the groundwater levels do occur due to change in seasons, variations in rainfall, construction impacts, and other factors, static groundwater is not anticipated to affect the project design or construction due to the depth. Surface moisture content changes can, however, affect soil conditions and construction during earthwork.

7.0 SEISMIC DESIGN PARAMETERS

Probabilistic values of ground motion corresponding to various levels of seismic hazards are available on-line from professional organizations using the USGS data to retrieve the seismic design data and presents the findings in a report format. The USGS uses a probabilistic model to estimate ground motions corresponding to various levels of seismic hazard. Site soils were classified using the procedures specified in the 2019 CBC, which utilizes ASCE 7-16.

The results of the general seismic analysis using the 2019 CBC for Site Class C (very dense soil and soft rock) are summarized below and provided in Appendix B. The recommended values for design of the proposed structures are:

Risk Category :		IV
Site Class:		C
Seismic Coefficient,	S_s:	0.468g
Seismic Coefficient,	S_1:	0.198g
Site Coefficient,	Fa:	1.3
Site Coefficient,	Fv:	1.5
Adjusted Seismic Coefficient ,	S_{MS}:	0.608g
Adjusted Seismic Coefficient ,	S_{M1}:	0.298g
Design Parameter,	S_{DS}:	0.405g
Design Parameter,	S_{D1}:	0.198g

g = acceleration due to gravity

7.1 LIQUIFACTION, SEISMIC SETTLEMENT POTENTIAL

Liquefaction normally occurs when sites underlain by saturated, loose to medium dense, granular soils are subjected to relatively high ground shaking. During an earthquake, ground shaking may cause certain types of soil deposits to lose shear strength resulting in ground settlement, oscillation, loss of bearing capacity, land sliding, and the buoyant rise of buried structures. Most liquefaction hazards are associated with sandy soils, silty soils of low plasticity, and some gravelly soils. Cohesive soils (clays) are generally not considered to be susceptible to liquefaction. In general, liquefaction hazards are most severe within the upper 50 feet of the surface, except where slope faces, or deep foundations are present. The potential for an earthquake with the intensity and duration characteristics capable of promoting liquefaction are present at the site. However, the risk of liquefaction is considered negligible due to the presence of bedrock at the sites. Further evaluation of liquefaction is not recommended.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 GENERAL

Based on our findings, it is our professional opinion that the project should be suitable from a geotechnical standpoint for construction of the proposed water tanks provided the recommendations contained herein

are incorporated into the project design. Given the site conditions encountered, we conclude that perimeter ring wall foundations and slabs on grade supported on engineered fill or competent native soils derived from underlying weathered bedrock should provide adequate support for the anticipated structural loading. At a minimum, overexcavation of the existing site soils should extend to at least 2 feet below final soil subgrade beneath the tank bottoms, and 1 foot below the bottom of the ring wall foundations. This requirement for overexcavation may be waived upon approval of the Geotechnical Engineer at the time of construction. Based on the conditions encountered in our soil borings, we anticipate that overexcavation will be waived at all sites except Big Trees 8 (B-4). The site contains soft undocumented fill that will not be suitable for support. While thickness may vary, the depth of unsuitable soil is 2 feet based on the boring logs.

Specific conclusions and recommendations addressing these geotechnical considerations, as well as general recommendations regarding the geotechnical aspects of design and construction, are presented in the following sections.

8.2 GRADING AND EARTHWORK RECOMMENDATIONS

Grading and site work should be performed in accordance with the 2019 CBC, Chapter 33 (Safeguards During Construction Construction), Appendix J (Grading), and Chapter 18 (Soils and Foundations), and with the recommendations of the Geotechnical Engineer-of-Record during construction. Where the recommendations of this report and the cited sections of the CBC are in conflict, the owner should request clarification from the Geotechnical Engineer-of-Record. The recommendations of this report should not be waived without the consent of the Geotechnical Engineer-of-Record for the project. Recommendations for additional work and construction monitoring are contained in later sections of this report.

8.2.1 Clearing and Grubbing

At the time of our field investigation, the sites were developed with the existing redwood tanks. Areas proposed to receive structural improvements should commence with the removal of any existing improvements and root systems, if present. All roots greater than ½-inch in diameter shall be removed by either mechanical means or by hand during grading. Any organic-laden material free from debris may be stockpiled for later use in non-structural areas where approved by the owner, but such material should not be used for engineered fill.

It is also possible that other buried objects such as foundations and utility lines, etc., may exist, especially in areas of existing improvements. These items should be removed and disposed of offsite where encountered within the construction limits. Underground pipes should be removed within the limits of construction wherever possible or abandoned in-place by plugging with cement grout to prevent migration of soil and/or water. All excavations resulting from removal activities should be cleaned of loose or disturbed material and dish-shaped with sides slope 3H:1V or flatter, to permit access of compaction equipment. These excavations should be backfilled with engineered fill.

8.2.2 Overexcavation

We recommend that all areas required to support the planned tanks should be overexcavated to remove unsuitable soil and replaced with engineered fill in accordance with Section 8.2.5, Engineered Fill Placement. Overexcavation should be performed beneath planned structures and footings. Overexcavation should extend to provide at least one foot of engineered fill below footings and within zones extending 2 feet horizontally from the edges of footings, including the tank ring wall foundation. Additionally, overexcavation should extend to provide at least 2 feet of engineered fill below the interior tank subgrade. Overexcavation may be waived upon approval of the Geotechnical Engineer at the time of construction where competent native soil or weathered bedrock is encountered (Section 8.1 for additional discussion).

Additional overexcavation may be required depending on conditions observed by the Geotechnical Engineer-of-Record in the field during construction. The depth and extent of required overexcavations should be approved in the field by the Geotechnical Engineer-of-Record or qualified representative prior to placement of fill or improvements.

8.2.3 Subgrade Preparation

Subgrade preparation may be waived for the tank construction where overexcavation requirements described in 8.2.2 are achieved and the Geotechnical Engineer-of-Record has approved the subgrade prior to placement of engineered fill. In all other areas, the exposed subgrade should be scarified to a depth of 8 inches, uniformly moisture conditioned, and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density. Native subgrade soils should be uniformly moisture conditioned to between 2 and 4 percentage points above the optimum moisture content. Field density tests should be taken to verify compaction of the prepared subgrade in these areas.

8.2.4 Engineered Fill Materials

Engineered fill used for the project should be either 1) select import engineered fill, or 2) general on-site soils with less than 3 percent organic content.

Select import engineered fill should be inorganic, have an R-value of at least 30, a liquid limit less than 30, and a plastic index less than 7. In addition, select import engineered fill should meet the following particle-size gradation:

Sieve Opening	Percent Passing, by Dry Weight
4-inch square	100
3/4-inch square	70 minimum
U.S. No. 4	60 minimum
U.S. No. 200	50 maximum

Select import engineered fill material that does not meet the above criteria should be tested under the direction of the Geotechnical Engineer-of-Record to determine if it has engineering properties equivalent to, or better than, the existing site materials. Samples of any proposed imported fill material should be submitted to the Laboratory of Record for testing and approved by the Geotechnical Engineer-of-Record prior to being brought to the site.

General on-site engineered fill should be inorganic, contain no rocks greater than 4-inches in least dimension, and be free of deleterious materials. Soils containing more than 3 percent by weight of organic material should be considered organic. Our subsurface data and laboratory test data indicates that the near-surface native soil encountered in the borings generally meets the criteria for import engineered fill.

The existing native soils may include lean clay and may have a moisture content at the time of grading that is not conducive to compaction. The contractor may want to consider import materials that are more suited to obtaining optimum moisture content for compaction during cool or wet seasons.

8.2.5 Engineered Fill Placement

Engineered fill should be placed in a series of horizontal layers not exceeding 8 inches in loose thickness, uniformly moisture-conditioned, and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density. Fill soils composed of sands, silty sands, and non-plastic silts

should be uniformly moisture conditioned to between 1 and 3 percentage points above the optimum moisture content. Additional fill lifts should not be placed if the previous lift did not meet the required relative compaction or if soil conditions are not stable. Discing and/or blending may be required to uniformly moisture-condition soils used for engineered fill.

8.2.6 Excavations

Onsite materials can be easily to moderately difficult to excavate with conventional earthmoving equipment. Cuts in the Mehrten Sandstone will likely become more difficult with depth. We anticipate that temporary excavations less than 5 feet deep may be cut as steep as 1½H:1V (horizontal to vertical). Deeper cuts should be considered on a case-by-case basis. All open cuts should be in compliance with applicable Occupational Safety Health Administration (OSHA) regulations (California Construction Safety Orders, Title 8) and should be monitored for evidence of incipient instability.

8.3 UNDERGROUND UTILITY TRENCHES

Unless concrete bedding is required around utilities, pipe bedding should consist of sand with a sand equivalent of at least 30 or the pipe manufacturer's requirements, whichever is more restrictive. The pipe bedding should extend from 6 inches below the invert of the pipe to 1 foot above the pipe crown of the pipe. The pipe bedding material should be compacted to a minimum of 90 percent relative compaction or the manufacturer's recommendations if more stringent.

Trench backfill above the pipe bedding zone should be placed in the same manner as required in Section 8.2.5, Engineered Fill Placement. On-site fill soils and "non-organic" native soils may be used as backfill in trenches above the pipe bedding. Utility trench backfill should be placed in layers not exceeding a loose lift thickness of 8 inches, uniformly moisture conditioned, and compacted to a minimum of 90 percent relative compaction.

Compaction criteria for trench backfill above the bedding zone may be decreased to 85 percent relative compaction in landscape areas at least 5 feet beyond structural improvements, except in areas overlain by pavements, sidewalks, or other hardscapes. In landscape areas overlain by pavements, sidewalks, or other hardscapes, we recommend that the trench backfill be compacted to a minimum of 90 percent relative compaction.

8.4 SURFACE DRAINAGE CONTROL

Surface drainage should be planned to prevent ponding and to enable water to drain away from foundations, slabs and edges of pavements toward suitable collection or discharge facilities. A positive surface drainage of at least 5 percent should be provided within 10 feet of all foundations. Elsewhere, positive surface drainage of at least 2 percent is recommended to allow for rapid removal of surface water. A detailed drainage plan is outside the scope of this report but should be included in the preparation of the grading plans for the project.

9.0 FOUNDATION RECOMMENDATIONS

9.1 GENERAL FOUNDATION RECOMMENDATIONS

Foundation improvements should be designed and constructed in accordance with the 2019 CBC, Title 24, Chapter 17 (Structural Tests and Special Inspections), Chapter 18 (Soil and Foundations), and all other sections applicable to the proposed structural improvements.

9.2 FOOTINGS

Footings for all structures should be embedded at least 24 inches below the lowest adjacent grade when founded on engineered fill or weathered bedrock prepared in accordance with Section 8.2. Condor defines lowest jacent grade as the tank bottom, the bottom of an adjacent pavement, or exterior soil subgrades, whichever results in a deeper footing. Footing thickness and widths should meet the minimum requirements in the 2019 CBC and AWWA Standard D100-05.

Footings bearing on compacted engineered fill or weathered bedrock or engineered fill should be designed using a maximum net allowable bearing capacity of 3,000 pounds per square foot (psf) for dead plus normal duration live loads. This allowable bearing capacity may be increased by one-third for total load conditions, including wind and seismic. This allowable value includes a factor of safety of 2.0.

Base friction resistance may be calculated using an ultimate friction coefficient of 0.30 for concrete on fill or native soil. For the steel tank bottom, a friction coefficient of 0.25 should be used. Passive resistance may be calculated using an allowable equivalent fluid unit weight of 350 bounds per cubic foot (pcf). The recommended passive resistance is reduced by a factor of about 1.5 from the ultimate value to reduce deflections to tolerable amounts. The recommended passive pressure and friction coefficients may be combined, without reduction, for calculating total lateral resistance. The passive resistance contributed by soils within 1 foot of the ground surface should be neglected unless these soils are protected and confined by a slab-on-grade or pavement. Gaps between the footing and adjacent ground should be completely backfilled using engineered fill, concrete or lean cement slurry with a 28-day unconfined compressive strength of at least 100 pounds per square inch (psi).

Settlement of the ringwall foundation is estimated to be 1-inch and ¾-inch for total and differential settlement, respectively. The settlement of the center of the tank relative to the ringwall foundation is estimated to be less than 1-inch.

10.0 SLABS-ON-GRADE

10.1 SUBGRADE SUPPORT FOR SLABS-ON-GRADE

Concrete slabs should be supported on ground prepared in accordance with Section 8.2, including minimum overexcavation depths discussed in the section.

10.2 GUIDELINES FOR CONCRETE SLABS-ON-GRADE

We understand that concrete slabs for buildings may not be included for the proposed project. As such, the following sections may not be applicable.

Condor does not consider itself an expert on the control of slab cracking or prevention of vapor transmission through concrete slabs. The following recommendations are provided based on current practice in the industry. The designer of record should provide final details on plans based on their past experience, coupled with our recommendations.

Where dampness of floor slabs is to be minimized, the slabs should be constructed on a minimum 4-inch thick layer of capillary break material covered with a high quality vapor retarder. The capillary break material should be free-draining, clean gravel or rock such as No. 4 by ¾-inch pea gravel or permeable aggregate complying with Caltrans Standard Specifications, Section 68, Class 1, Type B.

The vapor retarder should have a minimum thickness of 15 mils, a permeance as tested before and after mandatory conditioning (ASTM E 1745, Section 7.1.2 – 7.1.5) of less than 0.01 perms [grains/(ft^2 · hr ·

inHg)], and comply with the ASTM E 1745 Class A requirements. Vapor retarders having these properties are commonly referred to as "vapor barriers". The designer of the slab-on-grade of record may omit the blotter at their discretion when a concrete with a water-cement ratio of 0.45 or less is specified. The vapor retarder should be constructed in accordance with ASTM E 1643 using material which meets ASTM E 1745.

Slabs should be cast using concrete with a maximum slump of 4 inches or less. Excessive water content is the major cause of concrete cracking. To reduce concrete shrinkage, a water reducing agent or plasticizer may be utilized in the concrete to increase slump while maintaining an appropriate water/cement ratio. Hot reinforcing steel should be cooled prior to concrete placement to help prevent concrete shrinkage at the bar location. Where there is potential for moisture accumulation under the slab, special consideration should be given to allow gravity drainage of any water that could migrate into the subgrade of the slab or rock cushion.

The final design floor slab thickness and reinforcement should be provided by the project Structural Engineer.

Exterior concrete slabs (i.e., sidewalks, concrete aprons, etc.,) should be constructed over a minimum of 4 inches of compacted aggregate base on subgrade prepared as discussed in Section 8.2. All exterior slabs should be reinforced or jointed and scored to limit cracking from shrinkage.

11.0 CORROSION POTENTIAL

Chemical tests were performed on one discrete sample of the near-surface soils at each tank site. Test results are summarized in the following table:

	Tank Site			
	Heather Drive	**Meadowmont 13**	**Big Trees 4/5**	**Big Trees 8**
Redox (mV)	410	350	380	420
pH	6.30	6.16	6.72	6.44
Resistivity (ohm/cm)	76,000	13,000	3,900	1,400
Chloride (mg/kg)	None detected	None detected	None detected	None detected
Sulfate (mg/kg)	Non detected	None detected	19	None detected

Resistivity tests performed on the same discrete soil samples indicated that the soils range from negligibly corrosive to corrosive to buried metal. A commonly accepted correlation between soil resistivity and corrosivity towards ferrous metals is provided in the following table developed by the National Association of Corrosion Engineers (NACE):

Soil Resistivity	Corrosivity
Less than 500 ohm-cm	Very corrosive
500 to 1,000 ohm-cm	Corrosive
1,000 to 2,000 ohm-cm	Moderately corrosive
2,000 to 10,000 ohm-cm	Mildly corrosive
Over 10,000 ohm-cm	Progressively less corrosive

Appendix D contains the results of the corrosivity tests performed, as well as a brief evaluation letter by our laboratory subcontractor. The brief evaluation provides general recommendations regarding protecting buried metals. If warranted, a corrosion expert should be consulted to develop specific recommendations.

12.0 ADDITIONAL SERVICES

The geotechnical recommendations and design criteria given in this report are sensitive to the location, design details, and any special requirements of the new construction. Condor should review the geotechnical elements of project grading, foundation plans and specifications prior to construction bidding to check that the intent of our recommendations has been incorporated into these project documents. If Condor does not review the geotechnical elements of the plans and specifications, the reviewing Geotechnical Engineer should thoroughly review this report and concur with its conclusions and recommendations or provide alternative recommendations.

Because surface conditions may vary across the sites, geotechnical recommendations used as a basis for construction contracting are sensitive to the possible need for adjustment in the field. The adjustments are dependent upon conditions revealed during construction that could previously only be assumed based upon site exploration. Since the intent of the recommendations given in this report are best understood by a Condor representative, we recommend that field observations and testing during earthwork and construction be performed by Condor. If Condor does not provide the field observations and testing, the Geotechnical Engineer-of-Record should thoroughly review this report and concur with its conclusions and recommendations or provide alternative recommendations.

The Geotechnical Engineer or qualified representative should be on-site to observe and advise during site preparation, grading and earthwork, and construction of foundations and slabs-on-grade. These observations should be supplemented with periodic density and compaction testing of subgrade and engineered fills to evaluate conformance with the recommendations contained in this report. It is important that foundation excavations be checked after cleaning and immediately prior to concrete placement to verify their suitability.

13.0 LIMITATIONS

The conclusions and recommendations presented in this report are intended for planning, design, and construction of the proposed school sites as described in this report. These conclusions and recommendations may be invalid if:

- The report is used for other sites or project components;
- The encountered soil or groundwater conditions are different than those anticipated in this report;
- The recommendations contained in this report are not followed;
- Any other change is implemented that materially alters the project; or
- State agency review and acceptance of the report is not obtained.

This report was prepared in accordance with the generally accepted standards of environmental and geotechnical engineering practice existing in California at the time it was written. No other warranty, express or implied, is made. It is the owner's responsibility to see that all parties to the project, including the designer, contractors, subcontractors, etc., are made aware of this report in its entirety.

The analyses and recommendations submitted herein are based upon the data obtained from subsurface exploration and materials testing. Subsurface exploration of any site is necessarily confined to selected locations and conditions may, and often do, vary between and around these locations. Should varied conditions come to light during construction on the project, additional exploration, testing, or analysis may be required. Any person concerned with this project who observes conditions or features of the sites or their surrounding

areas that are different from those described in this report, should report them immediately to Condor for evaluation.

It should be noted that changes in the standards of practice in the field of environmental and geotechnical engineering, changes in site conditions, new agency regulations, or modifications to the proposed project are grounds for this report to be professionally reviewed. In light of this, there is a practical limit to the usefulness of this report without critical professional review. It is suggested that two years be considered a reasonable time for the usefulness of this report.

We trust this report provides the information required at this time. Please call with any questions.

Respectfully submitted,

CONDOR EARTH

Ronald L. Skaggs, GE No. 2295
Vice President, Engineering Services

Chad Borean
Staff Geologist

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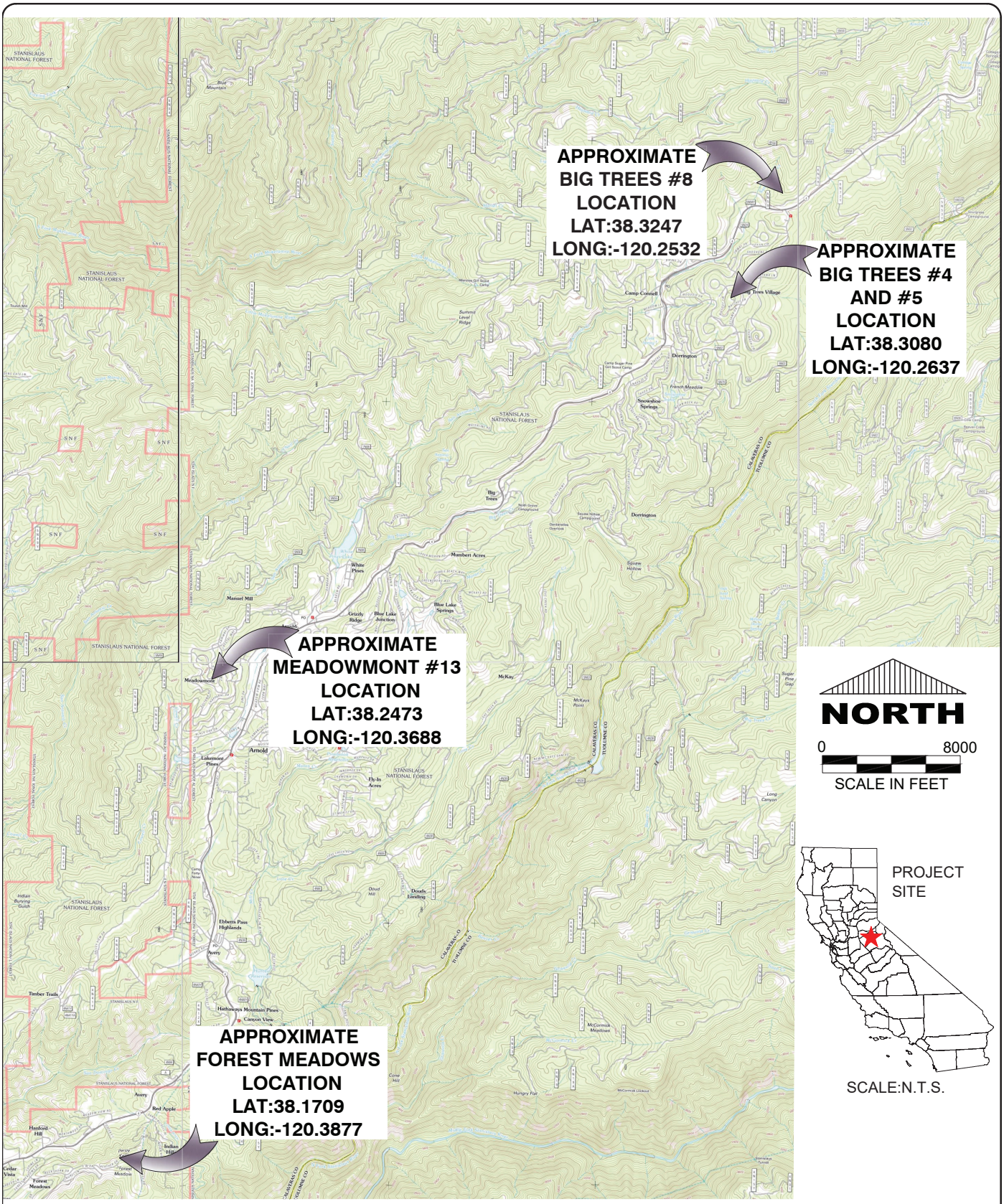
14.0 REFERENCES

California Building Code, 2019, California Building Standards Commission, and International Conference of Building Officials, 2012.

APPENDIX A
Figures



BACKGROUND IMAGE: USGS 7.5 MINUTE QUADRANGLE, BOARD CROSSING, DORRINGTON, FORT MTN., MURPHYS AND STANISLAUS 2012

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Job No.	8438
Date	23 DEC 2020
Scale	AS SHOWN
Drawn	KGM
Chk'd	CB

VICINITY MAP
CALAVERAS COUNTY WATER DISTRICT
REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY, CALIFORNIA

FIGURE
1

8438_F1

X:\Project\8000_prj\8438 CCWD Redwood Tank Replacement\8438_CAD\DWG\8438_F1.dwg 12-23-20 11:54:11 AM kmckinley

LEGEND

B-1 ⌖ = APPROXIMATE BORING LOCATION

BACKGROUND IMAGE: GOOGLE EARTH 6/25/2018

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SITE MAP WITH BORING LOCATIONS
HEATHER DRIVE, FOREST MEADOWS
REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY WATER DISTRICT
CALAVERAS COUNTY, CALIFORNIA

FIGURE 2A

8438_F2A

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LEGEND

B-2 ⌖ = APPROXIMATE BORING LOCATION

BACKGROUND IMAGE: GOOGLE EARTH 6/25/2018

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SITE MAP WITH BORING LOCATIONS
MEADOWMONT 13
REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY WATER DISTRICT
CALAVERAS COUNTY, CALIFORNIA

FIGURE
2B

8438_F2B

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LEGEND

B-3 ⌖ = APPROXIMATE BORING LOCATION

BACKGROUND IMAGE: GOOGLE EARTH 6/25/2018

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SITE MAP WITH BORING LOCATIONS
BIG TREES 4 AND 5
REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY WATER DISTRICT
CALAVERAS COUNTY, CALIFORNIA

FIGURE
2C

8438_F2C

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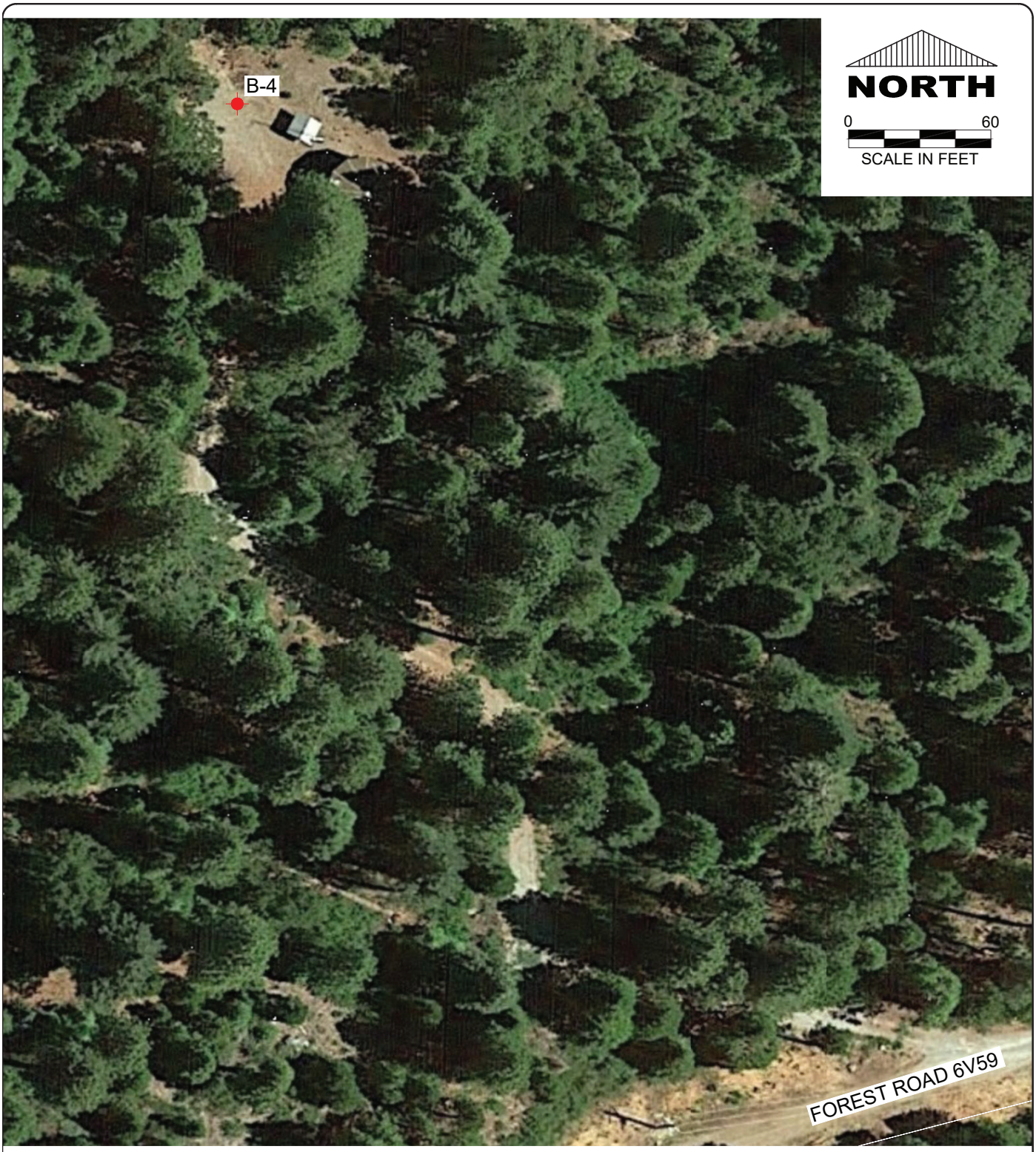

LEGEND

B-3 = APPROXIMATE BORING LOCATION

BACKGROUND IMAGE: GOOGLE EARTH 6/25/2018

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Chk'd	CB

SITE MAP WITH BORING LOCATIONS
BIG TREES 8
REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY WATER DISTRICT
CALAVERAS COUNTY, CALIFORNIA

FIGURE
2D

8438_F2D

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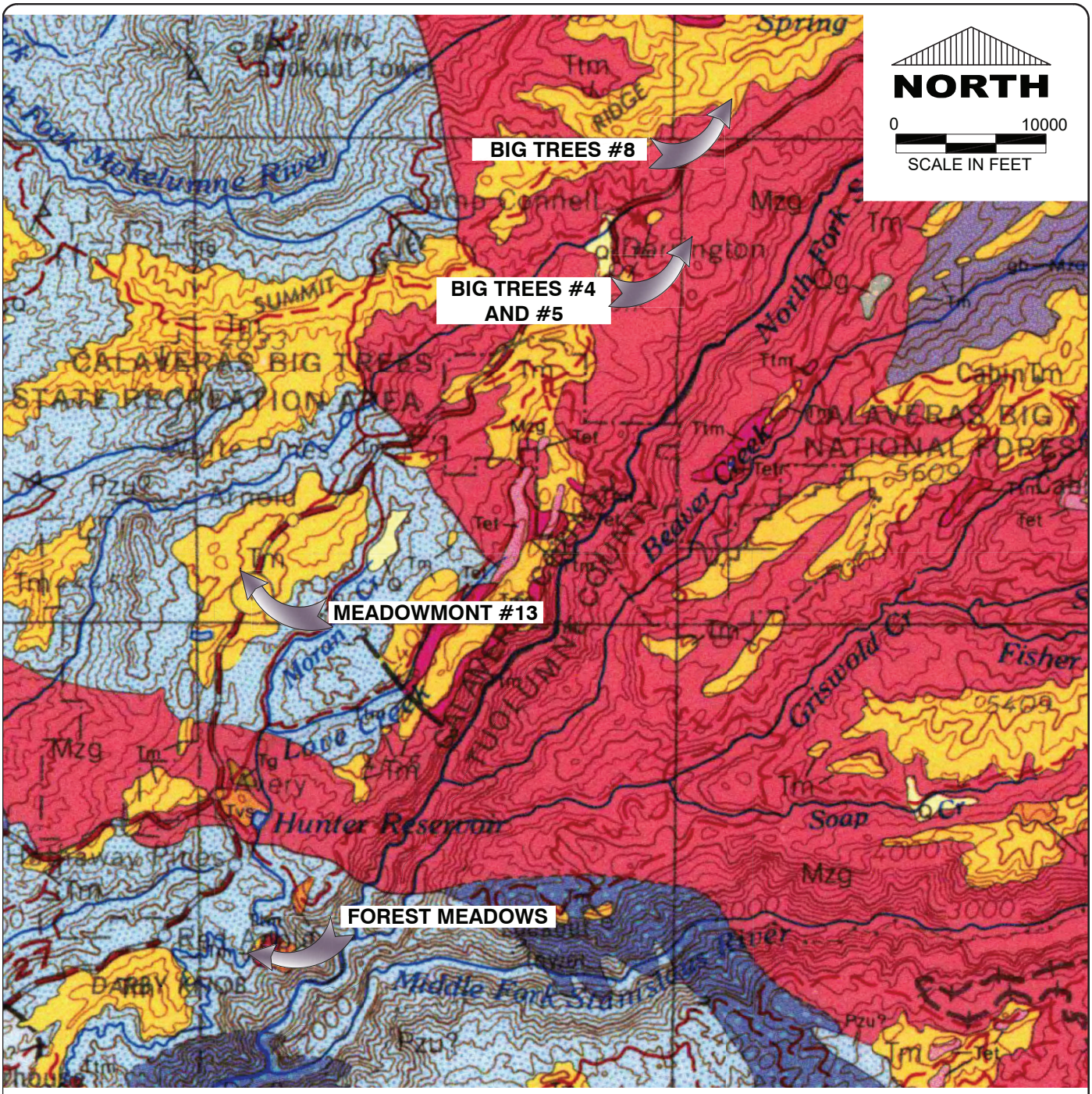

LEGEND

Tm	Mehrten Formation *(Andesitic conglomerate, sandstone, and breccia)*
Pzu?	Undifferentiated Paleozoic(?) rocks
Mzg	Mesozoic granitic rocks

GEOLOGIC MAP OF SACRAMENTO QUADRANGLE, CALIFORNIA D.L. WAGNER 1981

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Chk'd	CB

GEOLOGIC MAP
CALAVERAS COUNTY WATER DISTRICT
REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY, CALIFORNIA

FIGURE
3

8438_F3

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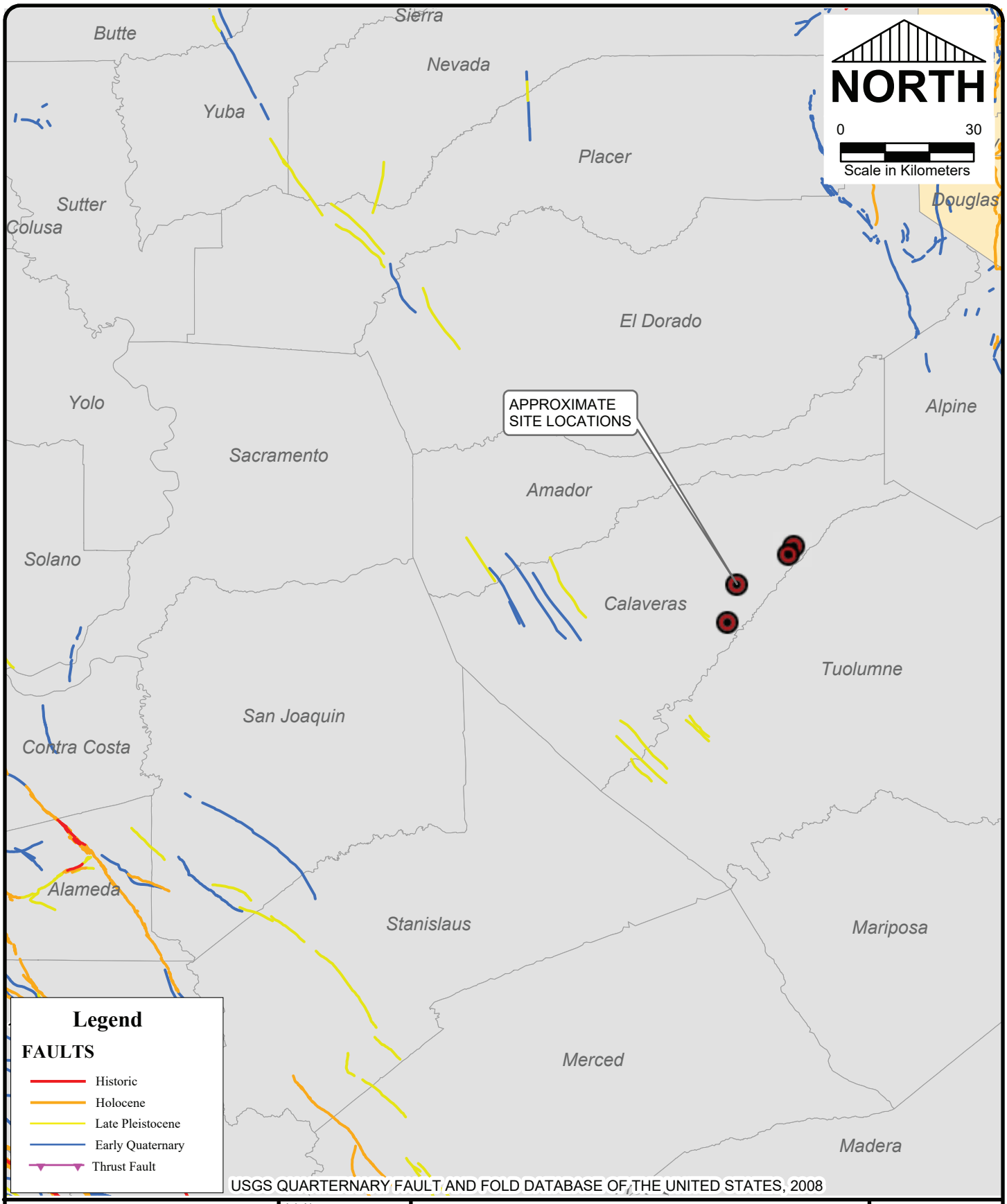

USGS QUARTERNARY FAULT AND FOLD DATABASE OF THE UNITED STATES, 2008

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Job No.	Date	Scale	Drawn	Chk'd
8438	23 Dec 2020	AS SHOWN	KGM	CB

REGIONAL FAULT MAP
CALAVERAS COUNTY WATER DISTRICT
REDWOOD TANK REPLACEMENT PROJECT
CALAVERAS COUNTY, CALIFORNIA

FIGURE 4

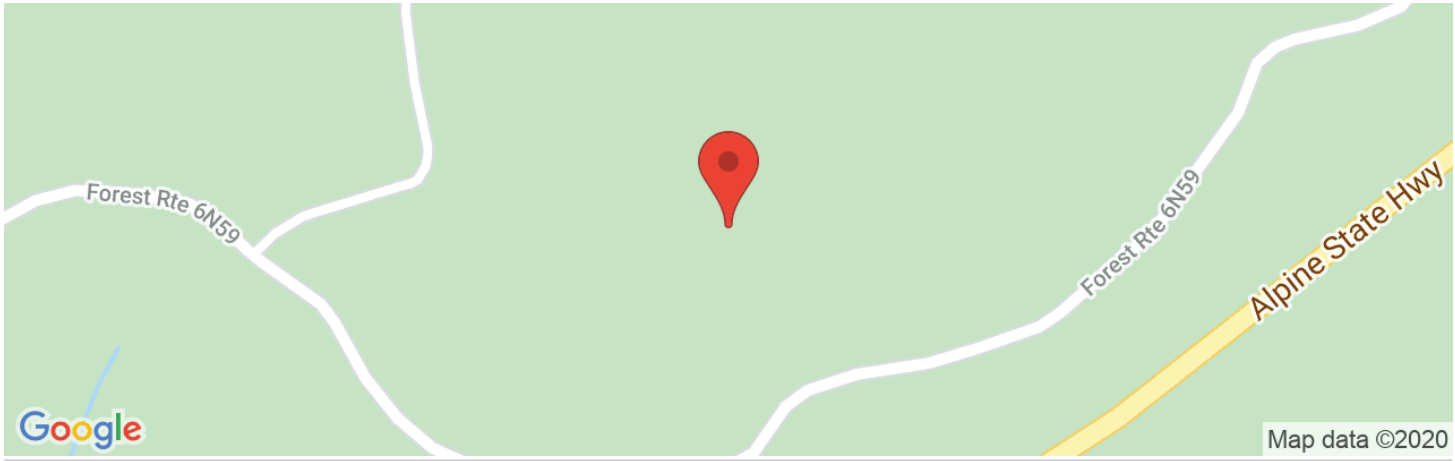
8438 CCWD Redwood Tank Replacement

X:\GIS\8000_PRJ\8438 CCWD Redwood Tank Replacement\8438 CCWD Redwood Tank Replacement.aprx

APPENDIX B
OSHPD U.S. Seismic Design Maps

CCWD Redwood Tank Replacement Project

Latitude, Longitude: 38.324679, -120.253212



Date	12/29/2020, 8:19:55 AM
Design Code Reference Document	ASCE7-16
Risk Category	IV
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	0.468	MCE_R ground motion. (for 0.2 second period)
S_1	0.198	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.608	Site-modified spectral acceleration value
S_{M1}	0.298	Site-modified spectral acceleration value
S_{DS}	0.405	Numeric seismic design value at 0.2 second SA
S_{D1}	0.198	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.3	Site amplification factor at 0.2 second
F_v	1.5	Site amplification factor at 1.0 second
PGA	0.199	MCE_G peak ground acceleration
F_{PGA}	1.201	Site amplification factor at PGA
PGA_M	0.239	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
SsRT	0.468	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.5	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.198	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.208	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.936	Mapped value of the risk coefficient at short periods
C_{R1}	0.953	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

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APPENDIX C
Logs of Borings

CONDOR EARTH TECHNOLOGIES, INC.
209-234-0518
FAX 209-234-0538

LOG OF BORING No. B-1

PROJECT: CCWD Redwood Tank Replacment Project **PROJECT NO.:** 8438
CLIENT: Calaveras County Water District
PROJECT LOCATION: Four (4) Sites within Calaveras County
LOCATION: Heather Drive, Forest Meadows **ELEVATION:** 3707 ft.
DRILLER: V & W Drilling **LOGGED BY:** C. Borean
DRILLING METHOD: Solid-Stem Auger **DATE:** 11/30/20
DEPTH TO - WATER> INITIAL: - **AFTER DRILLING:** - **CAVING>** -

Depth (feet)	Sample Type	USCS	Description	Graphic	Sample No.	Blow Counts	N Value	Moisture Content (%)	Dry Density (pcf)	Plasticity Index	Liquid Limit	% < #200	Misc. Tests
0		CL	Sandy clay, firm, dark red, moist										
		Rx											
			2.0										
			Mehrten formation: Tuffaceous sandstone, moderately weathered, weak, low hardness, damp, light gray		1, 2	3 9 8	8	29.8	85.5			65.4	
5					3	7 10 11	21						
					4, 5	9 17 20	20	22.7	77.7			46.5	
10			Light reddish brown		6	4 4 4	8						
15					7, 8	7 7 7	9						
20					9	4 7 9	16						
					10	6 8 8	16						
25			Boring Terminated at 24.5 ft.										
30													
35													

Ground surface at Boring 2' above ground surface at existing tank.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

CONDOR EARTH TECHNOLOGIES, INC.
209-234-0518
FAX 209-234-0538

LOG OF BORING No. B-2

PROJECT: CCWD Redwood Tank Replacment Project **PROJECT NO.:** 8438
CLIENT: Calaveras County Water District
PROJECT LOCATION: Four (4) Sites within Calaveras County
LOCATION: Meadowmont 13, Arnold **ELEVATION:** 8438 ft.
DRILLER: V & W Drilling **LOGGED BY:** C. Borean
DRILLING METHOD: Solid-Stem Auger **DATE:** 11/30/20
DEPTH TO - WATER> INITIAL: - **AFTER DRILLING:** - **CAVING>** -

Depth (feet)	Sample Type	USCS	Description	Graphic	Sample No.	Blow Counts	N Value	Moisture Content (%)	Dry Density (pcf)	Plasticity Index	Liquid Limit	% < #200	Misc. Tests
0		Rx	Mehrten Formation: Tuffaceous sandstone with gravel, moderately weathered, weak, low hardness, damp		1, 2	30 30 50/3	>50	15.6	107.0			22.7	
5					3	50/5	>50						
					4	50/6	>50						
10			Boring Terminated at 9 ft.										
15													
20													
25													
30													
35													

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

CONDOR EARTH TECHNOLOGIES, INC.
209-234-0518
FAX 209-234-0538

LOG OF BORING No. B-3

PROJECT: CCWD Redwood Tank Replacment Project **PROJECT NO.:** 8438
CLIENT: Calaveras County Water District
PROJECT LOCATION: Four (4) Sites within Calaveras County
LOCATION: Big Trees 4 & 5, Camp Connell **ELEVATION:** 8438 ft.
DRILLER: V & W Drilling **LOGGED BY:** C. Borean
DRILLING METHOD: Solid-Stem Auger **DATE:** 11/30/20
DEPTH TO - WATER> INITIAL: - **AFTER DRILLING:** - **CAVING>** -

Depth (feet)	Sample Type	USCS	Description	Graphic	Sample No.	Blow Counts	N Value	Moisture Content (%)	Dry Density (pcf)	Plasticity Index	Liquid Limit	% < #200	Misc. Tests
0		Rx	Mehrten Formation: Tuffaceous sandstone, moderately weathered, weak, low hardness, damp		1	38 50/4	>50	16.8	86.5			19.9	
5					2	38 50/5	>50						
			No recovery			50/3	>50						
10					3	25 50/5	>50						
15			Boring Terminated at 14 ft.										
20													
25													
30													
35													

CONDOR EARTH TECHNOLOGIES, INC.
209-234-0518
FAX 209-234-0538

LOG OF BORING No. B-4

PROJECT: CCWD Redwood Tank Replacment Project **PROJECT NO.:** 8438
CLIENT: Calaveras County Water District
PROJECT LOCATION: Four (4) Sites within Calaveras County
LOCATION: Big Trees 8, Camp Connell **ELEVATION:** 5367 ft.
DRILLER: V & W Drilling **LOGGED BY:** C. Borean
DRILLING METHOD: Solid-Stem Auger **DATE:** 11/30/20
DEPTH TO - WATER> INITIAL: - **AFTER DRILLING:** - **CAVING>** -

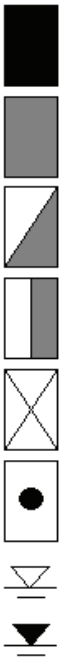
Depth (feet)	Sample Type	USCS	Description	Graphic	Sample No.	Blow Counts	N Value	Moisture Content (%)	Dry Density (pcf)	Plasticity Index	Liquid Limit	% < #200	Misc. Tests
0		SC	Artificial fill - Undocumented Clayey sand, soft, moist, dark brown										
		Rx	2.0 Mehrten Formation: Tuffaceous sandstone, moderately weathered, weak, low hardness, damp		1	27 50/5	>50	21.0	88.7			57.9	
5					2	29 50/5	>50						
					3, 4	38 50/5	>50	19.3	88.7				
10					5	50/6	>50						
15			No recovery			50/4							
20					6	24 50/3	50						
			Boring Terminated at 21 ft.										
25													
30													
35													

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

UNIFIED SOIL CLASSIFICATION SYSTEM			
Division		**Group Symbol**	**Group Name**
Coarse-Grained Soils (more than 50 percent retained or the No. 200 sieve)	**Gravel** (% gravel > % sand)	**GW**	Well-graded Gravel (with Sand)
		GW-GM	Well-graded Gravel with Silt (and Sand)
		GW-GC	Well-graded Gravel with Clay (and Sand)
		GP	Poorly graded Gravel (with Sand)
		GP-GM	Poorly graded Gravel with Silt (and Sand)
		GP-GC	Poorly graded Gravel with Clay (and Sand)
		GM	Silty Gravel (with Sand)
		GC	Clayey Gravel (with Sand)
	Sand (% sand ≥ % gravel)	**SW**	Well-graded Sand (with Gravel)
		SW-SM	Well-graded Sand with Silt (and Gravel)
		SW-SC	Well-graded Sand with Clay (and Gravel)
		SP	Poorly graded Sand (with Gravel)
		SP-SM	Poorly graded Sand with Silt (and Gravel)
		SP-SC	Poorly graded Sand with Clay (and Gravel)
		SM	Silty Sand (with Gravel)
		SC	Clayey Sand (with Gravel)
Fine-Grained Soils (50 percent or more passing the No. 200 sieve)	**Silt or Clay** LL < 50	**ML**	Silt (with Sand or Gravel), Sandy Silt (with Gravel), Gravelly Silt (with Sand)
		CL-ML	Silty Clay (with Sand or Gravel), Sandy Silty Clay (with Gravel), Gravelly Silty Clay (with Sand)
		CL	Lean Clay (with Sand or Gravel), Sandy lean Clay (with Gravel), Gravelly lean Clay (with Sand)
		OL	Organic Clay (with Sand or Gravel), Sandy organic Clay (with Gravel), Gravelly organic Clay (with Sand), organic Silt (with Sand or Gravel), Sandy organic Silt (with Gravel), Gravelly organic Silt (with Sand)
	Silt or Clay LL ≥ 50	**MH**	Elastic Silt (with Sand or Gravel), Sandy elastic Silt (with Gravel), Gravelly elastic Silt (with Sand)
		CH	Fat Clay (with Sand or Gravel), Sandy fat Clay (with Gravel), Gravelly fat Clay (with Sand)
		OH	Organic Clay (with Sand or Gravel), Sandy organic Clay (with Gravel), Gravelly organic Clay (with Sand), organic Silt (with Sand or Gravel), Sandy organic Silt (with Gravel), Gravelly organic Silt (with Sand)
Highly Organic Soils		**PT**	Peat and other highly organic soils

Note: Percentages are by dry weight. Soil classifications based on some criteria that are not shown. Group Name items in parentheses may or may not apply, depending on percent of sand or gravel.

Coarse Grained Soil Definitions	
Fraction	**Particle Dimension or U.S. Standard Sieve Size/No.**
Boulders	Above 12"
Cobbles	12" to 3"
Gravel - coarse - fine	 3" to 3/4" 3/4" to No. 4
Sand - coarse - medium - fine	 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200



Split-barrel, 3-inch O.D., 2.43-inch I.D.

Split-barrel, 2.5-inch O.D., 1.93-inch I.D.

Standard Penetration Test (SPT), 2.0-inch O.D., 1.375-inch I.D.

Shelby Tube

Disturbed sample

No recovery

Groundwater level during drilling

Subsequent groundwater level

Note: O.D. = outside diameter I.D. = inside diameter

CONDOR EARTH TECHNOLOGIES, INC.

LOG LEGEND AND SOIL CLASSIFICATION

WEATHERING

Severely Weathered – minerals decomposed to soil, but rock fabric and structure are preserved.
Highly Weathered – abundant fractures coated with oxides, carbonates, sulphates, mud, etc., thorough discoloration, rock disintegration, mineral decomposition.
Moderately Weathered – some fracture coating, moderate or localized discoloration, little to no effect on cementation, slight mineral decomposition.
Slightly Weathered – a few stained fractures, slight discoloration, little or no effect on cementation, no mineral decomposition.
Fresh – unaffected by weathering agents; no appreciable change with depth.

FRACTURE, JOINT, OR SHEAR SPACING

(Spacing in Inches)	
Very little fractured	Greater than 48
Occasionally fractured	12 to 48
Moderately fractured	6 to 12
Closely fractured	1.25 to 6
Intensely fractured	0.5 to 1.25
Crushed	Less than 0.5

THICKNESS OF SEDIMENTARY ROCK BEDS

(Thickness in Inches)	
Very thickly bedded	Greater than 72
Thickly bedded	24 to 72
Medium bedded	8 to 24
Thinly bedded	2.5 to 8
Very thinly bedded	0.75 to 2.5
Laminated	0.25 to 0.75
Thinly laminated	Less than 0.25

FRACTURE OR LAYER SEPARATION

(Thickness of Separations in Millimeters)	
Very tight	< 0.1 mm
Tight	0.1 – 0.5 mm
Moderately open	0.5 – 2.5 mm
Open	2.5 – 10 mm
Very wide	> 10 mm

FRACTURE OR LAYER ROUGHNESS

Very Rough - Non-continuous, Hard joint rock wall
Slightly Rough - Hard joint rock wall
Slightly Rough and Soft - Soft joint rock wall
Slickensided - Open and continuous with gouge
Soft Gouge - Open and continuous with soft gouge

STRUCTURE

Intact/Massive – intact rock specimens with few widely spaced discontinuities.
Blocky – well interlocked, undisturbed rock mass, consisting of cubical blocks formed by three intersecting joint sets.
Very blocky – interlocked, partially disturbed, with multi-faceted angular blocks formed by 4 or more joint sets.
Disturbed/Seamy – folded with angular blocks, formed by many intersecting joint sets, persistence of bedding planes or schistosity.
Disintegrated – poorly interlocked, heavily broken, mix of angular and rounded rock pieces.
Laminated/Sheared – lack of blockiness due to close spacing of shear planes.

STRENGTH

Plastic or very low strength.
Friable – crumbles easily by rubbing with fingers.
Weak – an unfractured specimen of such material will crumble under light hammer blows.
Moderately strong – specimen will withstand a few heavy hammer blows before breaking.
Strong – specimen will withstand a few heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.
Very strong – specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.

HARDNESS

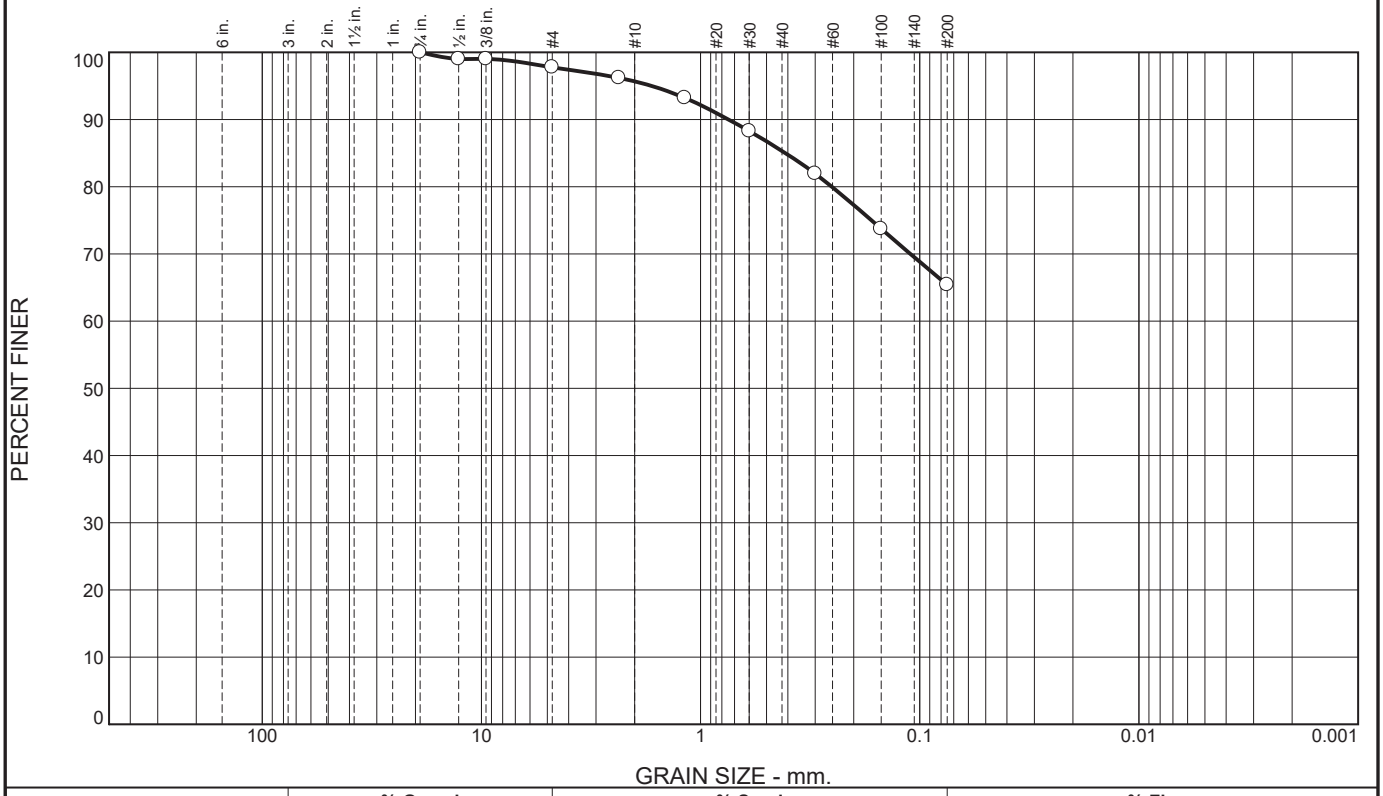
Soft – reserved for plastic material alone.
Low hardness – can be gouged deeply or carved easily with a knife blade.
Moderately hard – can be readily scratched by a knife blade; scratch leaves a heavy trace of dust and is readily visibly after the powder has been blown away.
Hard – can be scratched with difficulty; scratch produced a little powder and is often faintly visible.
Very hard – cannot be scratched with knife blade; leaves a metallic streak.

GROUND WATER

Dry
Damp
Wet
Dripping
Flowing

APPENDIX D
Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.2	2.1	10.4	19.9	65.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.0		
3/8"	99.0		
#4	97.8		
#8	96.2		
#16	93.2		
#30	88.3		
#50	81.9		
#100	73.7		
#200	65.4		

* (no specification provided)

Material Description

Red Brown Silty Clay with Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.7450 D_{85}= 0.4101 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=0.70

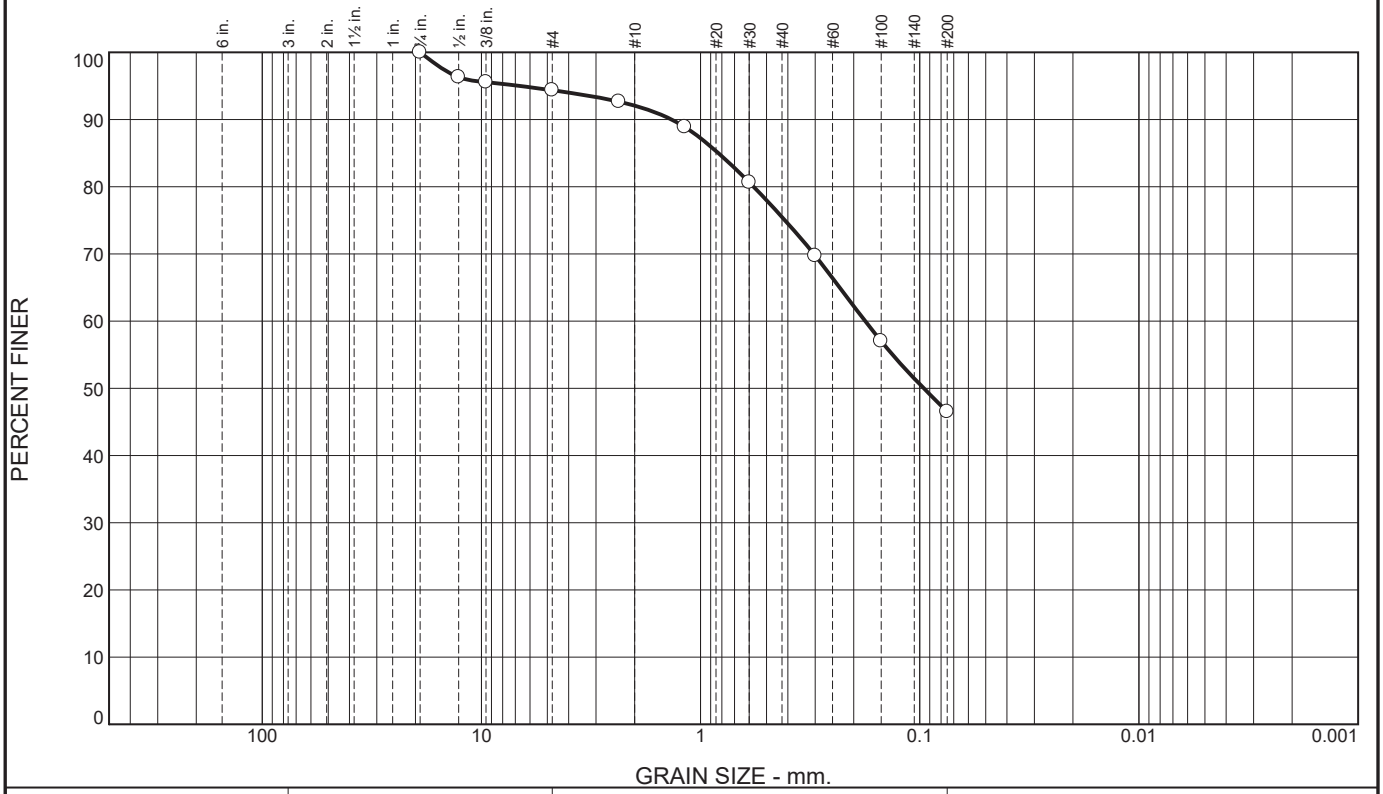
Location: B1-2
Sample Number: SA-1 **Depth:** 3.5'-4.0' **Date:** 12/9/2020

CONDOR EARTH TECHNOLOGIES, INC.
Stockton, California

Client: Calaveras County Water District
Project: Redwood Tank Replacement Project
Project No: 8438 **Figure**

Tested By: E. Carrasco **Checked By:** R. Skaggs

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.7	2.2	16.6	29.0	46.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	96.3		
3/8"	95.5		
#4	94.3		
#8	92.6		
#16	88.9		
#30	80.6		
#50	69.7		
#100	57.0		
#200	46.5		

* (no specification provided)

Material Description

Olive Light Brown Silty Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.3597 D_{85}= 0.8281 D_{60}= 0.1775
D_{50}= 0.0958 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=1.21

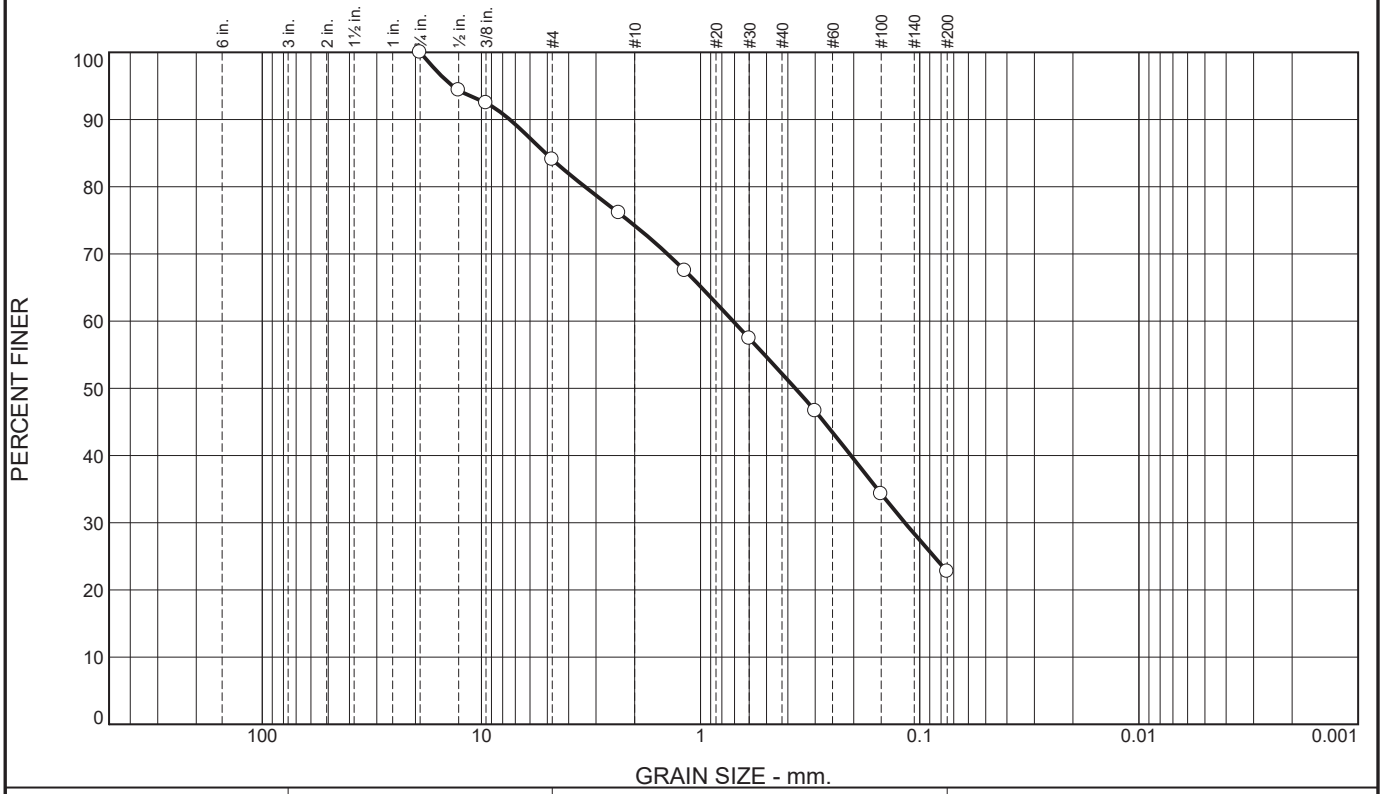
Location: B1-5
Sample Number: SA-2 **Depth:** 8.5'-9.0' **Date:** 12/15/2020

CONDOR EARTH TECHNOLOGIES, INC.
Stockton, California

Client: Calaveras County Water District
Project: Redwood Tank Replacement Project
Project No: 8438 **Figure**

Tested By: E. Carrasco **Checked By:** R. Skaggs

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	15.9	9.9	22.0	29.5	22.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	94.4		
3/8"	92.5		
#4	84.1		
#8	76.1		
#16	67.5		
#30	57.4		
#50	46.6		
#100	34.3		
#200	22.7		

* (no specification provided)

Material Description

Brown Silty Sand with Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 7.4306 D_{85}= 5.1005 D_{60}= 0.7110
D_{50}= 0.3695 D_{30}= 0.1168 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=2.42

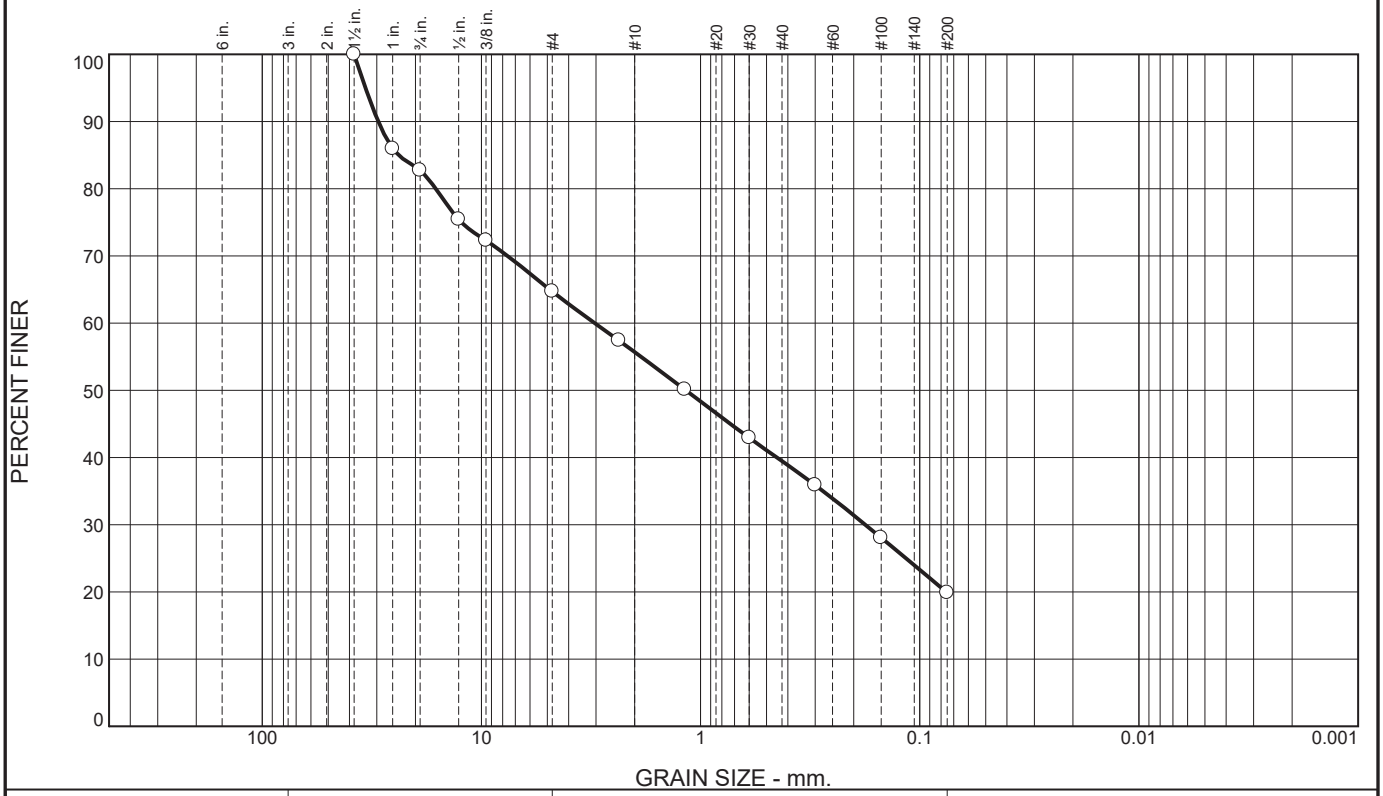
Location: B2-2
Sample Number: SA-3 **Depth:** 3.5'-4.0' **Date:** 12/16/2020

CONDOR EARTH TECHNOLOGIES, INC.
Stockton, California

Client: Calaveras County Water District
Project: Redwood Tank Replacement Project
Project No: 8438 **Figure**

Tested By: E. Carrasco **Checked By:** R. Skaggs

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.3	18.0	9.0	16.2	19.6	19.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2"	100.0		
1"	86.0		
3/4"	82.7		
1/2"	75.4		
3/8"	72.3		
#4	64.7		
#8	57.4		
#16	50.1		
#30	42.9		
#50	35.9		
#100	28.1		
#200	19.9		

* (no specification provided)

Material Description

Brown Silty Sand With Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 29.5602 D_{85}= 23.9230 D_{60}= 3.0428
D_{50}= 1.1680 D_{30}= 0.1771 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=3.66

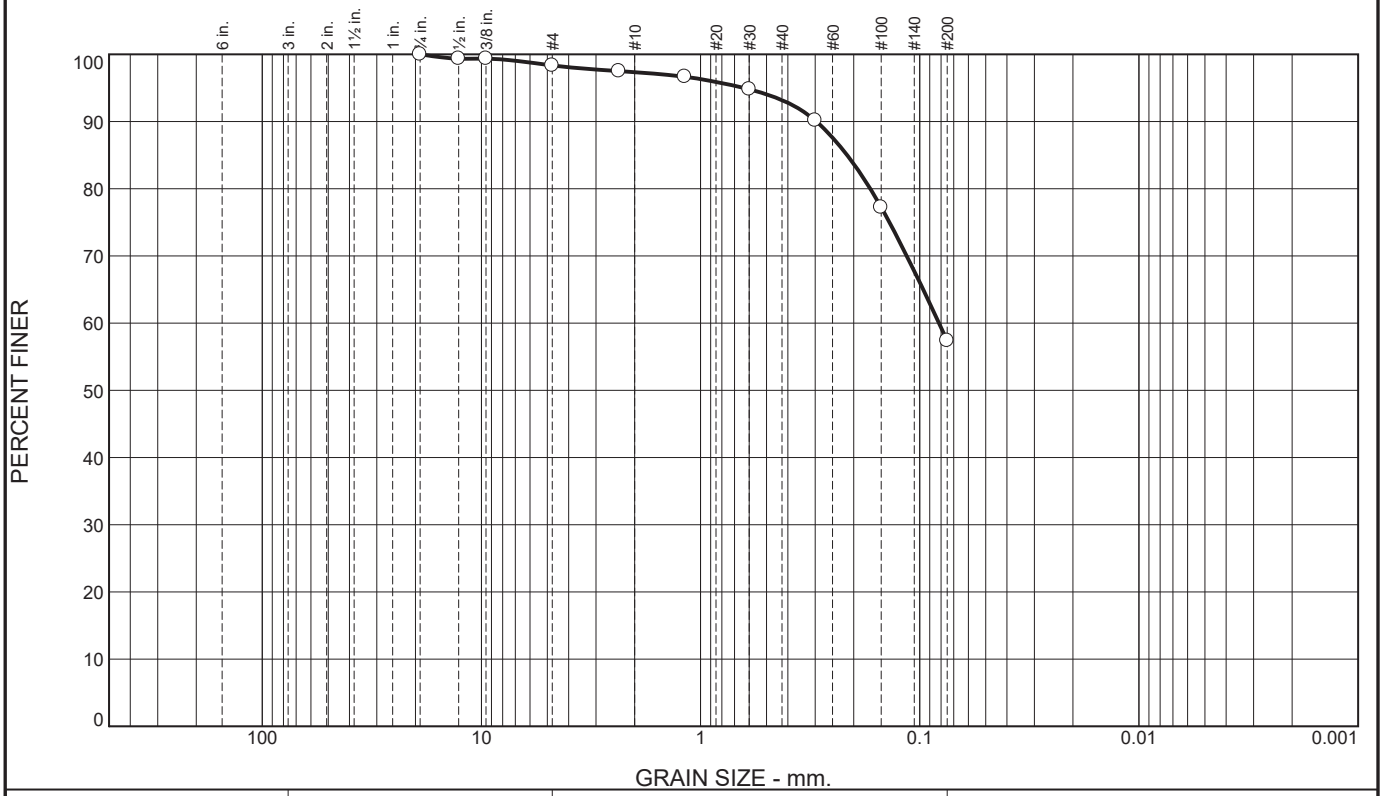
Location: B3-1
Sample Number: SA-4 **Depth:** 2.5'-3.0' **Date:** 12/9/2020

CONDOR EARTH TECHNOLOGIES, INC.
Stockton, California

Client: Calaveras County Water District
Project: Redwood Tank Replacement Project
Project No: 8438 **Figure**

Tested By: E. Carrasco **Checked By:** R. Skaggs

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	1.0	4.1	35.8	57.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.3		
3/8"	99.3		
#4	98.3		
#8	97.5		
#16	96.7		
#30	94.8		
#50	90.2		
#100	77.2		
#200	57.4		

* (no specification provided)

Material Description

Brown Sandy Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.2963 D_{85}= 0.2143 D_{60}= 0.0817
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=0.46

Location: B4-1
Sample Number: SA-5 **Depth:** 3.0'-3.5' **Date:** 12/9/2020

CONDOR EARTH TECHNOLOGIES, INC.
Stockton, California

Client: Calaveras County Water District
Project: Redwood Tank Replacement Project
Project No: 8438 **Figure**

Tested By: E. Carrasco **Checked By:** R. Skaggs

CONDOR EARTH
188 Frank West Circle, Suite I
Stockton CA 95206
Phone 209.234.0518
FAX 209.234.0538
www.condorearth.com

Project #: 8438
Client: Calaveras County Water District
Project: Redwood Tank Replacement Project
Test Date: 12/9/2020
Tested by: E. Carrasco

Natural Dry Density/Unit Weight								
Sample #	B1-2	B1-5	B2-2	B3-1	B4-1	B4-4		
Date	12/9/20	12/9/20	12/9/20	12/9/20	12/9/20	12/9/20		
Depth (ft)	3.5'-4.0'	8.5'-9.0'	3.5'-4.0'	2.5'-3.0'	3.0'-3.5'	8.0'-8.5'		
Sleeve Diam. (in)	2.45	2.45	2.45	2.45	2.45	2.45		
Sleeve Area (sq in)	4.7	4.7	4.7	4.7	4.7	4.7		
Sample Length (in)	6.0	6.0	5.9	6.0	6.0	5.9		
Volume (cu.in)	28.2	28.2	27.7	28.2	28.2	27.7		
Volume(cu ft)	0.016	0.016	0.016	0.016	0.016	0.016		
Gross wt (grms)	1141.6	1022.1	1221.0	1062.5	1113.8	1096.6		
Tare wt (grms)	319.9	316.8	320.8	315.1	318.9	326.1		
Soil wt (grms)	821.7	705.3	900.2	747.4	794.9	770.5		
Soil wt (lbs)	1.8	1.6	2.0	1.6	1.8	1.7		
Wet density (pcf)	111.0	95.3	123.7	101.0	107.4	105.9		
Dry Density(pcf)	85.5	77.7	107.0	86.5	88.7	88.7		

Notes:

Moisture Content								
Tare #	H	C	J	A	E	I		
Wet wt & Tare (grms)	1141.6	1022.1	1221.0	1062.5	1113.8	1096.6		
Dry wt & Tare (grms)	953.1	891.7	1099.8	955.1	975.8	972.0		
Wt of Water (grms)	188.5	130.4	121.2	107.4	138.0	124.6		
Wt of Tare (grms)	319.9	316.8	320.8	315.1	318.9	326.1		
Wt dry Soil (grms)	633.2	574.9	779.0	640.0	656.9	645.9		
Moisture Content %	29.8	22.7	15.6	16.8	21.0	19.3		

California State Certified Laboratory No. 2153

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

17 December, 2020

Job No. 2012072
Cust. No.12257

Mr. Eric Carrasco
Condor Earth Technologies, Inc.
188 Frank West Circle, Suite I
Stockton, CA 95206

Subject: Project No.: 8438
Project Name: Calaveras County H2O District, Redwood Tank Replacement
Corrosivity Analysis – ASTM Test Methods

Dear Mr. Carrasco:

Pursuant to your request, CERCO Analytical has analyzed the soil samples submitted on December 9, 2020. Based on the analytical results, this brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurements: Sample No.004 is "Corrosive"; Sample No.003 is "Moderately Corrosive"; Sample No.002 is "Mildly Corrosive"; and Sample No.001 is "Negligibly Corrosive". All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentrations were none detected with a reporting limit of 15 mg/kg.

The sulfate ion concentration ranges from none detected to 19 mg/kg and are determined to be insufficient to damage reinforced concrete structures and cement mortar-coated steel at these locations.

The pH of the soils ranged from 6.16 to 6.72 which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

The redox potentials range from 350 to 420-mV. Sample No.002 and Sample No.003 is indicative of potentially "slightly corrosive" soils resulting from anaerobic soil conditions, and Sample No.001 and Sample No.004 is indicative of aerobic soil conditions.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific design recommendations or consultation, please call *JDH Corrosion Consultants, Inc. at (925) 927-6630.*

We appreciate the opportunity of working with you on this project. If you have any questions, or if you require further information, please do not hesitate to contact us.

Very truly yours,
CERCO ANALYTICAL, INC.

J. Darby Howard, Jr., P.E.
President

JDH/jdl
Enclosure

California State Certified Laboratory No. 2153

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 **462 2771** Fax. 925 **462 2775**
www.cercoanalytical.com

Client: Condor Earth Technologies, Inc.
Client's Project No.: 8438
Client's Project Name: Calaveras County H2O, Redwood Tank Replacement
Date Samples 30-Nov-20
Date Received: 9-Dec-20
Matrix: Soil
Authorization: Signed Chain of Custody

Date of Report: 17-Dec-2020

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Conductivity (umhos/cm)*	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
2012072-001	B1-3	410	6.30	-	76,000	-	N.D.	N.D.
2012072-002	B2-1	350	6.16	-	13,000	-	N.D.	N.D.
2012072-003	B3-2	380	6.72	-	3,900	-	N.D.	19
2012072-004	B4-2	420	6.44	-	1,400	-	N.D.	N.D.

Method:	ASTM D1498	ASTM D4972	ASTM D1125M	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	10	-	50	15	15
Date Analyzed:	15-Dec-2020	15-Dec-2020	-	14-Dec-2020	-	15-Dec-2020	15-Dec-2020

Cheryl McMillen
Laboratory Director

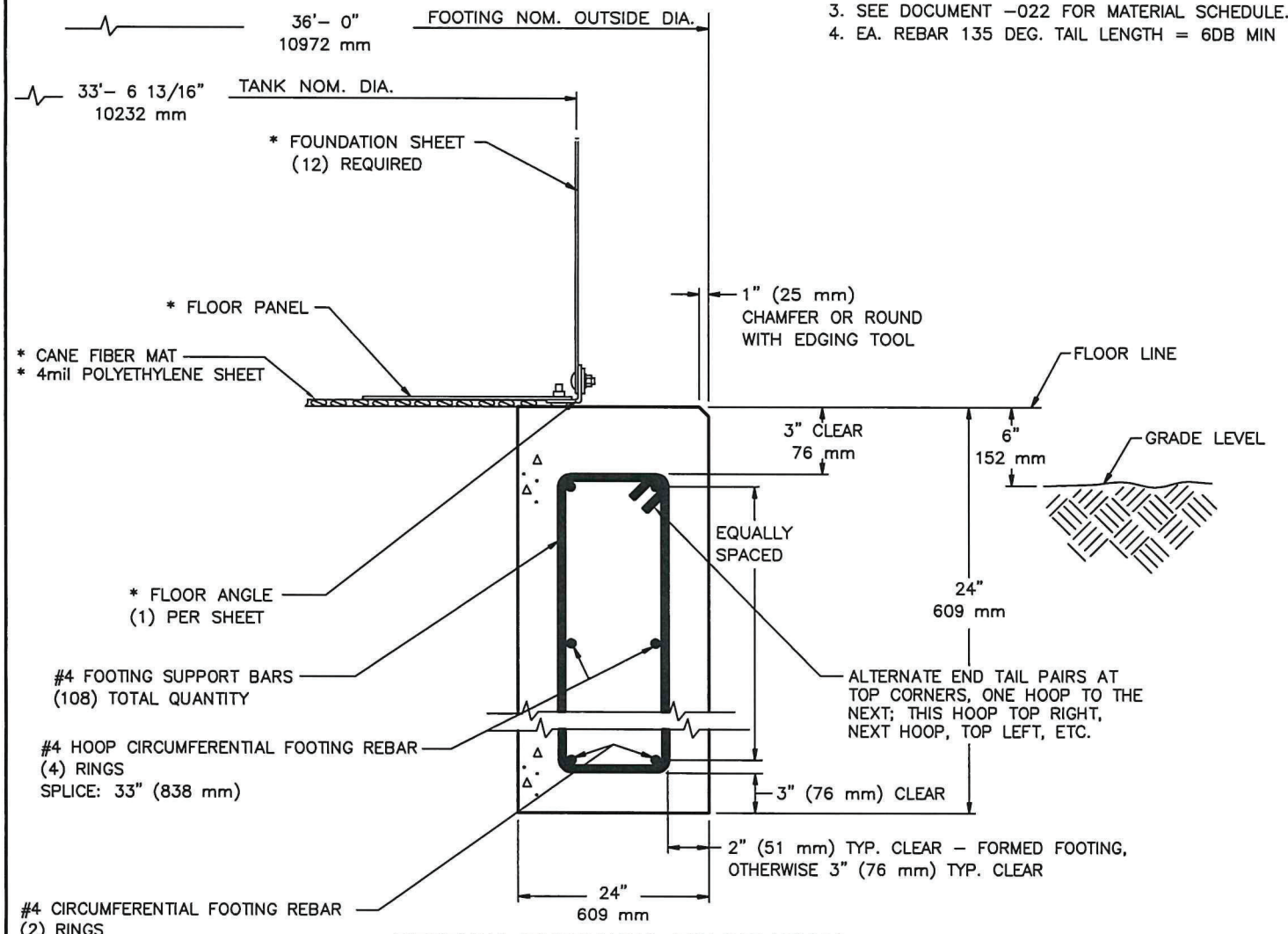
* Results Reported on "As Received" Basis
N.D. - None Detected

Quality Control Summary - All laboratory quality control parameters were found to be within established limits

APPENDIX B: TANK DESIGN

DISCLAIMER:
UNLESS A SOILS OR GEOTECHNICAL REPORT HAS BEEN FURNISHED TO CST, THE FOUNDATION DESIGN IS BASED ON ASSUMED SOIL DESIGN PARAMETERS THAT MAY NOT REFLECT ACTUAL CONDITIONS. THE FOUNDATION DESIGN IS PRELIMINARY ONLY. DO NOT USE FOR CONSTRUCTION UNTIL SOIL DESIGN PARAMETERS ARE VERIFIED BY A SOILS ANALYSIS REPORT. CST ASSUMES NO LIABILITY AND DISCLAIMS LIABILITY FOR THE FOUNDATION DESIGN.

NOTES:
1. THIS DRAWING IS NOT TO SCALE.
2. ITEMS INDICATED * TO BE SUPPLIED BY THE TANK MANUFACTURER. SEE * CST STORAGE PARTS SPECIFICATIONS CHART ON THIS DRAWING.
3. SEE DOCUMENT –022 FOR MATERIAL SCHEDULE.
4. EA. REBAR 135 DEG. TAIL LENGTH = 6DB MIN



SECTION THROUGH FOUNDATION

REL	DESCRIPTION
1	REL PER MIP 2121726 05/11/21

* CST STORAGE PARTS SPECIFICATIONS		
FLOOR ANGLES	IN.	3 X 3 X 1/4
	mm	76 X 76 X 6

CST STORAGE

DEKALB, ILLINOIS 60115

FILE: 21217268

DRAWN BY KN
DATE 05/11/21

34' STEEL FLOOR FND.

CALAVERAS COUNTY, CA
BIG TREE TANK 8

CAMP CONNELL, CALIFORNIA

DRWG NO. 2121726–002

Big Trees #8

DISCLAIMER:
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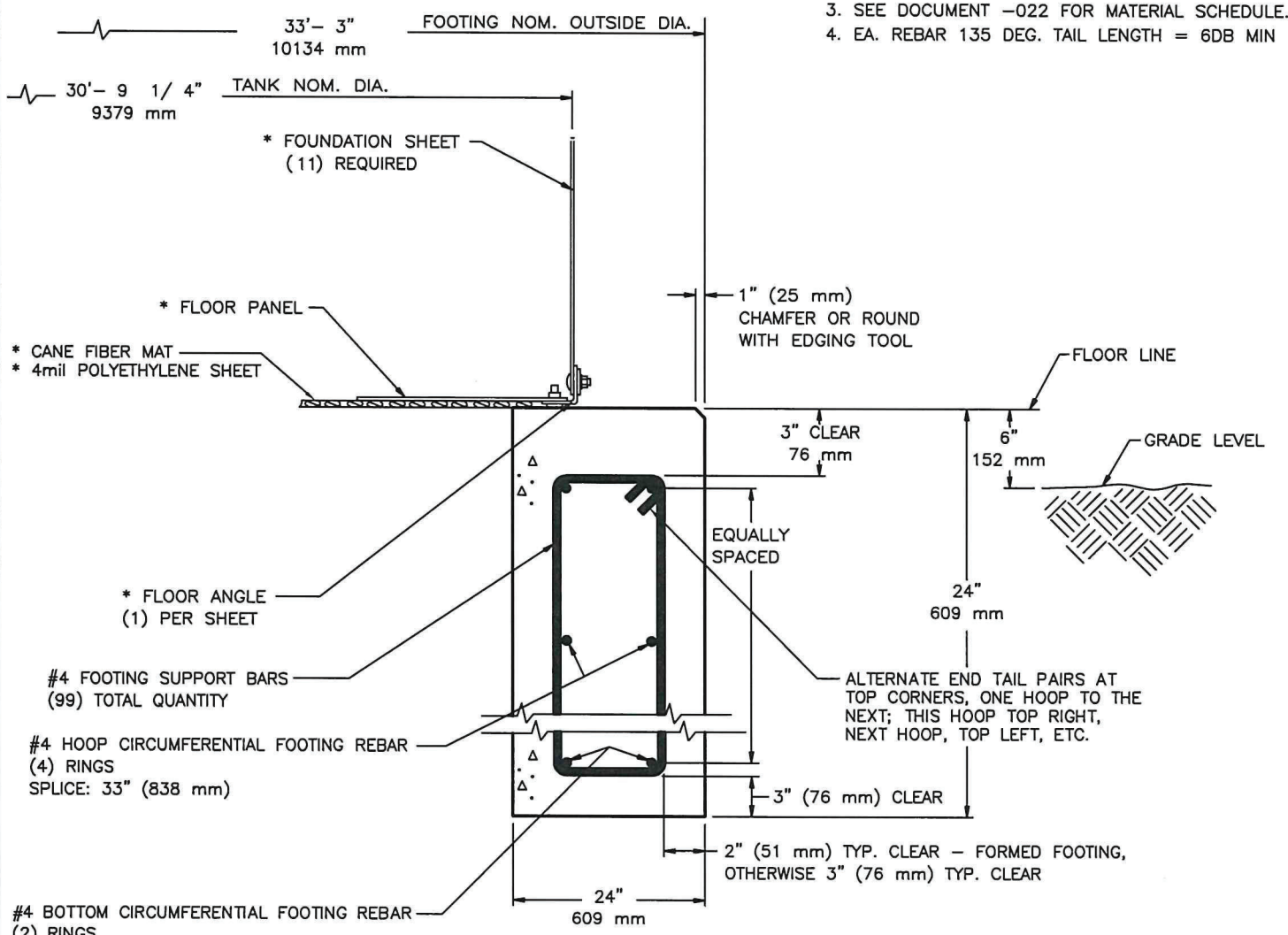
3. SEE DOCUMENT –022 FOR MATERIAL SCHEDULE.
4. EA. REBAR 135 DEG. TAIL LENGTH = 6DB MIN



SECTION THROUGH FOUNDATION

REL	DESCRIPTION
1	REL PER MIP 2121724 05/12/21

* CST STORAGE PARTS SPECIFICATIONS		
FLOOR ANGLES	IN.	3 X 3 X 1/4
	mm	76 X 76 X 6

CST STORAGE

DEKALB, ILLINOIS 60115

FILE: 2121724B

DRAWN BY KN
DATE 05/12/21

31' STEEL FLOOR FND.

CALAVERAS COUNTY, CA – ARNOLD

ARNOLD, CALIFORNIA

DRWG NO. 2121724–002

Arnold 13

DISCLAIMER:
UNLESS A SOILS OR GEOTECHNICAL REPORT HAS BEEN FURNISHED TO CST, THE FOUNDATION DESIGN IS BASED ON ASSUMED SOIL DESIGN PARAMETERS THAT MAY NOT REFLECT ACTUAL CONDITIONS. THE FOUNDATION DESIGN IS PRELIMINARY ONLY. DO NOT USE FOR CONSTRUCTION UNTIL SOIL DESIGN PARAMETERS ARE VERIFIED BY A SOILS ANALYSIS REPORT. CST ASSUMES NO LIABILITY AND DISCLAIMS LIABILITY FOR THE FOUNDATION DESIGN.

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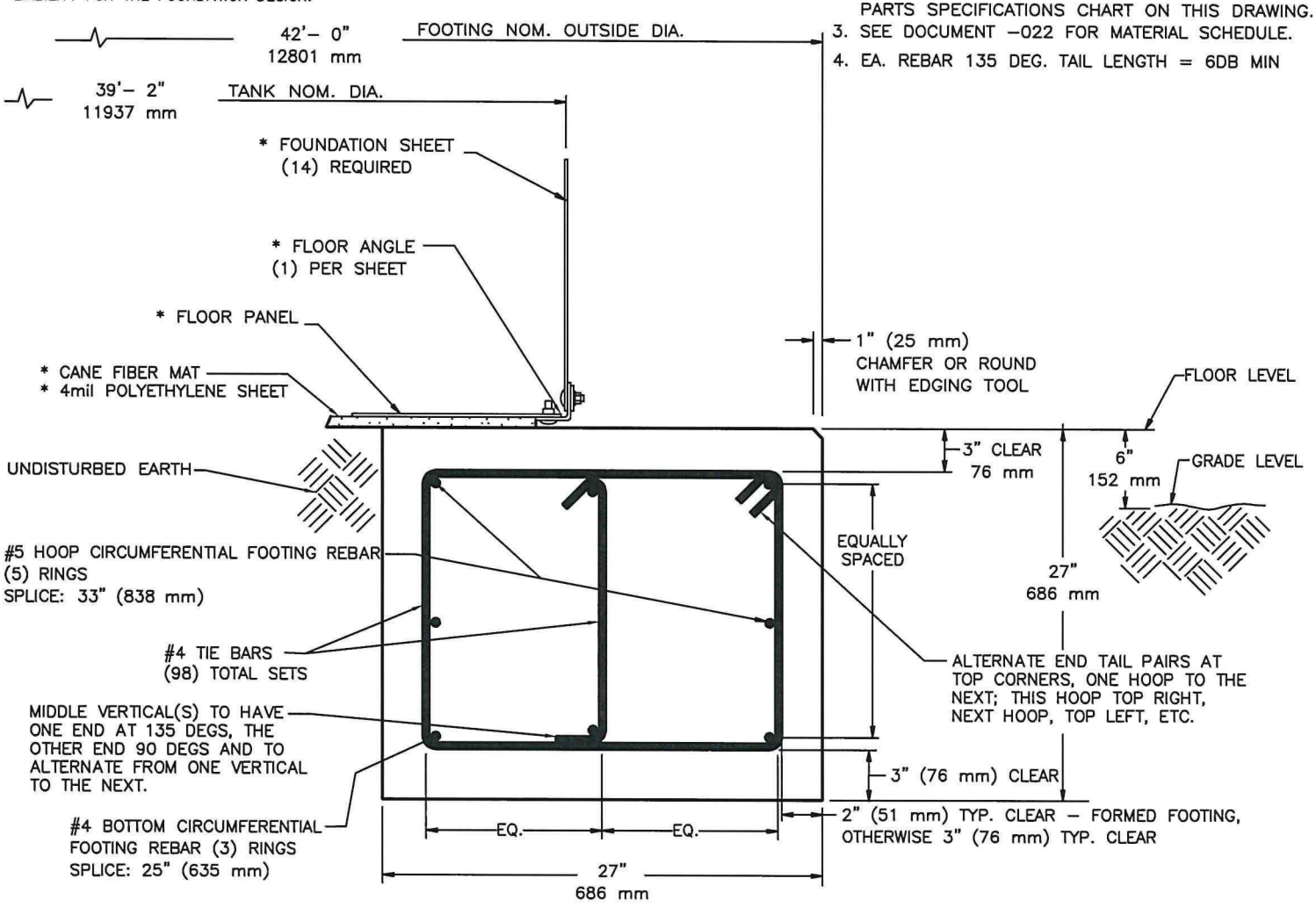
3. SEE DOCUMENT –022 FOR MATERIAL SCHEDULE.
4. EA. REBAR 135 DEG. TAIL LENGTH = 6DB MIN



SECTION THROUGH FOUNDATION

REL	DESCRIPTION
1	REL PER MIP 2121722 05/11/21

* CST STORAGE PARTS SPECIFICATIONS		
FLOOR ANGLES	IN.	3 X 3 X 1/4
	mm	76 X 76 X 6

CST STORAGE

DEKALB, ILLINOIS 60115

FILE: 2121722B'

DRAWN BY kKN
DATE 05/11/21

39' STEEL FLOOR FND.
CALAVERAS COUNTY, CA
– BIG TREE TANK 4

CAMP
CONNELL/DORRINGTON,
CALIFORNIA

DRWG NO. 2121722–002

Big Trees #4

DISCLAIMER:
UNLESS A SOILS OR GEOTECHNICAL REPORT HAS BEEN FURNISHED TO CST, THE FOUNDATION DESIGN IS BASED ON ASSUMED SOIL DESIGN PARAMETERS THAT MAY NOT REFLECT ACTUAL CONDITIONS. THE FOUNDATION DESIGN IS PRELIMINARY ONLY. DO NOT USE FOR CONSTRUCTION UNTIL SOIL DESIGN PARAMETERS ARE VERIFIED BY A SOILS ANALYSIS REPORT. CST ASSUMES NO LIABILITY AND DISCLAIMS LIABILITY FOR THE FOUNDATION DESIGN.

NOTES:
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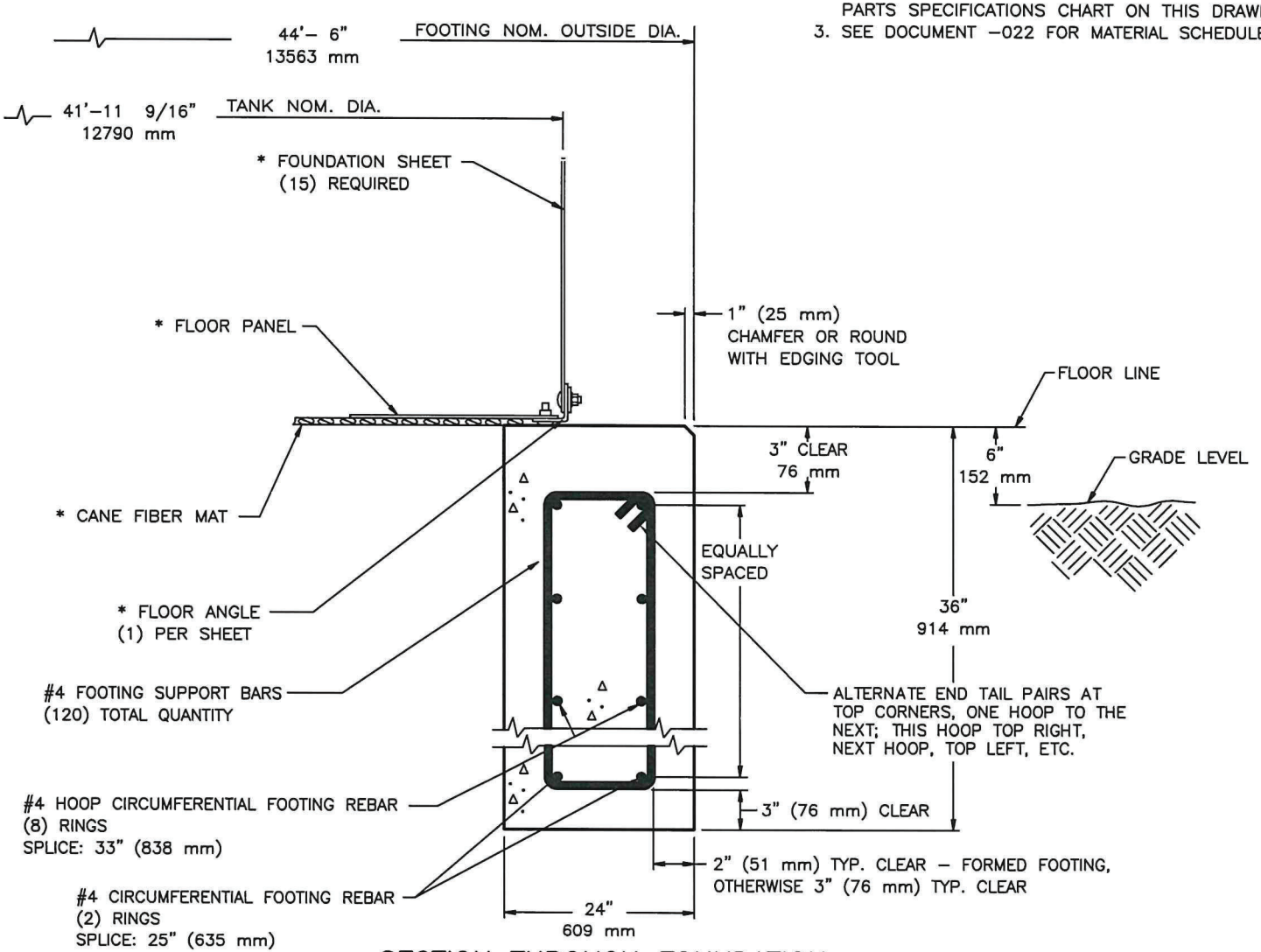
2. ITEMS INDICATED * TO BE SUPPLIED BY THE TANK MANUFACTURER. SEE * CST STORAGE PARTS SPECIFICATIONS CHART ON THIS DRAWING.
3. SEE DOCUMENT –022 FOR MATERIAL SCHEDULE.



SECTION THROUGH FOUNDATION

REL	DESCRIPTION
1	REL PER MIP 2121727 05/03/21

* CST STORAGE PARTS SPECIFICATIONS		
FLOOR ANGLES	IN.	3 X 3 X 1/4
	mm	76 X 76 X 6

CST STORAGE

DEKALB, ILLINOIS 60115

FILE: 2121727B

DRAWN BY DRT
DATE 05/03/21

42' STEEL FLOOR FND.

CALAVERAS COUNTY, CA
FOREST MEADOWS/
MURPHYS, CALIFORNIA

DRWG NO. 2121727–002

Larkspur Tank

DISCLAIMER:
UNLESS A SOILS OR GEOTECHNICAL REPORT HAS BEEN FURNISHED TO CST, THE FOUNDATION DESIGN IS BASED ON ASSUMED SOIL DESIGN PARAMETERS THAT MAY NOT REFLECT ACTUAL CONDITIONS. THE FOUNDATION DESIGN IS PRELIMINARY ONLY. DO NOT USE FOR CONSTRUCTION UNTIL SOIL DESIGN PARAMETERS ARE VERIFIED BY A SOILS ANALYSIS REPORT. CST ASSUMES NO LIABILITY AND DISCLAIMS LIABILITY FOR THE FOUNDATION DESIGN.

NOTES:
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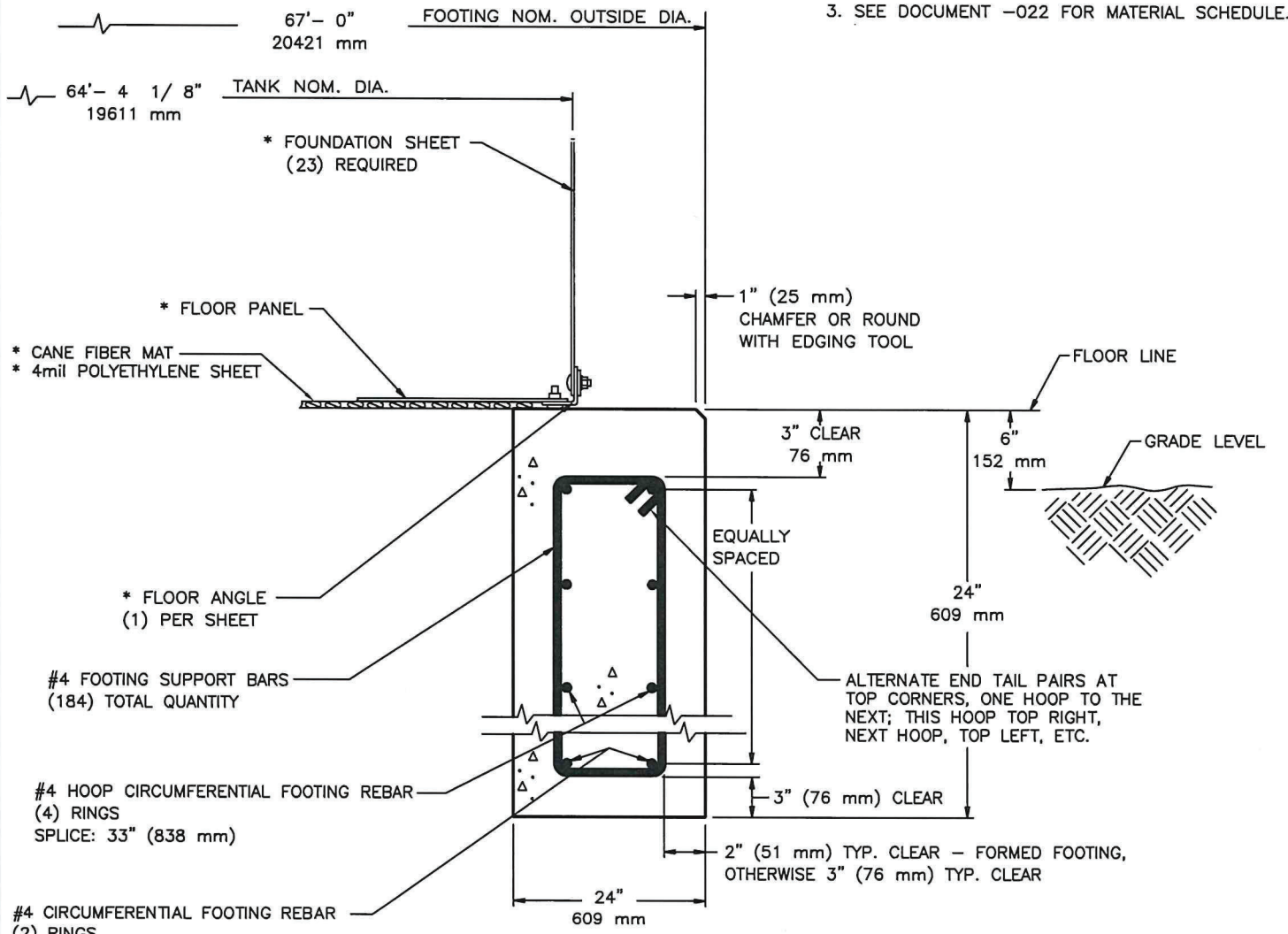
2. ITEMS INDICATED * TO BE SUPPLIED BY THE TANK MANUFACTURER. SEE * CST STORAGE PARTS SPECIFICATIONS CHART ON THIS DRAWING.
3. SEE DOCUMENT –022 FOR MATERIAL SCHEDULE.



SECTION THROUGH FOUNDATION

REL	DESCRIPTION
1	REL PER MIP 2121723 05/11/21

* CST STORAGE PARTS SPECIFICATIONS		
FLOOR ANGLES	IN.	3 X 3 X 1/4
	mm	76 X 76 X 6

CST STORAGE

DEKALB, ILLINOIS 60115

FILE: 2121723B

DRAWN BY KN
DATE 05/11/21

64' STEEL FLOOR FND.
CALAVERAS COUNTY, CA

FOREST MEADOWS/MURPHYS, CALIFORNIA

DRWG NO. 2121723–002

Heather Tank

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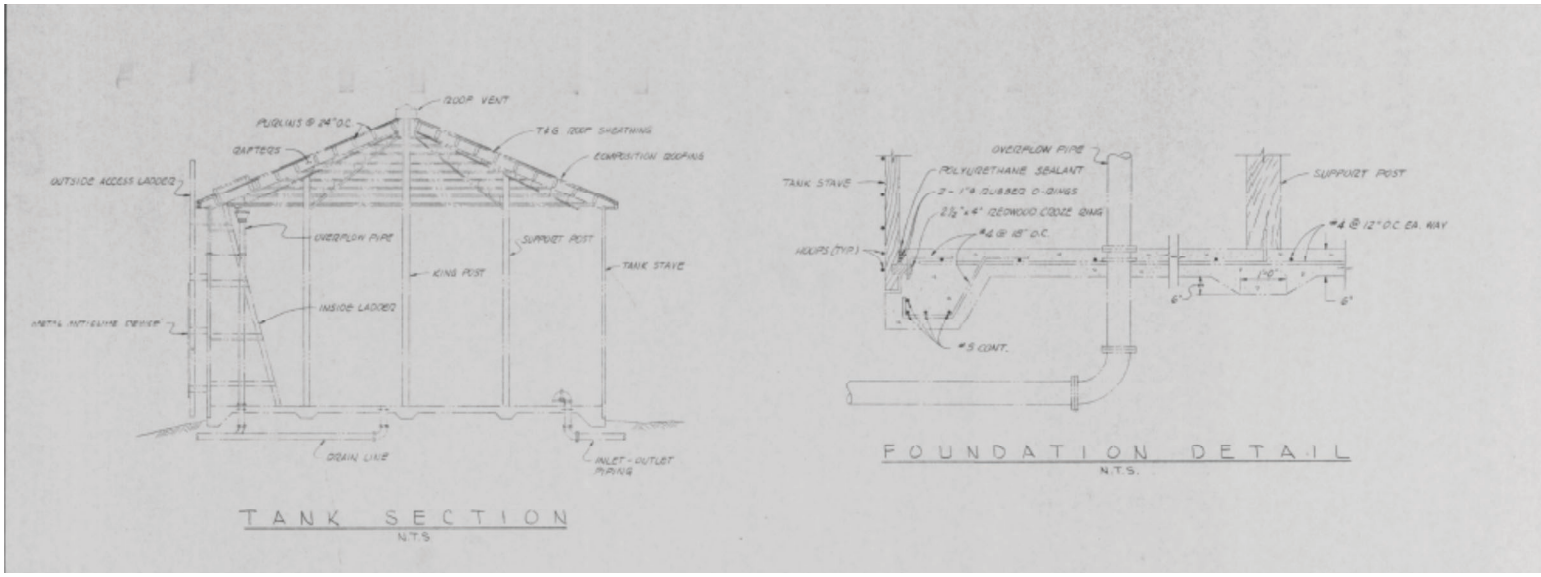
APPENDIX C: SITE PHOTOGRAPHS/EXISTING TANK AS-BUILTS

Redwood Water Storage Tanks (Typical Details)



APPENDIX D: CCWD STANDARD DRAWINGS

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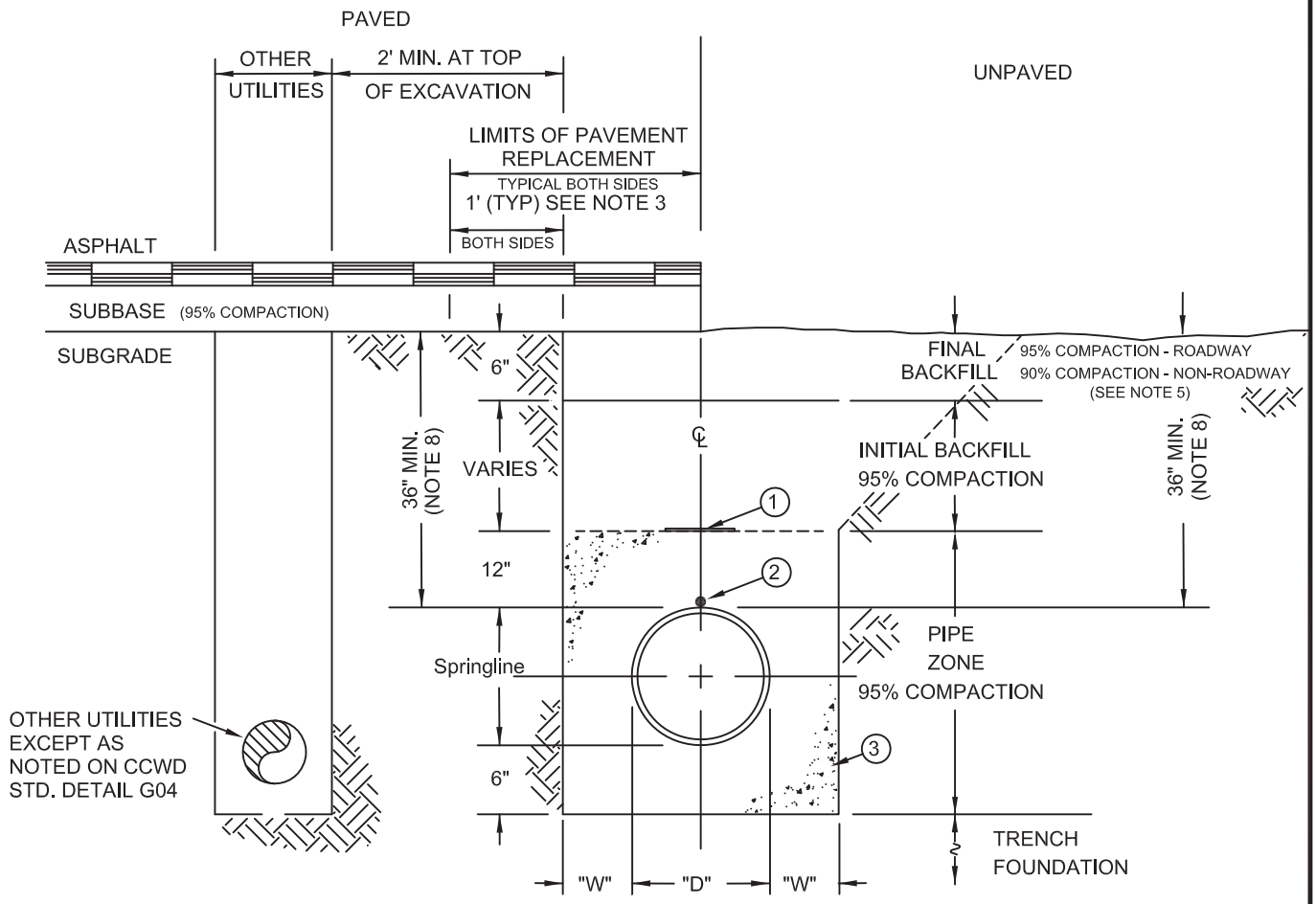


NOTES:

1. FOR EXCAVATIONS THAT WORKERS ENTER/DECEND, PERMITS SHALL BE REQUIRED FOR ALL EXCAVATIONS OVER 5 FEET IN DEPTH AND ANY EXCAVATIONS LESS THAN 5 FEET IN DEPTH IN SOILS THAT HAZARDOUS GROUND MOVEMENT MAY OCCUR.
2. PIPE TO BE LAID WITH LABEL UP ON EACH JOINT.
3. ROAD REPAIR SHALL CONFORM TO ROAD AGENCY PERMIT CONDITIONS AND SPECIFICATIONS. WIDTH OF REPAIR PER COUNTY OR CALTRANS REQUIREMENTS
4. WHEN COUNTY PUBLIC WORKS OR CALTRANS ENCROACHMENT PERMIT CONDITIONS ARE MORE RESTRICTIVE, THEY WILL TAKE PRECEDENCE.
5. EXCEPT FOR TRENCHES CUT IN ROAD SUBGRADE SLOPES AND FILLS, TRENCH WALLS ARE TO BE VERTICAL AND REMAIN WITHIN DESIGNATED LIMITS. ROADWAY INCLUDING AREAS UNDER PAVING, AREAS WITHIN 5-FT OF EDGE OF PAVEMENT, AND ALL SLOPES AND FILLS WITHIN ROADBED'S STRUCTURAL SECTION/SUBGRADE SHALL BE BACKFILLED TO 95% RELATIVE COMPACTION.
6. TRACER WIRE TO BE INCLUDED ON ALL PIPELINES INCLUDING SERVICE LATERALS.
7. SEE DETAIL G05A FOR UNSTABLE CONDITIONS.
8. PRECEDENCE SHALL BE GIVEN TO DEPTH OF COVER SHOWN ON PLAN AND PROFILE SHEETS, AND NOT LESS THAN 36-INCHES MINIMUM COVER.

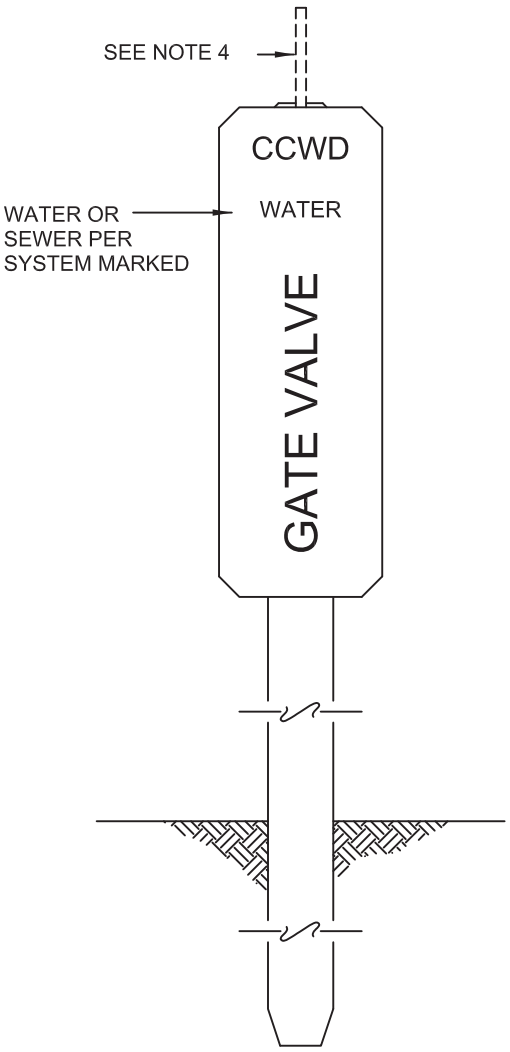
PIPE ZONE EXCAVATION LIMITS		
D	W (min.)	W (max.)
≤ 12″	6"	9"
> 12″	9"	12"

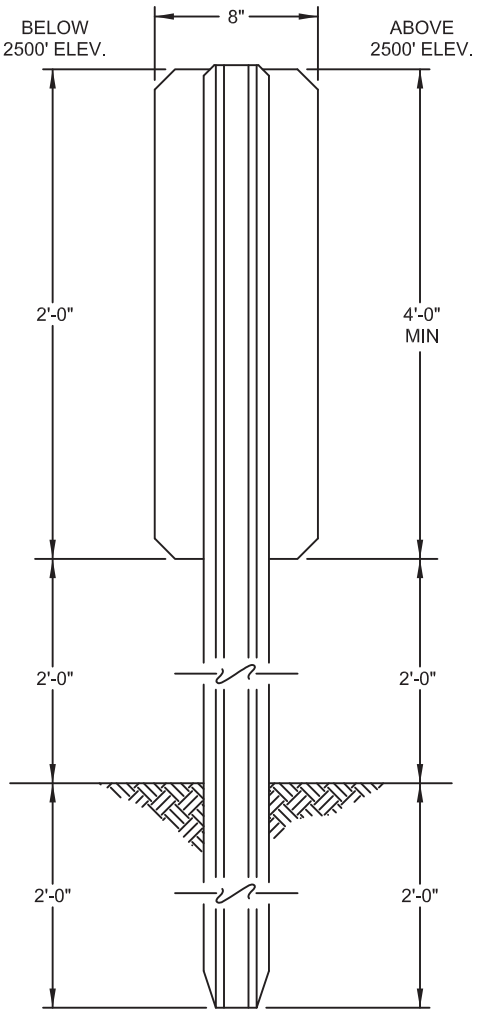
ITEM #	DESCRIPTION
①	2" WIDE WARNING TAPE (COLOR - MARKING) BLUE - "WATER" GREEN - "SEWER"
②	TRACER WIRE
③	PIPE ZONE MATERIAL

CALAVERAS COUNTY WATER DISTRICT

GENERAL DETAILS
TRENCH SECTION

DRAWN BY: CCWD STAFF	SCALE: NONE	CCWD STANDARD DRAWING NO.
APPROVED: CHARLES PALMER	DATE: AUG. 2018	G05





PADDLE MARKER PLACEMENT

SEWER	WATER
GATE VALVE	GATE VALVE
AIR RELIEF VALVE	AIR RELIEF VALVE
MANHOLES	FIRE HYDRANT

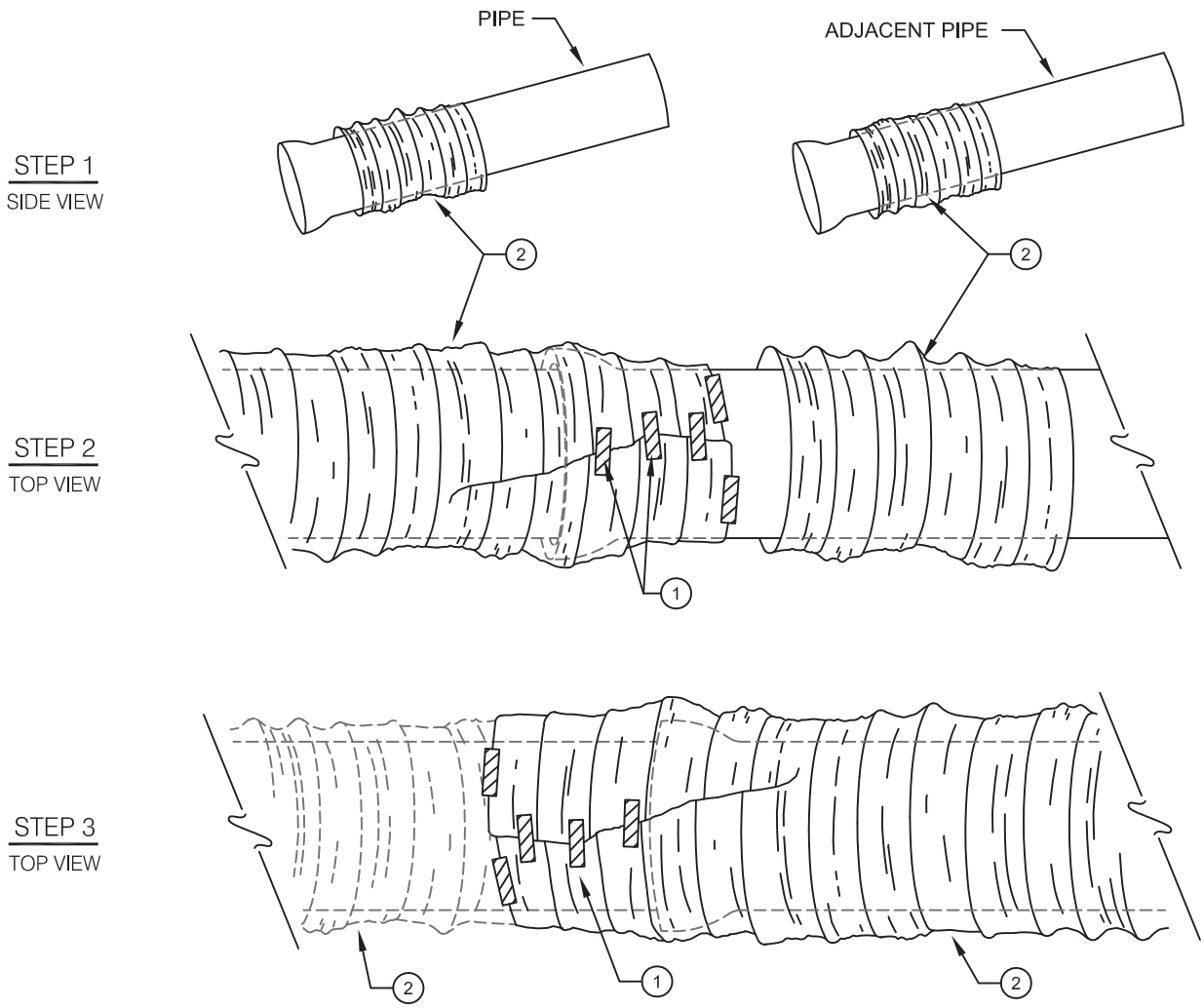
NOTES:

1. THE MARKER SHALL BE FLAT WHITE STEEL PLATE WITH BLUE LETTERING FOR WATER AND GREEN LETTERING FOR SEWER AS NOTED ABOVE
2. SEE CALTRANS STANDARD MARKER TYPE TYPE L-1 PER CALTRANS STANDARD PLANS.
3. PADDLE MARKER SHALL FACE TOWARDS APPURTENANCE
4. ABOVE 2000' ELEVATION MARKERS SHALL BE ADAPTED FOR USE WITH SNOW POLES PER CCWD FIELD STAFF.
5. PLACE SIGN OUTSIDE OF PAVED AREAS NO MORE THAN 36" FROM CCWD APPURTENANCE BEING MARKED.
6. MARKERS TO BE PLACED WHERE NOTED IN TABLE ABOVE UNLESS OTHERWISE INDICATED ON CONSTRUCTION PLANS.

CALAVERAS COUNTY WATER DISTRICT

GENERAL DETAILS
PADDLE MARKER

DRAWN BY: CCWD STAFF	SCALE: NONE	CCWD STANDARD DRAWING NO.
APPROVED: CHARLES PALMER	DATE: SEPT. 2015	G12A



FIELD INSTALLATION - POLYETHYLENE WRAP

STEP 1: PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING INTO TRENCH.

STEP 2: PULL THE TUBE OVER THE LENGTH OF THE PIPE AND TAPE TO TOP OF PIPE AT JOINT. FOLD THE MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

STEP 3: OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH UTILITY TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF THE PIPE AND TAPED IN PLACE.

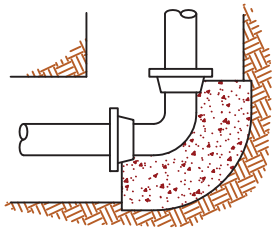
ITEM #	DESCRIPTION
1	UTILITY TAPE
2	PIPE WRAP

CALAVERAS COUNTY WATER DISTRICT

GENERAL DETAILS
POLYETHYLENE WRAP

DRAWN BY: CCWD STAFF	SCALE: NONE	CCWD STANDARD DRAWING NO.
APPROVED: CHARLES PALMER	DATE: SEPT. 2015	G13

HORIZONTAL BEND ANCHOR
CONCRETE BEARING AREA (S.F.)



90° BEND

4" = 6	10" = 14
6" = 6	12" = 20
8" = 9	

45° BEND

4" = 3	10" = 8
6" = 3	12" = 11
8" = 6	

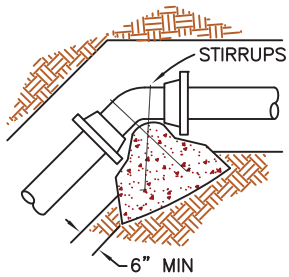
22 1/2° BEND

4" = 1.5	10" = 4
6" = 1.5	12" = 6
8" = 2	

11 1/4° BEND

4" = 1	10" = 3
6" = 1	12" = 4
8" = 2	

VERTICAL BEND ANCHOR
CONCRETE VOLUME (C.Y.)



45° BEND

4" = 1.4	10" = 3.6
6" = 1.4	12" = 5.1
8" = 2.4	

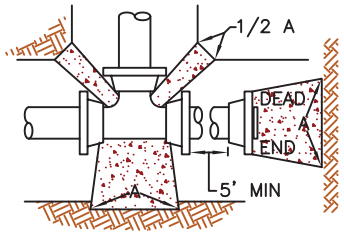
22 1/2" BEND

4" = 0.7	10" = 1.8
6" = 0.7	12" = 2.6
8" = 1.2	

11 1/4" BEND

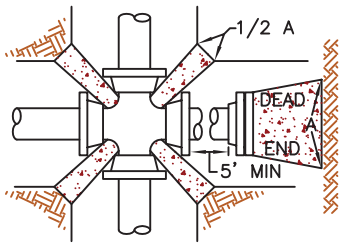
4" = 0.4	10" = 0.9
6" = 0.4	12" = 1.3
8" = 0.6	

TEE/DEAD END & PLUG
CONC. BEARING AREA (S.F.)



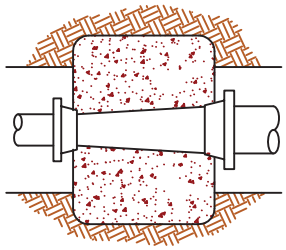
4" = 3	10" = 8
6" = 3	12" = 12
8" = 5	

CROSS with PLUG
CONC. BEARING AREA (S.F.)



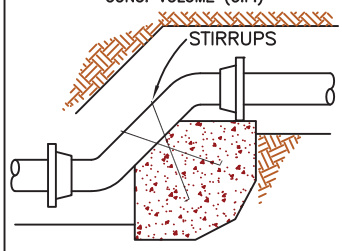
4" = 3	10" = 8
6" = 3	12" = 12
8" = 5	

REDUCER
CONC. BEARING AREA (S.F.)



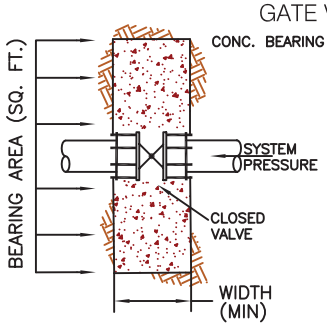
4"–6" = 10	8"–10" = 10
6"–8" = 10	10"–12" = 10

OFFSET ANCHOR BLOCK SINGLE FITTING
CONC. VOLUME (C.F.)



4" = 26	10" = 80
6" = 26	12" = 107
8" = 53	

DEAD END/CONSTRUCTION GATE VALVE
CONC. BEARING AREA (S.F.)



PIPE	150PSI	300PSI	WIDTH(MIN)
4"	3	6	18"/24"
6"	3	6	18"/24"
8"	5	10	18"/24"
10"	8	16	24"/30"
12"	12	24	24"/30"

NOTES:

1. THRUST BLOCKS TO BE CONSTRUCTED OF CLASS 3 CONCRETE.
2. AREAS GIVEN ARE FOR PIPE AT TEST PRESSURES OF 150 PSI. SIZE OF THRUST BLOCK ABOVE 150 PSIG MUST BE SCALED PROPORTIONALLY, I.E 2X FOR 300 PSIG.
3. IN SOIL WITH 2,000 PSF BEARING CAPACITY, INSTALLATIONS USING DIFFERENT TEST PRESSURES, AND/OR SOIL TYPES, SHOULD ADJUST THRUST BLOCK AREAS ACCORDINGLY, SUBJECT TO APPROVAL OF DISTRICT ENGINEER.
4. BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL, OF MINIMUM AREA SQUARE FEET.
5. PROTECT BOLTS, NUTS, THREADS, AND GASKETS FROM CONCRETE WITH 6 MIL. MIN. PVC SHEETING.
6. ALL FITTINGS SHALL BE WRAPPED (SEE DETAIL G13).
7. STIRRUPS SHALL BE MINIMUM 1/2" IN SIZE
8. TWO STIRRUPS REQUIRED ON 4" – 8" FITTINGS. FOUR STIRRUPS REQUIRED ON 10" – 12" FITTINGS.

CALAVERAS COUNTY WATER DISTRICT

WATER DETAILS
THRUST BLOCK BEARING AREA SCHEDULE

DRAWN BY: CCWD STAFF	SCALE: NONE	CCWD STANDARD DRAWING NO. W01
APPROVED: CHARLES PALMER	DATE: DEC 2015	

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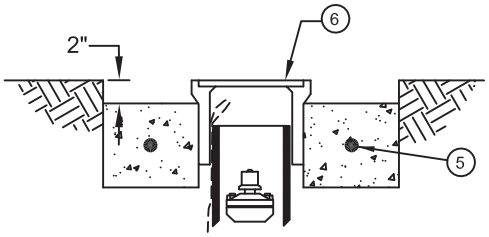
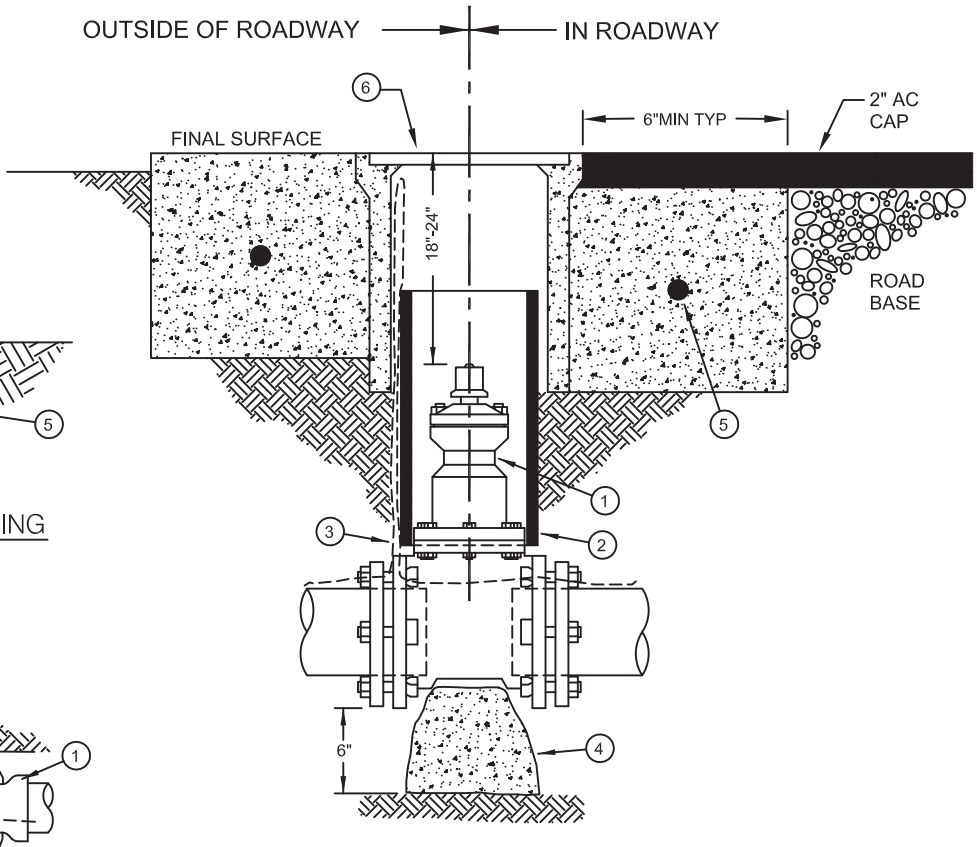
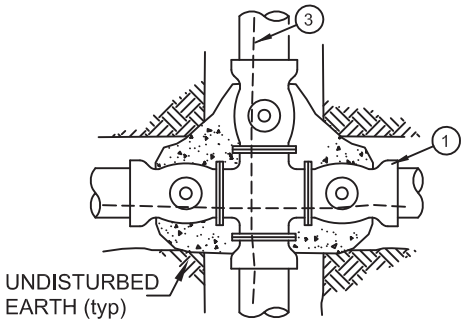


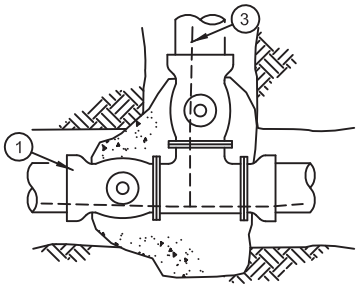
INSTALLATION IN LANDSCAPING



GATE VALVE DETAIL



CROSS INSTALLATION



TEE INSTALLATION

ITEM #	DESCRIPTION
1	GATE VALVE, RESILIENT SEAT
2	8" C900 P.V.C. RISER
3	TRACER WIRE FOR ALL INSTALLATIONS (PER DETAIL W02 & W02A)
4	CONCRETE BLOCK, 3sqft AREA, BOTTOM THRUST AREA, REQUIRED FOR VALVES 8" OR LARGER
5	#4 REBAR HOOP
6	CHRISTY G5 OR APPROVED EQUAL CONCRETE VALVE BOX BODY WITH TRAFFIC TYPE CI COVER MARKED WATER. RECESS BOX 1/4" MAX. FOR SNOW REMOVAL ABOVE 2000'.

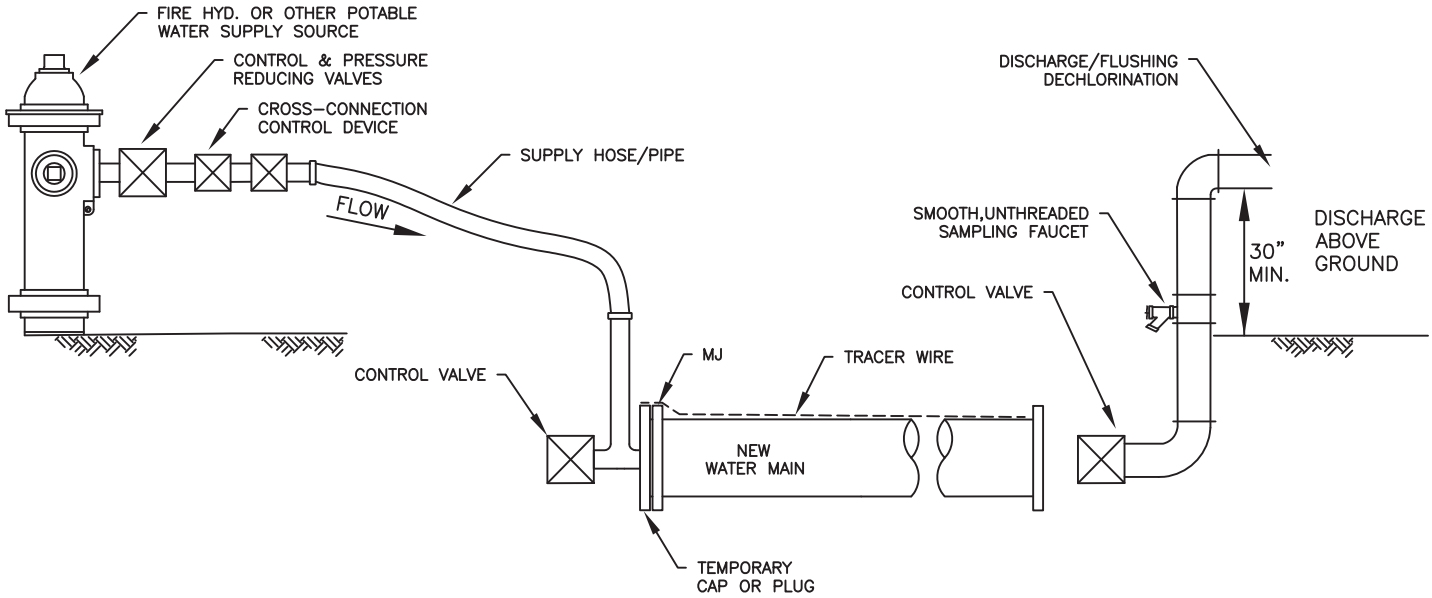
NOTES:

1. ALL GATE VALVES SHALL BE EPOXY COATED, AWWA APPROVED AND FULLY ENCAPSULATED WITH RESILIENT SEAT, MECHANICAL JOINT OR FLANGE.
2. VALVES PLACED FOR FUTURE LINE EXTENSIONS SHALL HAVE A BLIND FLANGE PLACED OVER THE OUTLET.
3. WHEN OPERATING NUT IS GREATER THAN 24" FROM FG, INSTALL STEM EXTENSIONS. (see CCWD W03A)

CALAVERAS COUNTY WATER DISTRICT

WATER DETAILS
GATE VALVE INSTALLATION

DRAWN BY:	SCALE:	CCWD STANDARD DRAWING NO.
CCWD STAFF	NONE	W03
APPROVED: CHARLES PALMER	DATE: SEPT. 2015	



ELEVATION

REQUIRED FLOW AND OPENINGS TO FLUSH PIPELINES				
PIPE DIAMETER (IN)	FLOW REQUIRED TO PRODUCE 2.5 ft/sec (APPROX.) IN MAIN (GPM)	NUMBER OF 2" TAPS ON PIPE	NUMBER OF HYDRANT OUTLETS 2 1/2–IN	4 1/2 –IN
4–8	100–400	1	1	1
12	900	2	2	1

CALAVERAS COUNTY WATER DISTRICT

WATER DETAILS
JUMPER PIPE INSTALLATION

DRAWN BY: CCWD STAFF	SCALE: NONE	CCWD STANDARD DRAWING NO.
APPROVED: CHARLES PALMER	DATE: SEPT. 2015	W12 (REV)

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