

100% DRAFT

LEWISTON COMMUNITY SERVICES DISTRICT

PROJECT MANUAL – VOLUME 1

FOR CONSTRUCTION OF

WELL 8 PROJECT

**THIS PROJECT IS FUNDED IN PART THROUGH
DRINKING WATER STATE REVOLVING FUND (DWSRF)
DWSRF PROJECT No. 5301002-004C
AND STATE OF CALIFORNIA - NATURAL RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION PER CAPITA GRANT
PROGRAM**

OCTOBER 2022

JOB No. 2399.08



**FOR INFORMATION ON THIS PROJECT, CONTACT
NICOLE HUMPHREYS OR TOM WARNOCK AT 530-244-0202**



100% DRAFT PROJECT MANUAL

WELL 8 PROJECT

FOR

LEWISTON COMMUNITY SERVICES DISTRICT

**P.O. Box 164
302 Texas Avenue
Lewiston, CA 96052**

JOB No. 2399.08

OCTOBER 2022

**PACE ENGINEERING, INC.
5155 VENTURE PARKWAY, REDDING, CALIFORNIA 96002
530-244-0202 FAX: 530-244-1978**

**FOR INFORMATION ON THIS PROJECT, CONTACT
NICOLE HUMPHREYS OR TOM WARNOCK AT 530-244-0202**

CHECKED BY _____

TABLE OF CONTENTS

VOLUME 1

<u>TITLE</u>	<u>SECTION</u>
Advertisement for Bids	00100
Instructions to Bidders.....	00200
Bid form	00410
Non-Collusion Affidavit	00420
Bid Bond	00430
Certification of Non-Segregated Facilities	00440
Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion	00450
Certification for Contracts, Grants, and Loans.....	00460
Drug-Free Workplace Certification	00465
Contractor’s Certification Regarding Workers’ Compensation Insurance.....	00470
Iran Contracting Act Certification	00475
Executive Order N-6-22 – Economic Sanctions Certification.....	00476
List of Subcontractors	00480
Information Required of Bidder.....	00490
Disadvantaged Business Enterprise (DBE) Requirements.....	00495
State Wage Requirements	00496
Davis Bacon Wage Requirements	00497
Notice of Award	00510
Agreement	00520
Notice to Proceed	00550
Performance Bond	00610
Payment Bond.....	00615
Payment Request form	00620
Certificate of Substantial Completion.....	00625
Standard General Conditions.....	00700
Supplementary Conditions	00800
Work Change Directive form	00940
Change Order form	00941
Engineer’s Supplementary Conditions.....	ESC-1

ATTACHMENTS

- A. Davis Bacon Wage Rates
- B. American Iron and Steel Provisions, De Minimis Waiver, and Prime Contractor’s Certification Letter
- C. Conservation and Mitigation Monitoring Plan
- D. Trinity Public Utilities District Preliminary Design

VOLUME 2

TECHNICAL SPECIFICATIONS

DIVISION 01 - GENERAL REQUIREMENTS

012000 Measurement and Payment

DIVISION 03 - CONCRETE

031000 Concrete forming and Accessories

032000 Concrete Reinforcing

033000 Cast-in-place Concrete

033900 Concrete Curing

036000 Grouting

DIVISION 04 - MASONRY

040513 Masonry Mortaring

040516 Masonry Grouting

042900 Engineered Unit Masonry

DIVISION 05 - METALS

055000 Metal Fabrications

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

061000 Rough Carpentry

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

072116 Blanket Insulation

074113 Metal Roof Panels

DIVISION 08 - OPENINGS

081213.13 Standard Hollow Metal Frames

081313.13 Standard Hollow Metal and FRP Doors

087100 Door Hardware

DIVISION 09 - FINISHES

099000 Painting and Coating

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

233300 Air Duct Accessories

233400 HVAC Fans

233750 Air Louvers

235400 Furnaces

DIVISION 25 - INTEGRATED AUTOMATION

255003 Flow Meters

259000 ORT and FAT Requirements

DIVISION 26 - ELECTRICAL

260519	Low-voltage Electrical Power Conductors and Cables
260526	Grounding and Bonding for Electrical Systems
260529	Hangers and Supports for Electrical Systems
260533	Raceways and Boxes for Electrical Systems

DIVISION 27 - COMMUNICATIONS

279000	Radio System
--------	--------------

DIVISION 31 - EARTHWORK

312316	Excavation
312316.13	Trenching

DIVISION 32 - EXTERIOR IMPROVEMENTS

323113	Chain Link Fences and Gates
--------	-----------------------------

DIVISION 33 - UTILITIES

330110.58	Disinfection of Water Utility Piping Systems
330550	Enclosures
330561	Concrete Manholes
331413	Public Water Utility Distribution Piping
331417	Site Water Service Utility Laterals
331419	Valves for Water Utility Service
331900.01	Water Service Metering Equipment

DIVISION 40 - PROCESS INTERCONNECTIONS

400507	Hangers and Supports for Process Piping
400553	Identification for Process Piping
400560	Process Valves
400567.13	Reduced-Pressure Zone Backflow Preventers for Process Service
402319.01	Process Piping
404213	Process Piping Insulation
407313	Pressure and Differential Pressure Gauges
408000	Miscellaneous Mechanical

DIVISION 43 - PROCESS GAS AND LIQUID HANDLING, PURIFICATION AND STORAGE EQUIPMENT

432310	Municipal Water Pumps
--------	-----------------------

DIVISION 46 - WATER AND WASTEWATER EQUIPMENT

463344	Chemical Day Tanks, Metering Pumps, and Accessories
--------	---

DRAWINGS

Sheet Numbers 1 through 23 - Bound Separately

**LEWISTON COMMUNITY SERVICES DISTRICT
LEWISTON, CA
WELL 8 PROJECT**

ADVERTISEMENT FOR BIDS

Separate sealed Bids for the construction of the Water Distribution System Replacement Project will be received by Lewiston Community Services District at the office of PACE Engineering, 5155 Venture Parkway, Redding, CA 96002, until 3:00 p.m. local time on _____, at which time the Bids will be publicly opened and read. The Project consists of installing well pump, miscellaneous process piping and appurtenances, and approximately 300 feet of water main; reconnecting services; and constructing a new well building, complete.

Engineer's Construction Cost Estimate is \$650,000 to \$795,000.

A non-mandatory, pre-bid job site visit will take place _____ starting at _____ a.m. at the Lewiston Community Services District office at 302 Texas Avenue, Lewiston, CA 96052.

Bids will be received for a single prime contract. Bids will be on a lump-sum/unit-price basis. All bids shall be evaluated on the basis of the Base Bid amount.

The Bidding Documents may be examined at the following Issuing Office:

- PACE Engineering, Inc., 5155 Venture Parkway, Redding, CA 96002

Questions regarding the Bidding Documents shall be directed to Nicole Humphreys or Tom Warnock at (530) 244-0202 or by email to nhumphreys@paceengineering.us or twarnock@paceengineering.us.

Lewiston Community Services District (Owner) is using a third-party website, CIPLIST.com to advertise these Bidding Documents. CIPLIST.com is a free service provided to review and download project Bidding Documents. CIPLIST.com is the only internet website for prospective bidders to obtain official project information and Bidding Documents.

****DISCLAIMER REGARDING BIDDING DOCUMENTS****

Electronic Bidding Documents are provided free of charge. It is the responsibility of each prospective bidder to verify the completeness of their printed Bidding Documents before submitting their bid and accompanying executed addenda acknowledgment forms. Users are cautioned that the Owner does not assume any liability or responsibility based on any defective or incomplete copying, excerpting, scanning, faxing, downloading, or printing of the Bidding Documents. 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.

Be advised that the information contained on CIPLIST.com may change and without notice to prospective bidders. It is the responsibility of each prospective bidder to check CIPLIST.com daily through the close of bids for any applicable addenda or updates.

Prospective bidders can arrange to inspect the sites by scheduling 48 hours in advance with the Owner at 530-778-0306.

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 1771.1(a)].

Copies of referenced Standard Specifications (SS) for Public Works Construction, 2018 Edition, commonly called the "Greenbook," containing the General Provisions and Standard Technical Specifications, may be obtained from Building News, Inc., 1612 South Clementine Street, Anaheim, CA 92802, (714) 517-0970.

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 California Contractor's license in accordance with the provisions of Section 3300 of the California Public Contract Code.

This project is funded in part by the State Revolving Fund (SRF), and as such a labor compliance program (LCP) in accordance with California Labor Compliance Code Section 1771.8 must be adopted and enforced. Additionally, SRF requires payment of federal prevailing wages, specifically, Davis-Bacon Act wage rules apply to all assistance agreements made in whole or in part with SRF funds. Section 1606 of the Act states as follows:

"WAGE RATE REQUIREMENTS

SEC. 1606. Notwithstanding any other provision of law and in a manner consistent with other provisions in this Act, all laborers and mechanics employed by Contractors and subcontractors on projects funded directly by or assisted in whole or in part by and through the Federal Government pursuant to this Act shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with Subchapter IV of Chapter 31 of Title 40, United States Code. With respect to the labor standards specified in this section, the Secretary of Labor shall have the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (64 Stat. 1267; 5 U.S.C. App.) and Section 3145 of title 40, United States Code."

The general prevailing wage rate of per diem wages, holidays, and over-time work for each craft, classification, or type of workman needed to execute the Contract are established by the Secretary of Labor in accordance with the Davis-Bacon Act. Copies of the Prevailing Wage Schedules may be obtained from the U.S. Department of Labor, <https://sam.gov/content>. In addition, the general prevailing wage rate of per diem wages, holidays, and over-time work for each craft, classification, or type of workman needed to execute the Contract are established by the State of California, Department of Industrial Relations. State Prevailing Wage Rates can be obtained from <https://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. If there is a difference between the minimum wage rate determined by the Secretary of Labor and the prevailing wage rates determined by the State of California for similar classifications of labor, the higher wage rate shall prevail. The Wage Decision, including modification, must be posted by the Contractor on the job site.

Additionally, projects funded with monies made available by SRF have statutory requirements commonly known as "American Iron and Steel," that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement" (AIS)) including iron and steel products provided by the Contractor pursuant to this Agreement. Manufacturers and/or

models listed herein may or may not provide materials meeting AIS. If listed manufacturers cannot provide AIS materials, it is still incumbent upon the Contractor to meet AIS requirements at no additional cost to the Owner.

The contents of this document do not necessarily reflect the views and policies of the State Water Resources Control Board (SWRCB), nor does mention of trade names or commercial products constitute endorsement or recommendation for use. (Government Code, § 7550; 40 CFR § 31.20).

Bidders are notified that financing for this project is provided pursuant to SRF Program and the Division of Financial Assistance, and that as allowed in Public Contract Code Section 22300, this Contract does provide for substitution of securities for any monies withheld by the Owner to ensure performance under this contract. Bidders are further notified that this Contract does permit retainage to be placed in escrow and/or to be invested for the benefit of the Contractor.

SRF funding for this project includes strict guidelines for Disadvantaged Business Enterprises (DBE). Good Faith Efforts (GFE) are required for all financial agreement Recipients and Bidders to ensure that all DBEs have the opportunity to compete for procurements funded by financial assistance dollars.

Six Good Faith Efforts Include:

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practical through outreach and recruitment activities. For Bidders, Tribal, State and Local Government Recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
2. Make information on forthcoming opportunities available to DBEs. Post solicitations for bids or proposals for a minimum of 30 calendar days before the bid opening date via internet, in trade journals, Building Exchange, emails, etc. The Recipients and Bidders shall post at least once in a local newspaper with the largest circulation for the area.
3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs.
4. Encourage contracting with a group of DBEs when a contract is too large for one firm to handle individually.
5. Use the services and assistance of the Small Business Administration (SBA) and Minority Business Development Agency (MBDA) of the Department of Commerce.
6. If the prime contractor awards subcontracts, the prime contractor is required to take the above

Owner reserves the right to accept or reject any and/or all Bids and to make that award which is in the best interest of the Owner.

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

These Instructions to Bidders amend or supplement the EJCDC C-200 Instructions to Bidders for Construction Contract, EJCDC® C-200 (2018 Edition).

TABLE OF CONTENTS

	Page
Article 1— Defined Terms.....	1
Article 2— Bidding Documents.....	1
Article 3— Qualifications of Bidders.....	2
Article 4— Pre-Bid Conference.....	2
Article 5— Site and Other Areas; Existing Site Conditions; Examination of Site; Owner’s Safety Program; Other Work at the Site.....	2
Article 6— Bidder’s Representations and Certifications.....	4
Article 7— Interpretations and Addenda.....	4
Article 8— Bid Security.....	4
Article 9— Contract Times.....	5
Article 10— Substitute and “Or Equal” Items.....	5
Article 11— Subcontractors, Suppliers, and Others.....	5
Article 12— Preparation of Bid.....	6
Article 13— Basis of Bid.....	7
Article 14— Submittal of Bid.....	8
Article 15— Modification and Withdrawal of Bid.....	8
Article 16— Opening of Bids.....	8
Article 17— Bids to Remain Subject to Acceptance.....	8
Article 18— Evaluation of Bids and Award of Contract.....	9
Article 19— Bonds and Insurance.....	9
Article 20— Signing of Agreement.....	9
Article 21— Sales and Use Taxes.....	10
Article 22— Contracts to Be Assigned.....	10
Article 23— Compliance Guidelines for SRF Program DBE, Equal Opportunity Requirements, and American Iron and Steel.....	10
Article 24— Worker’s Compensation Requirements.....	11
Article 25— Wage Rate Requirements.....	11
Article 26— Subcontractor Listing Law.....	12
Article 27— Registration with Department of Industrial Relations.....	13
Article 28— Bid Protest.....	13
Article 29— Securities In Lieu of Retention.....	14

ARTICLE 1—DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders have the meanings indicated in the Standard General Conditions (SGC) and Supplementary Conditions (SC). 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.
 - B. *Project Manual*— The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

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 from 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 via Bidding Documents Website.
- 2.4 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.
- 2.5 Electronic Documents
- A. Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in

printed paper versions of the documents, and for Bidder's reliance upon such derived information.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

- 3.1 Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:
- A complete Information Required of Bidder (See 00490)
- 3.2 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.3 No requirement in this Article 3 to submit information will prejudice the right of the Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4—PRE-BID CONFERENCE

- 4.1 A non-mandatory pre-Bid conference will be held at the time and location indicated in the Advertisement or Invitation to Bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.
- 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 provide electronic 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.
- B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.3 Other Site-related Documents

- A. In addition to the documents regarding existing Site conditions referred to in Paragraph 5.2.A, the following other documents relating to conditions at or adjacent to the Site are known to Owner and made available to Bidders for reference:
 - 1. Trinity Dam Community Facilities, USBR, June 12, 1956
- B. Owner has not verified the contents of these other Site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.
- C. The other Site-related documents are not part of the Contract Documents.
- D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.

5.4 Site Visit and Testing by Bidders

- A. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

5.5 Owner's 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.

5.6 Other Work at the Site

- A. Reference is made to Article 8 of the Standard General 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. Bidder 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. Engineer’s contact information for such questions is listed on the Advertisement for Bids.
- 7.3 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda through Bidding Documents Website 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 ten 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 apparent 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 will 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 seven days after the Effective Date of the Contract or 121 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 seven days after the Bid opening and if requested to do so by the Bidder in writing to the Engineer; otherwise, they will be destroyed.

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 (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 at least 15 days prior to the date for the receipt of Bids. 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. 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 the Manufacturer's Certification for Compliance with American Iron and Steel (AIS), if applicable. Refer to Manufacturer's Certification Letter provided in these Contract Documents.
- 10.2 All prices that Bidder sets forth in its Bid will 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 required by the Bid Documents, the apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors proposed for the Work.
- 11.3 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, without an increase in Bid price.
- 11.4 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 not 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 in 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 to 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 8½-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 venturer 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 acknowledgment of receipt of all Addenda, the numbers and dates of which must be filled in on the Bid Form.
- 12.10 Postal and email addresses and telephone number for communications regarding the Bid must be shown.
- 12.11 The Bid must contain evidence of 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 Total 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 shall include one separate unbound copy of the Bid Form and 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 any 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 via the Bidding Documents Website.

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 the 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. Award will be made to the lowest overall Bidder based on the Base Bid amount, subject to satisfaction of the conditions described above. The Owner reserves the right to enter into a contract with the awarded Contractor for the Base Bid.
 - C. For the determination of the apparent low Bidder when unit price Bids 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 identity 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 ten days of receipt of acceptable agreement and other requested documents from successful Bidder, 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

21.1 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—COMPLIANCE GUIDELINES FOR SRF PROGRAM DBE, EQUAL OPPORTUNITY REQUIREMENTS, AND AMERICAN IRON AND STEEL

23.1 Contractor shall comply with the contract provisions of the California State Department of Water Resources and State Water Resources Control Board Division of Financial Assistant relative to the utilization of Disadvantaged Business Enterprise (DBE) on construction contracts in California.

23.2 Bidders are notified of the requirement for affirmative action to ensure equal employment opportunity (Executive Order No. 11246) as set forth in the Equal Opportunity Requirements found in the Supplementary Conditions.

23.3 The Contractor acknowledges to and for the benefit of the Owner (“Purchaser”) and the State of California (the “State”) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as “American Iron and Steel;” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the

State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State. See Supplementary Conditions.

ARTICLE 24—WORKER’S 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 and Davis Bacon 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 Labor Code.
- 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 days' 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 works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

ARTICLE 28—BID PROTEST

28.1 Any Bid protest must be received by the Owner's place of business via fax or email by 5:00 p.m. no later than five working days following the Notice of Award (the "Bid Protest Deadline") and must comply with the following requirements:

- A. **General.** Only a Bidder who has actually submitted a Bid Proposal is eligible to submit a Bid protest against another Bidder or against the Owner's determination of the lowest responsive Bidder. Subcontractors are not eligible to submit Bid protests. A Bidder may not rely on the Bid protest submitted by another Bidder but must pursue its own protest. For purposes of this section, a "working day" means a day that the Owner is open for normal business and excludes weekends and holidays observed by Owner.
- B. **Protest Fee.** The protesting Bidder must submit a non-refundable fee in the amount of \$5,000 in the form of a cashier's check payable to the Owner, which is based upon Owner's reasonable cost to administer the Bid protest. Any such fee must be submitted to the Owner at the same time the protest is submitted.
- C. **Protest Contents.** The Bid protest must contain a complete statement of the basis for the protest and all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the person representing the protesting Bidder and the protesting Bidder.
- D. **Copy to Protested Bidder.** The protesting Bidder shall concurrently transmit by fax or by email a copy of the protest and all supporting documents, by or before the Bid Protest Deadline, to the Owner, protested Bidder, and all Bidders that submitted a Bid Proposal for this Work.
- E. **Response to Protest.** The protested Bidder may submit a written response to the protest, provided the response is received by the Owner before 5:00 p.m., within two working days after the Bid Protest Deadline or after actual receipt of the Bid protest, whichever is sooner (the "Response Deadline"). The response must include all supporting documentation responding to the basis of the protest. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person representing the protested Bidder if different from the protested Bidder.
- F. **Copy to Protesting Bidder.** A copy of the Response to Protest and all supporting documents must be concurrently transmitted by fax or by email, by or before the Bid Protest Deadline,

to the Owner, protesting Bidder and any other Bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

- G. **Exclusive Remedy.** The procedure and time limits set forth in this section are mandatory and are the Bidder's sole and exclusive remedy in the event of Bid protest. A Bidder's failure to comply with these procedures will constitute a waiver of any right to further pursue a Bid protest, including filing a Government Code Claim or initiation of legal proceedings.
- H. **Right to Award.** The Owner reserves the right to award the Contract to the Bidder it has determined to be the responsible Bidder submitting the lowest responsive Bid and to issue a Notice to Proceed with the Work notwithstanding any pending or continuing challenge to its determination. The Owner shall provide the low Bidder notice via fax or email at least five working days prior to the Notice of Award being executed by the Owner.

ARTICLE 29—SECURITIES IN LIEU OF RETENTION

29.1 As allowed in Public Contract Code Section 22300, this contract does provide for substitution of securities for any monies withheld by the Owner to ensure performance under the contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the public agency, or with a state or federally chartered bank in this state as the escrow agent, who shall then pay those moneys to the Contractor. Upon satisfactory completion of the contract, the securities shall be returned to the Contractor.

The escrow agreement used hereunder shall be null, void, and unenforceable unless it is substantially similar to the following form:

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between _____

Whose address is _____ hereinafter called "Owner,"

_____ whose address is _____

hereinafter called "Contractor" and

_____ whose address is _____

_____ hereinafter called "Escrow Agent."

For the consideration hereinafter set forth, the Owner, Contractor, and Escrow Agent agree as follows:

(1) Pursuant to Section 22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by Owner pursuant to the Construction Contract entered into between the Owner and Contractor for _____ in the amount of _____ dated _____ (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the Owner shall make payments of the retention earnings directly to the Escrow Agent. When the Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the Owner within 10 days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between the Owner and Contractor. Securities shall be held in the name of _____ and shall designate the Contractor as the beneficial owner.

(2) The Owner shall make progress payments to the Contractor for those funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.

(3) When the Owner makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until the time that the escrow created under this contract is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the Owner pays the Escrow Agent directly.

(4) Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of the Owner. These expenses and payment terms shall be determined by the Owner, Contractor, and Escrow Agent.

(5) The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the Owner.

(6) Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from the Owner to the Escrow Agent that Owner consents to the withdrawal of the amount sought to be withdrawn by Contractor.

(7) The Owner shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven days' written notice to the Escrow Agent from the Owner of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the Owner.

(8) Upon receipt of written notification from the Owner certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

(9) Escrow Agent shall rely on the written notifications from the Owner and the Contractor pursuant to Sections (5) to (8), inclusive, of this agreement and the Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

(10) The names of the persons who are authorized to give written notice or to receive written notice on behalf of the Owner and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of Owner:

On behalf of Contractor:

On behalf of Escrow Agent:

Title

Title

Title

Name

Name

Name

Signature

Signature

Signature

Address

Address

Address

At the time the Escrow Account is opened, the Owner and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

Owner

Contractor

Title

Title

Name

Name

Signature

Signature

BID FORM FOR CONSTRUCTION CONTRACT

This Bid Form amends or supplements the EJCDC C-410 Bid Form for Construction Contract, EJCDC® C-410 (2018 Edition).

TABLE OF CONTENTS

	Page
Article 1— Owner and Bidder	1
Article 2— Attachments to this Bid	1
Article 3— Basis of Bid—Lump-Sum Bid and Unit Prices.....	2
Article 4— Time of Completion	2
Article 5— Bidder’s Acknowledgements: Acceptance Period, Instructions, and Receipt of Addenda	3
Article 6— Bidder’s Representations and Certifications	3

BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—OWNER AND BIDDER

- 1.01 This Bid is submitted to: Refer to the Advertisement for Bids.
- 1.02 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

- 2.01 The following documents are submitted with and made a condition of this Bid:
- A. Notarized Non-Collusion Affidavit.
 - B. Required Bid security in the form of a Bid Bond.
 - C. Certification of Non-Segregated Facilities.Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion - Lower Tiered Covered Transactions.
 - E. Certification for Contracts, Grant, and Loans.
 - F. Drug-Free Workplace Certification.
 - G. Contractor's Certification Regarding Workers' Compensation Insurance.
 - H. Iran Contracting Act Certification.
 - I. Executive Order N-6-22 – Economic Sanctions Certification.
 - J. List of Proposed Subcontractors.
 - K. Information Required of Bidder.
 - L. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids.
 - M. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids.
 - N. Disadvantage Business Enterprise (DBE) forms.
 - O. State Wage Requirements.
 - P. Davis Bacon Wage Requirements.

ARTICLE 3—BASIS OF BID—LUMP-SUM BID AND UNIT PRICES

- 3.01 *Lump-Sum Bids - Not Used*
- 3.02 *Unit Price Bids - Not Used*
- 3.03 *Total Bid Price (Lump-Sum and Unit Prices)*

A. Bidder will perform the following Work in accordance with the Contract Documents at the indicated prices:

No.	Item	Qty	Unit	Unit Cost	Total Cost
1	Permits and miscellaneous plan(s), complete	1	LS	\$	\$
2	Site grading and road	150	CY	\$	\$
3	Excavate building foundation and install engineered fill, complete	70	CY	\$	\$
4	Building reinforced concrete foundation, footing, and slab, complete	15	CY	\$	\$
5	Building masonry, complete	1,815	SF	\$	\$
6	Building roof, complete	375	SF	\$	\$
7	Building painting, complete	1,815	SF	\$	\$
8	HVAC and appurtenances, complete	1	LS	\$	\$
9	Well 8 pump and appurtenances, complete	1	LS	\$	\$
10	Furnish and install process piping and appurtenances, complete	1	LS	\$	\$
11	Disinfection system	1	LS	\$	\$
12	Well 8 electrical, complete	1	LS	\$	\$
13	Trinity Public Utility District coordination, fees, design, and installation, complete	1	LS	\$	\$
14	Startup and testing	1	LS	\$	\$
15	Well 8 connection to distribution system	300	LF	\$	\$
16	Community Park bathrooms connection, complete	1	LS	\$	\$
17	Irrigation connection, complete	1	LS	\$	\$
18	Irrigation controller relocation, complete	1	LS	\$	\$
19	Trenching, sheeting, and shoring	1	LS	\$	\$
20	Materials on hand	1	LS	\$	\$
Total Bid Amount (Items 1-20):					\$

3.04 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 120 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 4—TIME OF COMPLETION

- 4.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 4.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 5—BIDDER’S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

- A. This Bid will remain subject to acceptance for 120 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *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.

5.03 *Receipt of Addenda*

- A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

6.01 *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, and performance of the Work.
 4. Bidder 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. 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 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 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 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 or induced any 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 this 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 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 influence 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 of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

If 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 No.: _____

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

(Public Contract Code Section 7106)

_____, 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 _____

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.
--

State of California

County of _____

Subscribed and sworn to (or affirmed) before me

on this ____ day of _____, 20____,
Date Month Year
by

(1) _____

and (2) _____
Name(s) of Signer(s)

Proved to me on the basis of satisfactory evidence
to be the person(s) who appeared before me.

Seal
Place Notary Seal and/or Stamp Above

Signature _____
Signature of Notary Public

BID BOND (PENAL SUM FORM)

<p>Bidder</p> <p>Name: [Full formal name of Bidder]</p> <p>Address (<i>principal place of business</i>): [Address of Bidder's principal place of business]</p>	<p>Surety</p> <p>Name: [Full formal name of Surety]</p> <p>Address (<i>principal place of business</i>): [Address of Surety's principal place of business]</p>
<p>Owner</p> <p>Name: Lewiston Community Services District</p> <p>Address (<i>principal place of business</i>): P.O. Box 164 302 Texas Avenue Lewiston, CA 96052</p>	<p>Bid</p> <p>Project (<i>name and location</i>): Well 8 Project Lewiston, CA</p> <p>Bid Due Date: [Enter date bid is due]</p>
<p>Bond</p> <p>Penal Sum: [Amount]</p> <p>Date of Bond: [Date]</p>	
<p>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.</p>	
<p>Bidder</p> <p style="text-align: center;">_____</p> <p style="text-align: center;"><i>(Full formal name of Bidder)</i></p>	<p>Surety</p> <p style="text-align: center;">_____</p> <p style="text-align: center;"><i>(Full formal name of Surety) (corporate seal)</i></p>
<p>By: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>	<p>By: _____</p> <p style="text-align: center;"><i>(Signature) (Attach Power of Attorney)</i></p>
<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p>Attest: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>	<p>Attest: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>
<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p><i>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.</i></p>	

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.

CERTIFICATION OF NON-SEGREGATED FACILITIES

(a) A Certification of Non-Segregated Facilities, as required by the May 9, 1967 Order (32 F.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.

(b) Contractors receiving subcontract awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of this notice to prospective subcontractors for supply and construction contracts where the subcontracts exceed \$10,000 and are not exempt from the provisions of the Equal Opportunity Clause.

(Applicable to federally assisted construction contracts and related subcontracts exceeding \$10,000 which are not exempt from the Equal Opportunity Clause.)

The federally assisted construction Contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction Contractor certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction Contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing 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. The federally assisted construction Contractor agrees that (except where he has obtained identical certifications from proposed subcontractors for specified time period) he will obtain 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, and that he will retain such certifications in his files.

Signature Date

Name and Title of Signer (Please Type)

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

**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). Copies of the regulations may be obtained by contacting the Department of Agriculture agency with which this transaction originated.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

- (1) 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 state agency.

- (2) 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

PR/Award Number or 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.

form AD-1048 (1/92)

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 Form – 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)

DRUG-FREE WORKPLACE CERTIFICATION

CONTRACTOR/APPLICANT:

The Contractor or applicant named above hereby certifies compliance with Government Code Section 8355 in matters relating to providing a drug-free workplace. The above-named Contractor or applicant will:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations, as required by Government Code Section 8355(a).
2. Establish a Drug-Free Awareness Program as required by Government Code Section 8355(b), to inform employees about all of the following:
 - (a) The dangers of drug abuse in the workplace,
 - (b) The person's or organization's policy of maintaining a drug-free workplace,
 - (c) Any available counseling, rehabilitation, and employee assistance programs, and
 - (d) Penalties that may be imposed upon employees for drug abuse violations.
3. Provide as required by Government Code Section 8355(c), that every employee who works on the proposed contract or loan:
 - (a) Will receive a copy of the company's drug-free policy statement, and
 - (b) Will agree to abide by the terms of the company's statement as a condition of employment on the contract or loan.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized legally to bind the Contractor or loan recipient to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME:

DATE EXECUTED:

EXECUTED IN COUNTY OF:

CONTRACTOR/APPLICANT SIGNATURE:

TITLE:

**CONTRACTOR'S CERTIFICATION REGARDING WORKERS' COMPENSATION
INSURANCE**

State of California

County of Trinity

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 commencing the performance of the work of this Contract.

(Name of Contractor)

by: _____

(Signature of Contractor)

Date: _____

IRAN CONTRACTING ACT CERTIFICATION

Pursuant to Public Contract Code (PCC) section 2204, the following Iran Contracting Act certification is required if your bid totals \$1,000,000 or more.

If your bid totals \$1,000,000 or more, you must complete only one of the following two paragraphs. To complete paragraph 1, check the corresponding box and complete the certification. To complete paragraph 2, simply check the corresponding box.

1. We are not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services (DGS) pursuant to PCC 2203(b), and we are not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on:

Date: _____

(Name of Contractor)

By: _____ (Printed Name)

(Title)

(Signature)

at _____ (City), _____ (State).

OR

2. We have received written permission from the Agency to submit a bid pursuant to PCC 2203(c) or (d). A copy of the written permission from the Agency is included with our bid.

EXECUTIVE ORDER N-6-22 – ECONOMIC SANCTIONS CERTIFICATION

On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (EO) regarding sanctions in response to Russian aggression in Ukraine. The EO is attached hereto.

I declare under penalty of perjury under the laws of the State of California that we have reviewed and are in compliance with EO N-6-22.

Date: _____

(Name of Contractor)

By: _____ (Printed Name)

_____ (Title)

_____ (Signature)

at _____ (City), _____ (State).

EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA

EXECUTIVE ORDER N-6-22

WHEREAS California has a strong commitment to fundamental rights and freedoms at home and around the world; and

WHEREAS the Russian Federation (Russia) has mounted aggressive, unlawful, and violent actions against Ukraine and its people, flouting these fundamental rights and freedoms; and

WHEREAS Russia's attacks on Ukraine and its people have significantly escalated since 2014, despite significant diplomatic efforts by the United States and its partners and allies to stop Russian aggression; and

WHEREAS on February 21, 2022, United States President Joseph R. Biden Jr. issued Executive Order 14065 finding that Russia's purported recognition of the so-called Donetsk People's Republic or Luhansk People's Republic regions of Ukraine contradicts Russia's commitments under the 2014 Minsk cessation of hostility agreements and further threatens the peace, stability, sovereignty, and territorial integrity of Ukraine; and

WHEREAS Executive Order 14065 expands upon a number of previous Executive Orders related to Russia's mounting actions to undermine the sovereignty and territorial integrity of Ukraine, including Executive Orders 13660, 13661, 13662, 13685, and 13849, and further federal actions may follow; and

WHEREAS on February 24, 2022, Russia launched a large-scale invasion of the sovereign nation of Ukraine and continues to conduct a lawless assault on the Ukrainian government and people; and

WHEREAS California joins the United States and other nations, states, and localities in condemning Russia's attacks on Ukraine and its people as an assault on fundamental international rules and norms that have prevailed since the Second World War; and

WHEREAS President Biden and American allies and partners around the world have announced significant economic sanctions on key Russian institutions and banks and on the architects of this war of choice, including Russian President Vladimir Putin, among others; and

WHEREAS California is proud to be home to one of the largest Ukrainian populations in the United States, and continues to stand with the government and people of Ukraine, who have fought with incredible bravery to defend their country and freedom; and

WHEREAS California supports President Biden's efforts to hold Russia accountable for violating Ukrainian sovereignty, for its disregard for the lives and well-being of the Ukrainian people, and for its hostility to freedom and democracy; and

WHEREAS thousands of Russian citizens have courageously taken to the streets to protest their government's lawless invasion of Ukraine, and many

Californian immigrants from Russia and Californians of Russian descent have marched in solidarity with these Russian protestors; and

WHEREAS California's National Guard and the U.S. government have had a nearly three-decade relationship with Ukraine working to support its Ministry of Defense, Ministry of Interior, and Armed Forces by providing military equipment and training as well as humanitarian assistance, from helping to renovate schools and providing school supplies to volunteering at orphanages; and

WHEREAS over the last twenty years, the Office of Emergency Services, along with the California National Guard and the California Emergency Medical Services Authority, has provided training and conducted exercises with the Ukrainian Ministry of Defense and Armed Forces on utilizing the Emergency Management and Incident Command System; and

WHEREAS California, which has a long history of welcoming Ukrainian and other refugees, will continue to support resettlement, in partnership with the federal government, of those seeking safety and freedom from Russia's aggression in Ukraine; and

WHEREAS according to UN agencies, Russian aggression since 2014 has internally displaced 1.5 million Ukrainians, caused an estimated 50,000 casualties, and destabilized the region, and its recent invasion of Ukraine threatens to create Europe's largest refugee crisis in decades, with more than a million refugees fleeing Ukraine in the last week; and

WHEREAS many companies in California have taken steps to limit economic transactions with Russia and Russian entities, to combat misinformation about Russia's actions in Ukraine, and to support the government and people of Ukraine; and

WHEREAS California calls upon businesses, non-governmental organizations, and public entities in the State to review their investments and contracts to ensure their compliance with economic sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law (collectively, economic sanctions), and to take actions to support the Ukrainian government and people, including by refraining from new investments in, and financial transactions with, Russian institutions or companies that are headquartered or have their principal place of business in Russia (Russian entities), not transferring technology to Russia or Russian entities, and directly providing support to the government and people of Ukraine.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California do hereby issue the following Order to become effective immediately:

IT IS HEREBY ORDERED THAT:

1. All agencies and departments subject to my authority shall review all contracts for commodities, services, and technology to determine whether they comply with existing economic sanctions; and

2. All agencies and departments subject to my authority shall terminate any contracts with any individuals or entities that are determined to be a target of economic sanctions, and shall refrain from entering into any new contracts with such individuals or entities while economic sanctions are in effect; and
3. All agencies and departments subject to my authority shall notify all contractors and grantees of their obligations to comply with economic sanctions within 45 days of this Order, and the Department of General Services and the Department of Technology shall provide guidance on such communications within 14 days of this Order; and
4. All agencies and departments subject to my authority shall direct grantees, and contractors with agreements valued at \$5 million or more, to report to the agency or department regarding their compliance with economic sanctions; and
5. All agencies and departments subject to my authority shall direct all grantees, and contractors with agreements valued at \$5 million or more, to report on steps they have taken in response to Russia's actions in Ukraine, including, but not limited to, desisting from making new investments in, or engaging in financial transactions with, Russian entities, not transferring technology to Russia or Russian entities, and directly providing support to the government and people of Ukraine; and
6. The Department of General Services and Department of Technology shall issue procurement guidance to agencies and departments regarding compliance with economic sanctions and supporting Ukrainian businesses to the extent permitted by state law.

IT IS FURTHER ORDERED that, as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 4th day of March 2022.



GAVIN NEWSOM
Governor of California

ATTEST:

SHIRLEY N. WEBER, PH.D.
Secretary of State

LIST OF SUBCONTRACTORS

NOTE: 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. Contractor shall provide all information requested below for all Subcontractors performing in excess of one-half of one percent of the total Contract.

Work to be Performed	Percent of Total Contract	Bid Quote	Subcontractor's Name, Contractor's License, and Location of Place of Business	DIR Registration No.	MBE/WBE Certification

*If a Subcontractor is a DBE, include DBE certification and complete form 4500-3 on page 00495-7.

(Add additional sheets if necessary)

BIDDER: _____

DATE: _____

INFORMATION REQUIRED OF BIDDER

The Bidder shall furnish the following information with the Bid form, except for Items 4, 7, and 8, at the time of Bid opening. Items 4, 7, and 8 shall be submitted within five calendar days post bid. Additional sheets shall be attached as required. Failure to properly complete this form will cause the bid to be non-responsive and may cause its rejection. In any event, no award will be made until all the information required of the Bidder is delivered to the Owner.

- 1) Bidder's Name, Address, and Phone Numbers:

Name: _____

Address: _____

Phone No.: _____ FAX No.: _____

- 2) Bidder's Contractor License Information:

Primary Classification: _____

California State License No. and Expiration Date: _____

Specialty classifications held, if any: _____

Department of Industrial Relations Registration No.: _____

- 3) Name, address, and telephone number of surety company and agent who will provide the required bonds on this Contract:

- 4) ATTACH TO THIS BID a financial statement, references, and other information, sufficiently comprehensive to permit an appraisal of Bidder's current financial condition. Financial statements attached to the Bid should be in a separate sealed envelope to be kept confidential and will not be subject to public review.

5) ATTACH TO THIS BID a list of five projects completed by the Contractor during the last 10 years involving projects comparable to the project defined herein. The list shall include the following information as a minimum:

- Names, address, and telephone number of Owner
- Name of project
- Location of project
- Brief description of the work involved
- Contract amount
- Date of completion of contract
- Name, address, and telephone number of Engineer

To be considered for award, the Bidder and the job site superintendent who will be assigned this project shall have completed at least five projects of similar type and complexity and comparable value. Bidders who meet the above qualifications shall ascertain before submission of their proposal that any other subcontractor listed in this Proposal shall also have these qualifications for their area of work.

6) ATTACH TO THIS BID evidence of good faith efforts to solicit small, minority, and women's businesses for work. Specifically, the six affirmative steps defined in the Advertisement for Bids and the Instructions to Bidders Article 28 of the Project Manual.

Compliance with the good faith effort shall include at minimum:

An advertised MBE/WEBE/WBE/SBE/DBE/DVBE Request for Proposal (RFP); for example, this may be available with your local Builder's Exchange.

The RFP shall include:

- Project location
- Project bid date
- Brief project description
- Trades needed on the project

A posting on the Small Business Administration "SUB-Net" website: <http://web.sba.gov/subnet/>

The SUB-NET post shall include:

- Project location
- Project bid date
- Brief project description
- Trades needed on the project

Failure to include evidence of good faith efforts and/or comply with any other requirements within this bid as defined within the Instructions to Bidders may cause the bid to be considered non-responsive and rejected.

7) Responsibility for management and installation of the electrical, instrumentation and control systems required for this project shall be by the Electrical Subcontractor (ES). This responsibility includes supervision and coordination of work performed by all electrical equipment suppliers and the System Integrator (SI). The Contractor shall disclose the name of the proposed ES that he

intends to use on this project. If the ES listed in bid documents is deemed not qualified by the Owner, the bids that include that ES will be rejected at the Owner's sole discretion and the next qualified bidder selected.

The Contractor shall address the following questions regarding the ES by checking the box in the affirmative and providing the information requested. Failure of the ES to meet the following minimum qualifications is reason enough for disqualification and bid rejection by the Owner:

Yes, the ES has a current C-10 Electrical Contractor's License.

Electrical Subcontractor's Name, Address, Phone Number and License Number:

Name: _____

Address: _____

Phone No.: _____ License Information: _____

State law requires that all personnel installing electrical components are certified by the State of California as "Electrician" or "Electrician Trainee." Apprentices may install electrical components only under direct supervision of a certified Electrician.

Yes, the ES has sufficient qualified personnel to staff the project.

ES is familiar with and understands codes and requirements from NFPA70, NFPA110, and all other local codes as required for work scope as described in the Contract Documents. ES shall be regularly engaged in similar electrical contracting for municipal water agencies wherein continuous operation of the facilities is required and short-term shutdowns must be coordinated with and at the sole discretion of the Owner. To be qualified, the ES shall have completed at least five projects of similar type and complexity and comparable value in the last 10 years.

Yes, the ES has successfully performed work of similar or greater complexity on at least five previous projects under the present company name in the last 10 years.

ATTACH TO THIS BID a list of the five projects completed by the ES during the last 10 years involving work of similar type and complexity. The list shall include the following information as a minimum:

- Names, address, and telephone number of Owner
- Name of project
- Location of project
- Brief description of the work involved
- Contract amount
- Date of completion of contract
- Name, address, and telephone number of Engineer

Yes, the ES has all insurances as defined and required by the Supplementary Conditions and as required by law.



Guidelines for Meeting the California State Revolving Fund (CASRF) Programs (Clean Water and Drinking Water SRF) Disadvantaged Business Enterprise Requirements

The Disadvantaged Business Enterprise (DBE) Program is an outreach, education, and objectives program designed to increase the participation of DBEs in the Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) Programs.

How to Achieve the Purpose of the Program

Recipients of CWSRF/DWSRF financing that are subject to the DBE requirements (recipients) are required to seek, and are encouraged to use, DBEs for their procurement needs. Recipients should award a "fair share" of sub-agreements to DBEs. This applies to all sub-agreements for equipment, supplies, construction, and services.

The key functional components of the DBE Program are as follows:

- Fair Share Objectives
- DBE Certification
- Six Good Faith Efforts
- Contract Administration Requirements
- DBE Reporting

Disadvantaged Business Enterprises are:

- Entities owned and/or controlled by socially and economically disadvantaged individuals as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note) (10% statute), and Public Law 102-389 (42 U.S.C. 4370d) (8% statute), respectively;
- Minority Business Enterprise (MBE) - entities that are at least 51% owned and/or controlled by a socially and economically disadvantaged individual as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note), and Public Law 102-389 (42 U.S.C. 4370d), respectively;
- Women Business Enterprise (WBE) - entities that are at least 51% owned and/or controlled by women;
- Small Business Enterprise (SBE);
- Small Business in a Rural Area (SBRA);
- Labor Surplus Area Firm (LSAF); or
- Historically Underutilized Business (HUB) Zone Small Business Concern or a concern under a successor program.

Certifying DBE Firms:

Under the DBE Program, entities can no longer self-certify and contractors and sub-contractors must be certified at bid opening. Contractors and sub-contractors must provide to the CASRF recipient proof of DBE certification. Certifications will be accepted from the following:

- The U.S. Environmental Protection Agency (USEPA)
- The Small Business Administration (SBA)
- The Department of Transportation's State implemented DBE Certification Program (with U.S. citizenship)
- Tribal, State and Local governments
- Independent private organization certifications

If an entity holds one of these certifications, it is considered acceptable for establishing status under the DBE Program.

Six Good Faith Efforts (GFE)

All CWSRF/DWSRF financing recipients are required to complete and ensure that the prime contractor complies with the GFE below to ensure that DBEs have the opportunity to compete for financial assistance dollars.

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practical through outreach and recruitment activities. For Tribal, State and Local Government Recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
2. Make information on forthcoming opportunities available to DBEs. Post solicitations for bids or proposals for a minimum of 30 calendar days before the bid opening date via internet, in trade journals, Building Exchange, emails, etc. The Recipients and Bidders shall post at least once in a local newspaper with the largest circulation for the area.
3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs.
4. Encourage contracting with a group of DBEs when a contract is too large for one firm to handle individually.
5. Use the services of the SBA and/or Minority Business Development Agency (MBDA) of the US Department of Commerce.
6. If the prime contractor awards subcontracts, require the prime contractor to take the above steps.

The forms listed in the table below and attached to these guidelines; must be completed and submitted with the GFE:

FORM NUMBER	FORM NAME	REQUIREMENT	PROVIDED BY	COMPLETED BY	SUBMITTED TO
SWRCB Form 4500-2 or EPA Form	DBE Sub-Contractor Participation Form	As Needed to Report Issues	Recipient	Sub-contractor	EPA DBE Coordinator
SWRCB Form 4500-3 or EPA Form	DBE Sub-Contractor Performance Form	Include with Bid or Proposal Package	Prime Contractor	Sub-Contractor	SWRCB by Recipient
SWRCB Form 4500-4 or EPA Form	DBE Sub-Contractor Utilization Form	Include with Bid or Proposal Package	Recipient	Prime Contractor	SWRCB by Recipient

The completed forms must be submitted with each Bid or Proposal. The recipient shall review the bidder’s documents closely to determine that the GFE was performed **prior** to bid or proposal opening date. Failure to complete the GFE and to substantiate completion of the GFE before the bid opening date could jeopardize CWSRF/DWSRF financing for the project. The following situations and circumstances require action as indicated:

1. If the apparent successful low bidder was rejected, a complete explanation must be provided.
2. Failure of the apparent low bidder to **perform** the GFE **prior** to bid opening constitutes a non-responsive bid. The construction contract may then be awarded to the next low, responsive, and responsible bidder that meets the requirements or the Recipient may re-advertise the project.
3. If there is a bid dispute, all disputes shall be settled **prior** to submission of the Final Budget Approval Form.

Administration Requirements

- A recipient of CWSRF/DWSRF financing must require entities receiving funds to create and maintain a Bidders List if the recipient of the financing agreement is subject to, or chooses to follow, competitive bidding requirements.
- The Bidders list must include all firms that bid or quote on prime contracts, or bid or quote on subcontracts, including both DBEs and non-DBEs.

- Information retained on the Bidder's List must include the following:
 1. Entity's name with point of contact;
 2. Entity's mailing address and telephone number;
 3. The project description on which the entity bid or quoted and when;
 4. Amount of bid/quote; and
 5. Entity's status as a DBE or non-DBE.
- The Bidders List must be kept until the recipient is no longer receiving funding under the agreement.
- The recipient shall include Bidders List as part of the Final Budget Approval Form.
- A recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the Recipient.
- A recipient must be notified in writing by its prime contractor prior to any termination of a DBE subcontractor by the prime contractor.
- If a DBE subcontractor fails to complete work under the subcontract for any reason, the recipient must require the prime contractor to employ the six GFEs if soliciting a replacement subcontractor.
- A recipient must require its prime contractor to employ the six GFEs even if the prime contractor has achieved its fair share objectives.

Reporting Requirements

For the duration of the construction contract(s), the recipient is required to submit to the State Water Resources Control Board DBE reports annually by October 10 of each fiscal year on the attached Utilization Report form (UR-334). Failure to provide this information as stipulated in the financial agreement language may be cause for withholding disbursements.

CONTACT FOR MORE INFORMATION

SWRCB, CASRF – Parisa Nejad parisa.nejad@waterboards.ca.gov

Krishton Trimp krishton.trimp@waterboards.ca.gov

General questions regarding DBE can be directed to DavisBacon@waterboards.ca.gov

US EPA, Region 9 – Alexandria Perez (415) 947-4264 perez.alexandrea@epa.gov

This page intentionally left blank.



Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

A Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE¹ subcontractor² the opportunity to describe work received and/or report any concerns regarding the funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name	
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity	

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

Please use the space below to report any concerns regarding the above funded project:

Subcontractor Signature	Print Name
Title	Date

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency’s need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

Send completed Form 4500-2 to:
 Alexandra Perez, DBE Coordinator
 US EPA, Region 9
 75 Hawthorne Street
 San Francisco, CA 94105

FORM 4500-2 (DBE Subcontractor Participation Form)



**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form**

This form is intended to capture the DBE¹ subcontractor's² description of work to be performed and the price of the work submitted to the prime contractor. A Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name		Project Name	
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity	

Contract Item Number	Description of Work Submitted from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: <input type="checkbox"/> DOT <input type="checkbox"/> SBA <input type="checkbox"/> Other: _____		Meets/exceeds EPA certification standards? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.
² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

Subcontractor Signature	Print Name
Title	Date

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

FORM 4500-3 (DBE Subcontractor Performance Form)



Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE¹ subcontractor's² and the estimated dollar amount of each subcontract. A Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name	
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Issuing/Funding Entity			

I have identified potential DBE certified subcontractors. ___ YES ___ NO If yes, please complete the table below. If no, please explain:			
Subcontractor Name/ Company Name	Company Address / Phone / Email	Estimated Dollar Amount	Currently DBE Certified?

--Continue on back if needed--

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

FORM 4500-4 (DBE Subcontractor Utilization Form)



**STATE WATER RESOURCES CONTROL BOARD – DIVISION OF FINANCIAL ASSISTANCE
DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION
CALIFORNIA STATE REVOLVING FUNDS (CASRF)
FORM UR-334**

1. Grant/Finance Agreement Number:		2. Annual Reporting Period 10/1/___ through 09/30/___		3. Purchase Period of Financing Agreement:	
4. Total Payments Paid to Prime Contractor or Sub-Contractors During Current Reporting Period: \$					
5. <u>Recipient's Name and Address:</u>			6. <u>Recipient's Contact Person and Phone Number:</u>		
7. List All DBE Payments Paid by Recipient or Prime Contractor During Current Reporting Period:					
Payment or Purchase Paid by Recipient or Prime Contractor	Amount Paid to Any DBE Contractor or Sub-Contractor For Service Provided to Recipient		Date of Payment (MM/DD/YY)	Procurement Type Code** (see below)	Name and Address of DBE Contractor of Sub-Contractor or Vendor
	MBE	WBE			
8. Initial here if no DBE contractors or sub-contractors paid during current reporting period:					
9. Initial here if all procurements for this contract are completed:					
10. Comments:					
11. Signature and Title of Recipient's Authorized Representative			12. Date		

Email Form UR-334 to:

DrinkingWaterSRF@waterboards.ca.gov OR CleanWaterSRF@waterboards.ca.gov

Questions may be directed to:

Parisa Nejad, SWRCB
Parisa.nejad@waterboards.ca.gov
Krishton Trimp, SWRCB
Krishton.trimp@waterboards.ca.gov
or DavisBacon@waterboards.ca.gov

****Procurement Type:**

1. Construction
2. Supplies
3. Services (includes business services; professional services; repair services and personnel services)
4. Equipment

**STATE WATER RESOURCES CONTROL BOARD - DIVISION OF FINANCIAL ASSISTANCE
DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION
CALIFORNIA STATE REVOLVING FUNDS**

INSTRUCTIONS FOR COMPLETING FORM UR-334

- Box 1** Grant or Financing Agreement Number.
- Box 2** Annual reporting period.
- Box 3** Enter the dates between which you made procurements under this financing agreement or grant.
- Box 4** Enter the total amount of payments paid to the contractor or sub-contractors during this reporting period.
- Box 5** Enter Recipient's Name and Address.
- Box 6** Enter Recipient's Contact Name and Phone Number.
- Box 7** Enter details for the **DBE purchases only** and be sure to limit them to the current period.
1) Use either an "R" or a "C" to represent "Recipient" or "Contractor." 2) Enter a dollar total for DBE and total the two columns at the bottom of the section. 3) Provide the payment date. 4) Enter a product type choice from those at the bottom of the page. 5) List the vendor name and address in the right-hand column
- Box 8** Initial here if no DBE contractors or sub-contractors were paid during this reporting period.
- Box 9** Initial this box only if all purchases under this financing agreement or grant have been completed during this reporting period or a previous period. If you initial this box, we will no longer send you a survey.
- Box 10** This box is for explanatory information or questions.
- Box 11** Provide an authorized representative signature.
- Box 12** Enter the date form completed.

STATE WAGE REQUIREMENTS

The Contractor and its agents shall comply with all applicable provisions of the State Labor Code regarding prevailing wages.

Pursuant to Sections 1720 et seq., and 1770 et seq., of the California Labor Code, the successful bidder shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations for public works projects of more than one thousand dollars (\$1,000). Copies of such prevailing rate or per diem wage are on file at the office of the Owner, which copies shall be made available to any interested party on request. The successful bidder shall post a copy of such determinations at each job site. A source of State Wage Rate information is <http://dir.ca.gov/DLSR>.

Davis-Bacon Requirements for DWSRF Projects

For purposes of this Exhibit only, “subrecipient” or “sub recipient” means the Recipient as defined in this Agreement.

For purposes of this Exhibit only, “recipient” or “State recipient” means the State Water Board.

I. Requirements under the Safe Drinking Water Act, Section 1452(a)(5) for Sub recipients that are Governmental Entities:

If a sub recipient has questions regarding when Davis-Bacon (DB) applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State Water Board at DavisBacon@waterboards.ca.gov or phone (916) 327-7323. The recipient or sub recipient may also obtain additional guidance from DOL’s website at <http://www.dol.gov/whd/>.

1. Applicability of the Davis-Bacon (DB) Prevailing Wage Requirements.

- (a) Under the Safe Drinking Water Act, Section 1452(a)(5), DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a sub recipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the sub recipient must discuss the situation with the recipient State before authorizing work on that site.

2. Obtaining Wage Determinations.

- (a) Sub recipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes, or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.
 - i) While the solicitation remains open, the sub recipient shall monitor www.sam.gov/content/wage-determinations weekly to ensure that the wage determination contained in the solicitation remains current. The sub recipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e., bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the sub recipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the sub recipient.
 - ii) If the sub recipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the sub recipient, obtains an extension of the 90-day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The sub recipient shall monitor <https://www.sam.gov/content/wage-determinations> on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.

- (c) Sub recipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.
- (d) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a sub recipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the sub recipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the sub recipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The sub recipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

3. Contract and Subcontract Provisions.

- (a) The Recipient shall ensure that the sub recipient(s) shall insert in full in any contract in excess of \$2,000, which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project carried out in whole or in part with assistance made available by the DWSRF, and which is subject to the labor standards provisions of any of the acts listed in Section 5.1 or the Safe Drinking Water Act, Section 1452(a)(5), the following clauses:

1. Minimum wages.

- i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in Section 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Sub recipients may obtain wage determinations from the U.S. Department of Labor's website, www.dol.gov.

ii) (A) The sub recipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- The classification is utilized in the area by the construction industry; and
- The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the sub recipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the sub recipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the sub recipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside, in a separate account, assets for the meeting of obligations under the plan or program.

2. Withholding.

- i) The sub recipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records.

- i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- ii) (A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the sub recipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the sub recipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division website at <http://www.dol.gov/whd/forms/wh347instr.htm> or its successor site.

The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the sub recipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sub recipient(s).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

- That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
- That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
- That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

- iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

- i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such

an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29 CFR part 30.
5. Compliance with Copeland Act requirements.
- i) The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
6. Subcontracts.
- i) The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may be appropriate, 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 the contract clauses in 29 CFR 5.5.
7. Contract termination; debarment.
- i) A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
8. Compliance with Davis-Bacon and Related Act requirements.
- i) All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
9. Disputes concerning labor standards.
- i) Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and sub recipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.
10. Certification of eligibility.
- i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

4. Contract Provision for Contracts in Excess of \$100,000.

(a) Contract Work Hours and Safety Standards Act. The sub recipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements.

i) 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.

i) In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefore 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)(1) of this section, in the sum of \$25 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 (a)(1) of this section.

3. Withholding for unpaid wages and liquidated damages.

i) The sub recipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall 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 (a)(2) of this section.

4. Subcontracts.

i) The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(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 (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Sub recipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Sub recipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

5. Compliance Verification.

- (a) The sub recipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(3), all interviews must be conducted in confidence. The sub recipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.
- (b) The sub recipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. Sub recipients must conduct more frequent interviews if the initial interviews or other information indicated that there is a risk that the contractor or subcontractor is not complying with DB. Sub recipients shall immediately conduct interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence."
- (c) The sub recipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The sub recipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the sub recipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Sub recipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the sub recipient shall verify evidence of fringe benefit plans and payments there under by contractors and subcontractors who claim credit for fringe benefit contributions.
- (d) The sub recipient shall periodically review contractors and subcontractor's use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.
- (e) Sub recipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at <http://www.dol.gov/whd/america2.htm>.

NOTICE OF AWARD

Date of Issuance:

Owner: Lewiston Community Services District Owner's Project No.:
Engineer: PACE Engineering, Inc. Engineer's Project No.: 2399.08
Project: Well 8 Project
Contract Name: Well 8 Project
Bidder:
Bidder's Address:

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

[Describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is **\$(Contract Price)**. 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.

[Number of copies sent] 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 **[number of copies sent]** 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): **[Describe other conditions that require Successful Bidder's compliance]**

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: Lewiston Community Services District

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Copy: Engineer

EJCDC® C-510, Notice of Award.

Copyright© 2018 National Society of Professional Engineers, American Council of Engineering Companies,
and American Society of Civil Engineers. All rights reserved.

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between Lewiston Community Services 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 consists of installing well pump, miscellaneous process piping and appurtenances, and approximately 300 feet of water main; reconnecting services; and constructing a new well building, complete.

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Well 8 Project.

ARTICLE 3—ENGINEER

3.01 The Owner has retained PACE Engineering, Inc. (“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 Engineer.

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 395 days after the date when the Contract Times commence to run.

4.03 *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 \$500 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 Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

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 at an Owner/Contractor mutually agreed 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.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments

previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

- a. 95 percent of the value of the Work completed (with the balance being retainage).
 - b. 95 percent of cost of materials and equipment not incorporated in the Work that has been approved and paid for as Materials On Hand (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 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.

6.05 *Interest*

- A. All amounts not paid when due, as provided in the General Conditions, will bear interest at the rate in accordance with Public Contract Code.

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. Engineer's Supplementary Conditions including all attachments, inclusive.
 6. Technical Specifications.
 7. Drawings (not attached but incorporated by reference) consisting of 23 sheets with each sheet bearing the following general title: Well 8 Project. Detailed Drawings shall have precedence over general Drawings.
 8. Permits from other agencies as may be required by law.
 9. Standard Plans.

10. Addenda (numbers __ to __, inclusive).
11. Exhibits to this Agreement (enumerated as follows):
 - a. Bid Form for Construction Contract.
12. 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 or the Engineer’s Supplementary Conditions.

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

This Agreement will be effective on the date of the Notice to Proceed, which is the Effective Date of the Contract.

Owner:

Lewiston Community Services District

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

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.)

Contractor:

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(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)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

License No.:

(where applicable)

State:

NOTICE TO PROCEED

Owner: Lewiston Community Services District Owner's Project No.: _____
Engineer: PACE Engineering, Inc. Engineer's Project No.: 2399.08
Contractor: _____ Contractor's Project No.: _____
Project: Well 8 Project
Contract Name: Well 8 Project
Effective Date of Contract: _____

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** 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: **[Select one of the following two alternatives, insert dates or number of days, and delete the other alternative.]**

The date by which Substantial Completion must be achieved is **[date for Substantial Completion, from Agreement]**, and the date by which readiness for final payment must be achieved is **[date for readiness, from Agreement]**.

[or]

The number of days to achieve Substantial Completion is **[number of days, from Agreement]** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of **[date, calculated from commencement date above]**; and the number of days to achieve readiness for final payment is **[number of days, from Agreement]** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of **[date, calculated from commencement date above]**.

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

[Note any access limitations, security procedures, or other restrictions]

Owner: Lewiston Community Services District
By (signature): _____
Name (printed): _____
Title: _____
Date Issued: _____
Copy: Engineer

PERFORMANCE BOND

<p>Contractor</p> <p>Name: [Full formal name of Contractor]</p> <p>Address <i>(principal place of business)</i>: [Address of Contractor's principal place of business]</p>	<p>Surety</p> <p>Name: [Full formal name of Surety]</p> <p>Address <i>(principal place of business)</i>: [Address of Surety's principal place of business]</p>
<p>Owner</p> <p>Name: Lewiston Community Services District</p> <p>Mailing address <i>(principal place of business)</i>: P.O. Box 164 302 Texas Avenue Lewiston, CA 96052</p>	<p>Contract</p> <p>Description <i>(name and location)</i>: Well 8 Project Lewiston, CA</p> <p>Contract Price: [Amount from Contract]</p> <p>Effective Date of Contract: [Date from Contract]</p>
<p>Bond</p> <p>Bond Amount: [Amount]</p> <p>Date of Bond: [Date]</p> <p><i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 16</p>	
<p>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.</p>	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<p><i>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.</i></p>	

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: **[Describe modification or enter “None”]**

PAYMENT BOND

<p>Contractor</p> <p>Name: [Full formal name of Contractor]</p> <p>Address (<i>principal place of business</i>):</p> <p>[Address of Contractor's principal place of business]</p>	<p>Surety</p> <p>Name: [Full formal name of Surety]</p> <p>Address (<i>principal place of business</i>):</p> <p>[Address of Surety's principal place of business]</p>
<p>Owner</p> <p>Name: Lewiston Community Services District</p> <p>Mailing address (<i>principal place of business</i>):</p> <p>P.O. Box 164</p> <p>302 Texas Avenue</p> <p>Lewiston, CA 96052</p>	<p>Contract</p> <p>Description (<i>name and location</i>):</p> <p>Well 8 Project</p> <p>Lewiston, CA</p> <p>Contract Price: [Amount, from Contract]</p> <p>Effective Date of Contract: [Date, from Contract]</p>
<p>Bond</p> <p>Bond Amount: [Amount]</p> <p>Date of Bond: [Date]</p> <p><i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form:</p> <p><input type="checkbox"/> None <input type="checkbox"/> See Paragraph 18</p>	
<p>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.</p>	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____	By: _____
<i>(Signature)</i>	<i>(Signature)(Attach Power of Attorney)</i>
Name: _____	Name: _____
<i>(Printed or typed)</i>	<i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____	Attest: _____
<i>(Signature)</i>	<i>(Signature)</i>
Name: _____	Name: _____
<i>(Printed or typed)</i>	<i>(Printed or typed)</i>
Title: _____	Title: _____
<p><i>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.</i></p>	

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: **[Describe modification or enter “None”]**

Contractor's Application for Payment

Owner: _____	Owner's Project No.: _____
Engineer: <u>PACE Engineering, Inc.</u>	Engineer's Project No.: _____
Contractor: _____	Contractor's Project No.: _____
Project: _____	
Contract: _____	
Application No.: _____	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 (Includes Materials On Hand) (Sum of Column F Lump Sum Total)	\$	-
5. Retainage		
a. <u>5%</u> X \$ <u> -</u> Work Completed	\$	-
6. Amount eligible to date (Line 4 - Line 5.a)	\$	-
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: _____

Progress Estimate - Lump Sum Work

Contractor's Application for Payment

Owner: _____	Owner's Project No.: _____
Engineer: PACE Engineering, Inc.	Engineer's Project No.: _____
Contractor: _____	Contractor's Project No.: _____
Project: _____	
Contract: _____	

Application No.: _____ Application Period: From _____ to _____ App Date: _____

A	B	C	D		E	F	G	H
Item No.	Description	Scheduled Value (\$)	Work Completed		Work Completed and Materials Stored to Date (D + E) (\$)	% of Scheduled Value (F / C) (%)	Balance to Finish (C - F) (\$)	
			(D + E) From Previous Application (\$)	This Period (\$)				
Original Contract								
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
Original Contract Totals		\$ -	\$ -	\$ -	\$ -			\$ -
Change Orders								
						-		-
						-		-
						-		-
						-		-
Change Order Totals		\$ -	\$ -	\$ -	\$ -			\$ -
Original Contract and Change Orders								
Project Totals		\$ -	\$ -	\$ -	\$ -			\$ -

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: _____
 Engineer: _____
 Contractor: _____
 Project: _____
 Contract: _____

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

Application No.: _____ Application Period: From _____ to _____ Application Date: _____

A	B	C	D	E	F	G	H	I	J	K	L
Bid Item No.	Description	Contract Information				Work Completed		Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
		Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)				
Original Contract											
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
Original Contract Totals					\$ -		\$ -	\$ -	\$ -		\$ -
Change Orders											
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
Change Order Totals					\$ -		\$ -	\$ -	\$ -		\$ -
Original Contract and Change Orders							\$ -	\$ -	\$ -		\$ -
Project Totals					\$ -		\$ -	\$ -	\$ -		\$ -

Materials on Hand Summary

Contractor's Application for Payment

Owner: _____	Owner's Project _____
Engineer: PACE Engineering, Inc. _____	Engineer's Project _____
Contractor: _____	Contractor's _____
Project: _____	
Contract: _____	

Application No.: _____ Application From _____ to _____ Application Date: _____

A	B	C	D	E	F	G	H	I			
Item No. (Lump Sum Tab) or Bid Item No. (Unit Price Tab)	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Description of Materials or Equipment Stored	Storage Location	Application No. When Materials Placed in Storage	Materials Stored					
						Previous Amount Stored (\$)	Amount Stored this Period (\$)	Amount Stored to Date (G+H) (\$)			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
								-			
Totals						\$	-	\$	-	\$	-

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: Lewiston Community Services District Owner's Project No.:
Engineer: PACE Engineering, Inc. Engineer's Project No.: 2399.08
Contractor: Contractor's Project No.:
Project: Well 8 Project
Contract Name: Well 8 Project

This Preliminary Final Certificate of Substantial Completion applies to:

All Work The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

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:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: None As follows:

[List amendments to Contractor's Responsibilities]

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

[List attachments such as punch list; other documents]

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

TABLE OF CONTENTS

	Page
Article 1—Definitions and Terminology.....	1
1.01 Defined Terms.....	1
1.02 Terminology	6
Article 2—Preliminary Matters.....	7
2.01 Delivery of Performance and Payment Bonds; Evidence of Insurance.....	7
2.02 Copies of Documents	7
2.03 Before Starting Construction	7
2.04 Preconstruction Conference; Designation of Authorized Representatives.....	8
2.05 Acceptance of Schedules	8
2.06 Electronic Transmittals	8
Article 3—Contract Documents: Intent, Requirements, Reuse.....	9
3.01 Intent.....	9
3.02 Reference Standards.....	9
3.03 Reporting and Resolving Discrepancies	10
3.04 Requirements of the Contract Documents.....	10
3.05 Reuse of Documents.....	11
Article 4—Commencement and Progress of the Work	11
4.01 Commencement of Contract Times; Notice to Proceed.....	11
4.02 Starting the Work.....	11
4.03 Reference Points	11
4.04 Progress Schedule.....	12
4.05 Delays in Contractor’s Progress	12
Article 5—Site; Subsurface and Physical Conditions; Hazardous Environmental Conditions	13
5.01 Availability of Lands	13
5.02 Use of Site and Other Areas.....	14
5.03 Subsurface and Physical Conditions.....	15
5.04 Differing Subsurface or Physical Conditions	16

5.05	Underground Facilities.....	17
5.06	Hazardous Environmental Conditions at Site	19
Article 6—Bonds and Insurance.....		21
6.01	Performance, Payment, and Other Bonds.....	21
6.02	Insurance—General Provisions.....	22
6.03	Contractor’s Insurance.....	24
6.04	Builder’s Risk and Other Property Insurance.....	25
6.05	Property Losses; Subrogation	25
6.06	Receipt and Application of Property Insurance Proceeds	27
Article 7—Contractor’s Responsibilities		27
7.01	Contractor’s Means and Methods of Construction	27
7.02	Supervision and Superintendence	27
7.03	Labor; Working Hours	27
7.04	Services, Materials, and Equipment	28
7.05	“Or Equals”.....	28
7.06	Substitutes	29
7.07	Concerning Subcontractors and Suppliers.....	31
7.08	Patent Fees and Royalties.....	32
7.09	Permits	33
7.10	Taxes	33
7.11	Laws and Regulations.....	33
7.12	Record Documents.....	33
7.13	Safety and Protection	34
7.14	Hazard Communication Programs	35
7.15	Emergencies.....	35
7.16	Submittals	35
7.17	Contractor’s General Warranty and Guarantee	38
7.18	Indemnification	39
7.19	Delegation of Professional Design Services	39
Article 8—Other Work at the Site.....		40
8.01	Other Work	40
8.02	Coordination	41
8.03	Legal Relationships.....	41

Article 9—Owner’s Responsibilities	42
9.01 Communications to Contractor	42
9.02 Replacement of Engineer	42
9.03 Furnish Data	42
9.04 Pay When Due.....	42
9.05 Lands and Easements; Reports, Tests, and Drawings.....	43
9.06 Insurance.....	43
9.07 Change Orders	43
9.08 Inspections, Tests, and Approvals.....	43
9.09 Limitations on Owner’s Responsibilities	43
9.10 Undisclosed Hazardous Environmental Condition.....	43
9.11 Evidence of Financial Arrangements.....	43
9.12 Safety Programs	43
Article 10—Engineer’s Status During Construction	44
10.01 Owner’s Representative.....	44
10.02 Visits to Site.....	44
10.03 Resident Project Representative.....	44
10.04 Engineer’s Authority	44
10.05 Determinations for Unit Price Work	45
10.06 Decisions on Requirements of Contract Documents and Acceptability of Work	45
10.07 Limitations on Engineer’s Authority and Responsibilities	45
10.08 Compliance with Safety Program.....	45
Article 11—Changes to the Contract	46
11.01 Amending and Supplementing the Contract	46
11.02 Change Orders	46
11.03 Work Change Directives.....	46
11.04 Field Orders.....	47
11.05 Owner-Authorized Changes in the Work	47
11.06 Unauthorized Changes in the Work.....	47
11.07 Change of Contract Price	47
11.08 Change of Contract Times.....	49
11.09 Change Proposals.....	49
11.10 Notification to Surety.....	50

Article 12—Claims.....	50
12.01 Claims.....	50
Article 13—Cost of the Work; Allowances; Unit Price Work	51
13.01 Cost of the Work	51
13.02 Allowances	55
13.03 Unit Price Work.....	55
Article 14—Tests and Inspections; Correction, Removal, or Acceptance of Defective Work	56
14.01 Access to Work.....	56
14.02 Tests, Inspections, and Approvals.....	56
14.03 Defective Work	57
14.04 Acceptance of Defective Work.....	58
14.05 Uncovering Work	58
14.06 Owner May Stop the Work	58
14.07 Owner May Correct Defective Work.....	59
Article 15—Payments to Contractor; Set-Offs; Completion; Correction Period	59
15.01 Progress Payments.....	59
15.02 Contractor’s Warranty of Title	62
15.03 Substantial Completion.....	62
15.04 Partial Use or Occupancy	63
15.05 Final Inspection	64
15.06 Final Payment.....	64
15.07 Waiver of Claims	65
15.08 Correction Period	66
Article 16—Suspension of Work and Termination	67
16.01 Owner May Suspend Work	67
16.02 Owner May Terminate for Cause.....	67
16.03 Owner May Terminate for Convenience.....	68
16.04 Contractor May Stop Work or Terminate	68
Article 17—Final Resolution of Disputes	69
17.01 Methods and Procedures.....	69
Article 18—Miscellaneous	69
18.01 Giving Notice	69
18.02 Computation of Times.....	69

18.03	Cumulative Remedies	70
18.04	Limitation of Damages	70
18.05	No Waiver	70
18.06	Survival of Obligations	70
18.07	Controlling Law	70
18.08	Assignment of Contract.....	70
18.09	Successors and Assigns	70
18.10	Headings.....	70

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, expeditors, 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.

SUPPLEMENTARY CONDITIONS

TABLE OF CONTENTS

<u>ARTICLE</u>	<u>PAGE</u>
ARTICLE 1– DEFINITIONS AND TERMINOLOGY	1
ARTICLE 2– PRELIMINARY MATTERS.....	1
ARTICLE 3– CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE	2
ARTICLE 4– COMMENCEMENT AND PROGRESS OF THE WORK	3
ARTICLE 5– SITE, SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS.....	4
ARTICLE 6– BONDS AND INSURANCE	8
ARTICLE 7– CONTRACTOR’S RESPONSIBILITIES	11
ARTICLE 8– OTHER WORK AT THE SITE	18
ARTICLE 9– OWNER’S RESPONSIBILITIES	18
ARTICLE 10– ENGINEER’S STATUS DURING CONSTRUCTION	18
ARTICLE 11– CHANGES TO THE CONTRACT	19
ARTICLE 12– CLAIMS	20
ARTICLE 13– COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK.....	21
ARTICLE 14– TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK	22
ARTICLE 15– PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD	22
ARTICLE 16– SUSPENSION OF WORK AND TERMINATION	24
ARTICLE 17– FINAL RESOLUTION OF DISPUTES	24
ARTICLE 18– MISCELLANEOUS	26
ARTICLE 19– FEDERAL REQUIREMENTS	26
ARTICLE 20– PROJECT SIGN.....	31
ARTICLE 21– CALIFORNIA STATE REQUIREMENTS	32
RELEASE OF CLAIMS.....	33

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2018 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the Standard 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 Standard General Conditions, with the prefix "SC" added thereto.

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

SC-1.01 Add the following at the end of the Paragraph 1.01.A.8:

The Change Order form to be used on this Project is EJCDC C-941 (2018).

SC-1.01 Add the following at the end of Paragraph 1.01.A.32:

A project includes all activity that an Owner is undertaking to be financed in whole or in part by programs subject to AIS requirements. The intentional splitting of a project into separate and smaller contracts or obligations to avoid AIS requirements is prohibited.

SC-1.01 Add the following at the end of Paragraph 1.01.A.50:

A Work Change Directive cannot change Contract Price or Contract Times without a subsequent Change Order.

SC-1.01 Add the following new paragraph immediately after Paragraph 1.01.A.50:

51. *Abnormal Weather Conditions* - Conditions of extreme or unusual weather for a given region, elevation, or season as determined by Engineer. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered Abnormal Weather Conditions.

ARTICLE 2—PRELIMINARY MATTERS

SC-2.02 Amend the first sentence of Paragraph 2.02.A to read as follows:

Owner shall furnish to Contractor two copies of the Contract Documents (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF).

SC-2.03 Add the following language after Paragraph 2.03.A.3:

Only items of work of value to the Owner (in the event of Contractor default) shall be included in the schedule. Items for mobilization, insurance, and other Contractor front-end costs are not allowed unless specifically included in the Proposal. The following items shall be included in the lump-sum breakdown unless otherwise approved by the Engineer:

- | | |
|-----------------------------|----|
| 1. Cleanup: | 1% |
| 2. Testing: | 2% |
| 3. Shop Drawing Submittals: | 2% |

- 4. Equipment Information (Operation and Maintenance Manuals): ½%
- 5. Bonds: 1½%

If shop drawing approval, cleanup, and testing proceed as the job progresses, then partial payments of these amounts will be made accordingly. Payment for bonds shall be paid on the first partial payment request pursuant to the invoiced amount provided by the Contractor.

The Engineer will furnish the Contractor with a list of subjects and items to include in the lump-sum price breakdown. Within fifteen (15) calendar days following the submission of this list, the Contractor shall complete and return the breakdown to the Engineer. The Contractor shall list after each item the approximate proportioned cost for that item. These costs shall include a pro-rata share of general overhead costs, bonds, insurance, mobilization, and demobilization, etc. The Contractor may be asked to verify any items that, in the Engineer's opinion, are out of balance.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.01 Add the following new paragraphs immediately following Paragraph 3.01.G:

- H. The Contractor shall keep at the Work site a copy of the Drawings and Specifications to which the Engineer shall have access at all times.
- I. Existing improvements visible at the job site, for which no specific disposition is made on the Drawings, but which could reasonably be assumed to interfere with the satisfactory completion of the improvements contemplated by the Drawings, shall be removed and disposed of by the Contractor.
- J. Precedence of Contract Documents. If there is a conflict between Contract Documents, the document highest in precedence's shall control. The precedence shall be:
 - 1. Permits from other agencies as may be required by law.
 - 2. Change Orders and Supplemental Agreements; whichever occurs last.
 - 3. Contract/Agreement.
 - 4. Addenda.
 - 5. Bid Proposal.
 - 6. Supplementary Conditions.
 - 7. Engineer's Supplementary Conditions.
 - 8. Technical Specifications.
 - 9. Drawings. Detailed Drawings shall have precedence over general Drawings.
 - 10. Standard Plans.
 - 11. Standard General Conditions.
 - 12. Reference Specifications – Greenbook, Caltrans, or other.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01 Amend Paragraph 4.01.A by striking out the following words:

In no event will the Contract Times commence to run later than the 121st day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

SC-4.03 Add the following new paragraphs immediately after Paragraph 4.03.A:

- B. The Contractor shall layout the work to the lines, grades, and dimensions as shown on the Drawings.
- C. The Drawings are based on a conventional topographic survey. The Drawings are drawn using the survey data.
- D. If the Contractor discovers any survey monuments not shown on the Drawings, the Contractor shall immediately notify the Owner's representative. If it is determined a monument will be damaged during the expected construction process, the Owner will provide a licensed surveyor to field reference and reset the monument per Section 8771 of the Professional Land Surveyors Act. If it is determined the expected construction process should not damage a monument, any costs to restore said monument if damaged is the Contractor's responsibility. The Contractor will reimburse the Owner for all associated costs for resetting the damaged monuments.
- E. Line and Grade: All work shall conform to the lines, elevations, and grades shown on the Drawings. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

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. **Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered abnormal weather conditions. Requests for time extensions due to abnormal weather conditions will be submitted to the Engineer within five days of the end of the abnormal weather condition event. It is the responsibility of the Contractor to provide the information listed in SC 4.05.C.5.b.**

SC-4.05 Add the following new paragraphs immediately after Paragraph 4.05.G:

- H. To minimize public inconvenience and possible hazard and to restore work areas to their original condition and state of usefulness as soon as practicable, the Contractor shall diligently prosecute the Work to completion. If the Engineer determines that the Contractor is failing to prosecute the Work to the proper extent, the Contractor shall, upon orders from the Engineer, immediately take steps to remedy the situation. All costs of prosecuting the Work as described herein shall be included in the Contractor's Bid. Should the Contractor fail to take the necessary steps to fully accomplish said purposes, after orders of the Engineer, the Engineer may suspend the Work in whole or part, until the Contractor takes said steps.
- I. As soon as possible under the provisions of the Specifications, the Contractor shall backfill all excavations and restore to usefulness all improvements existing prior to the start of the Work.

- J. If Work is suspended through no singular fault of the Owner, all expenses and losses incurred by the Contractor during such suspensions shall be borne by the Contractor. If the Contractor fails to properly provide for public safety, traffic, and protection of the Work during periods of suspension, the Agency may elect to do so, and deduct the cost thereof from monies due the Contractor. Such actions will not relieve the Contractor from liability.

ARTICLE 5–SITE, SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.02 Add the following language immediately after Paragraph 5.02.B:

The Contractor shall make all arrangements for disposal of excess and waste material at off-site locations and shall pay all costs involved. Arrangements may include, but not be limited to, entering into agreements with property Owners and obtaining necessary permits, licenses, and environmental clearances. Before disposing of any material off the job site, the Contractor shall furnish to the Engineer satisfactory evidence that the Contractor has entered into agreements with the property owners of the site involved and has obtained said permits, licenses, and clearances. The documentation provided shall verify that there will be no significant impact on wetlands, prime farmland, designated flood zones, or other sensitive environmental resources. Trinity County does require a grading permit be obtained if the volume of graded material is greater than 800 cubic yards and/or the total surface area to be graded is greater than 20,000 square feet.

SC-5.02 Add the following new paragraphs immediately after Paragraph 5.02.D:

- E. Protection and Restoration of Existing Improvements: The Contractor shall be responsible for the protection of public and private property adjacent to the Work and shall exercise due caution to avoid damage to such property. The Work includes but is not limited to the following:
1. The Contractor shall repair or replace all existing improvements within the right-of-way, which are not designated for removal (e.g., curbs, sidewalks, driveways, fences, walls, signs, utility installations, pavement, pavement striping, structures, etc.) which are damaged or removed as a result of its operations. When a portion of a sprinkler system within the right-of-way must be removed, the remaining lines shall be capped. Repairs and replacements shall be at least equal to existing improvements and shall match them in finish and dimension.
 2. Trees, lawns, and shrubbery that are not to be removed shall be protected from damage or injury. If damaged or removed due to Contractor's operations, they shall be restored or replaced in as nearly the original condition and location as is reasonably possible and to the satisfaction of the property owner. Lawns shall be replaced with sod matching the surrounding grass.
 3. The Contractor shall give reasonable notice to occupants or owner of adjacent property to permit them to salvage or relocate plants, trees, fences, sprinklers, and other improvements, within the right-of-way which are designated for removal and would be destroyed because of the Work.
 4. Excavated material, except that which is to be used as backfill in the adjacent trench, shall be removed concurrently with the operation. After placing backfill, all excess material shall be removed immediately from the site.
 5. All material removed from the site shall be the property of the Contractor. Payment for the removal and disposal of all material shall be considered as included in the most applicable unit price bid for this work, and no additional compensation will be allowed therefore.
 6. The Contractor shall maintain all drainage ways encountered in such a fashion that they will always be ready to accept storm flows. Drainage way interruption will not be allowed during

periods of imminent storm flows. Interruptions may occur if it appears planned operations will be completed and the drainage way made serviceable before storm flows appear imminent.

7. All costs to the Contractor for protecting, removing, and restoring existing improvements shall be included in the Bid.
- F. Traffic and Access: The Contractor's operations shall cause no unnecessary inconvenience. The access rights of the public shall be considered at all times. Unless otherwise authorized, traffic shall be permitted to pass through the Work, or an approved detour shall be provided. The following steps shall be taken to comply with this requirement:
1. Safe and adequate pedestrian and vehicular access shall be provided and maintained to fire hydrants; commercial and industrial establishments; churches, schools and parking lots; service stations and motels; hospitals; police and fire stations; and establishments of similar nature. Access to these facilities shall be continuous and unobstructed unless otherwise approved by the Engineer.
 2. Safe and adequate pedestrian zones and public transportation stops, as well as pedestrian crossings of the Work at intervals not exceeding 90m (300 feet), shall be maintained unless otherwise approved by the Engineer.
 3. Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time. If backfill has been completed to the extent that safe access may be provided, and the street is opened to local traffic, the Contractor shall immediately clear the street and driveways and provide and maintain access.
 4. The Contractor shall cooperate with the various parties involved in the delivery of mail and the collection and removal of trash and garbage to maintain existing schedules for these services.
 5. Grading operations roadway excavation and fill construction shall be conducted by the Contractor in a manner to provide a reasonably satisfactory surface for traffic. When rough grading is completed, the roadbed surface shall be brought to a smooth, even condition satisfactory for traffic.
 6. Unless otherwise authorized, work shall be performed in only one-half the roadway at one time. One-half shall be kept open and unobstructed until the opposite side is ready for use. If one-half a street only is being improved, the other half shall be conditioned and maintained as a detour.
 7. Construction materials shall not be stored in streets, roads, or highways for more than 5 days after unloading. All materials or equipment not installed or used in construction within 5 days after unloading shall be stored elsewhere by the Contractor at its expense unless authorized additional storage time.
 8. Construction equipment shall not be stored at the Work site before its actual use on the Work nor for more than 5 days after it is no longer needed. Time necessary for repair or assembly of equipment may be authorized by the Engineer.
 9. The Contractor shall normally maintain a minimum one-way traffic access on all roadways at all times. At the end of each working day the Contractor's operations shall be left such that two-way traffic shall be maintained. Flagmen shall be used at each end of the work area at any time two-way traffic is not being maintained.

10. The Contractor shall provide for continuous and uninterrupted pedestrian and vehicular access to each residence and commercial establishment adjacent to the work. The convenience of the general public and residents and the protection of persons and property are of prime importance and shall be provided for in an adequate and satisfactory manner. The Contractor shall keep the residents informed of his proposed work schedule in such a manner that residences will have adequate notice to move their vehicles if access to their dwelling will be temporarily interrupted. Any deviation from this requirement must have prior authorization from the Engineer.

11. The Contractor shall include in its Bid all costs for the above requirements.

G. Street Closures, Detours, Barricades. The Contractor shall comply with all applicable State, County, and City requirements for closure of streets. The Contractor shall provide barriers, guards, lights, signs, temporary bridges, flagpersons, and watchpersons. The Contractor shall be responsible for compliance with additional public safety requirements which may arise. The Contractor shall furnish and install signs and warning devices and promptly remove them upon completion of the Work. The following requirements apply:

1. At least 48 hours in advance of closing, partially closing or reopening, any street, alley, or other public thoroughfare, the Contractor shall notify the Police, Fire, Traffic, and Engineering Departments and comply with their requirements. Deviations must first be approved in writing by the Engineer.
2. The Contractor shall secure approval, in advance, from authorities concerned for the use of any bridges proposed by it for public use. Temporary bridges shall be clearly posted as to load limit, with signs and posting conforming to current requirements covering signs as set forth in the Traffic Manual published by the California Department of Transportation. This manual shall also apply to the street closures, barricades, detours, lights, and other safety devices required.
3. All costs involved shall be included in the Bid.

SC-5.03 Add the following new language immediately after Paragraph 5.03.C:

If applicable, the indicated elevation of the water table is that which existed on the date when test hole data was determined. It is the Contractor's responsibility to determine and allow for the elevation of groundwater at the date of project construction. A difference in elevation between groundwater shown in soil boring logs and/or test pits and groundwater actually encountered during construction will not be considered as a basis for extra work.

SC-5.03 Add the following new paragraph immediately after Paragraph 5.03.D:

- E. The following reports of explorations and tests of subsurface conditions and Drawings at or adjacent to the Site that contain Technical Data upon which the Contractor may rely:
1. Trinity Dam Community Facilities, USBR, June 12, 1956.

Copies of reports and drawings itemized in this section that are not included with Bidding Documents may be examined at PACE Engineering, 5155 Venture Parkway, Redding, CA 96002 during regular business hours. These reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which the Contractor may rely as identified and established above are incorporated therein by reference. Contractor is not entitled to rely upon other information and data utilized by Engineer in the preparation of the Drawings and Specifications.

- F. The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, and

uncertainties of weather, drainage courses, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the work and all other matters that can in any way affect the work or the cost thereof under this Contract.

- G. The Contractor further acknowledges that he has satisfied himself as to the character, quality, and quantity of surface and subsurface materials to be encountered from inspecting the site, review of information made available to him by the Engineer and Owner, as well as from information presented by the Drawings and Specifications made a part of this Contract. Any failure by the Contractor to acquaint himself with all the available information will not relieve him from responsibility for properly estimating the difficulty or cost of successfully performing the work.

SC-5.05 Add the following new paragraphs immediately after Paragraph 5.05.A.5:

6. Location: The locations of known existing utilities are shown on the Drawings. Where underground main distribution conduits, such as water, gas, sewer, electric power, telephone, or cable television are shown on the Drawings, the Contractor shall take the following steps to locate existing utilities:
- a. As provided in Section 4216 of the California Government Code, at least 2 working days prior to commencing any excavation, the Contractor shall contact the regional notification center (Underground Service Alert of Northern California and Nevada) and obtain an inquiry identification number.
 - b. The California Department of Transportation (DOT) is not required by Section 4216 to become a member of the regional notification center. The Contractor shall contact DOT for location of its subsurface installations.
 - c. The Contractor shall determine the location and depth of all utilities, which have been marked by the respective owners and which may affect or be affected by its operations. If no pay item is provided in the Contract for this work, full compensation for such work shall be considered as included in the prices bid for other items of work.
7. Protection: The Contractor shall not interrupt the service function or disturb the support of any utility without authority from the utility owner or order from the Owner. All valves, switches, vaults, and meters shall be maintained readily accessible for emergency shutoff. The Contractor shall protect existing utilities as follows:
- a. Where protection is required to ensure support of utilities located as shown on the Drawings, the Contractor shall, unless otherwise provided, furnish, and place the necessary protection at its expense.
 - b. Upon learning of the existence and location of any utility omitted from or shown incorrectly on the Drawings, the Contractor shall immediately notify the Engineer in writing. When authorized by a Work Change Directive, the Contractor will be paid extra to support or protect the utility.
 - c. The Contractor shall immediately notify the Engineer and the utility Owner if any utility is disturbed or damaged. The Contractor shall bear the costs of repair or replacement of any utility damaged if located in accordance with SGC 5.05.
 - d. When placing concrete around or contiguous to any non-metallic utility installation, the Contractor shall at his expense:
 - Furnish and install a 50 mm (2-inch) cushion of expansion joint material or other similar resilient material; or

- Provide a sleeve or other opening which will result in a 50 mm (2-inch) minimum-clear annular space between the concrete and the utility; or
 - Provide other acceptable means to prevent embedment in or bonding to the concrete.
- e. Where concrete is used for backfill or for structures which would result in embedment, or partial embedment, of a metallic utility installation; or where the coating, bedding or other cathodic protection system is exposed or damaged by the Contractor's operations, the Contractor shall notify the Engineer and arrange to secure the advice of the affected utility owner regarding the procedures required to maintain or restore the integrity of the system.
8. Removal: Unless otherwise specified, the Contractor shall remove all interfering portions of utilities shown on the Drawings or indicated in the Bid documents as "abandoned" or "to be abandoned in place." Before starting removal operations, the Contractor shall ascertain from the Owner whether the abandonment is complete, and the costs involved in the removal and disposal shall be included in the Bid for the items of work necessitating such removals.
9. Relocation: When the Drawings or Specifications provide for the Contractor to alter, relocate, or reconstruct a utility, all costs for such work shall be included in the Bid for the items of work necessitating such work. Temporary or permanent relocation or alteration of utilities requested by the Contractor for its convenience shall be its responsibility and it shall make all arrangements and bear all costs.

SC-5.06 Add the following new paragraph immediately after Paragraph 5.06.A.3:

4. The following reports and Drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site contain Technical Data upon which the Contractor may rely:

The vast majority of the existing water distribution system is made of asbestos cement (AC) pipe. Contractor shall take all necessary precautions required by law when encountering the AC pipe.

ARTICLE 6—BONDS AND INSURANCE

SC-6.03 Add the following new paragraphs immediately after Paragraph 6.03.C:

- D. The limits of liability for insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation and Related Coverages

State:	Statutory
Employer's Liability:	\$1,000,000

2. Contractor's Commercial General Liability

General Aggregate:	\$2,000,000
Products-Completed Operations Aggregate:	\$1,000,000
Personal and Advertising Injury:	\$1,000,000
Bodily Injury and Property Damage (Each Occurrence):	\$1,000,000

3. Automobile Liability

Combined Single Limit:	\$1,000,000
------------------------	-------------

4. Excess or Umbrella Liability

General Aggregate:	\$2,000,000
Each Occurrence:	\$2,000,000

5. Pollution, Environmental Impairment, and Hazardous Waste Liability

General Aggregate:	\$2,000,000
Each Occurrence:	\$2,000,000

- E. *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 additional insureds on separate endorsements the Owner, Engineer, Engineer's Consultants, Trinity County, and State of California and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded.
- F. *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).
- G. *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.
 4. Contractor's Liability Insurance shall indemnify, hold harmless, protect and defend Owner, Engineer, Engineer's Consultants, Trinity County, State of California, and its officers, employees, agents and representatives from any loss, suit, action or claim brought for, or on account of any violation of law, ordinance, rule, or regulation, or any injury, damage, or loss, including death, caused by acts or omissions of Contractor, its employees, subcontractors, or agents; or in any way arising from, or related to the Project.
- H. *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.
- I. *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.
- 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.
- 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.
- 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 \$1,000,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.

M. *Contractor's Pollution Liability Insurance*: Contractor is not required to purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations.

SC-6.04 Delete Paragraph 6.04.D. in its entirety and insert the following in its place:

D. Partial Occupancy or Use by Owner: Contractor is not required to maintain Builder's Risk Insurance.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements*: Builder's risk insurance is not required.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

SC-7.03 Add the following language at the end of Paragraph 7.03.A:

The Engineer and/or the Owner has the authority to determine if workmen are incompetent or otherwise unsuitable, and the Contractor shall remove any such worker upon written request by either the Engineer and/or the Owner.

SC-7.03 Delete Paragraph 7.03.C in its entirety and insert the following in its place:

C. The working hours for the project shall be between 7 a.m. and 3:30 p.m. Monday through Friday. No work will be allowed on Saturdays, Sundays, or holidays officially recognized by the Owner, unless otherwise approved by the Owner and Engineer. The Contractor is prohibited from excavation activities when Owner's staff is not working. The Contractor shall notify the Engineer in writing of his work schedule including hours to be worked and days off. The Contractor's representative shall be available at the work site during the hours indicated in the work schedule. The work schedule will be used by the Engineer to schedule construction observation personnel. No work shall be permitted outside the hours and days indicated by the schedule unless otherwise approved by the Engineer in writing.

SC-7.04 Add the following language to the end of Paragraph 7.04.C:

When considered necessary and directed by the Engineer, materials and equipment shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground; and/or they shall be placed under cover. Electrical equipment, devices, and motors shall be placed in dry and warm storage as approved by the Engineer.

SC-7.04 Add the following new paragraph immediately after Paragraph 7.04.C:

D. All iron and steel products must meet American Iron and Steel requirements.

SC-7.04 Add the following new paragraph immediately after Paragraph 7.04.D:

E. For projects utilizing a de minimis waiver, Contractor shall maintain an itemized list of non-domestically produced iron and steel incidental components and ensure that the cost is less than 5% of total materials cost for project.

SC-7.05 Amend the third sentence of Paragraph 7.05.A by striking out the following words:

Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted,

SC-7.05 Add "and" at the end of Paragraph 7.05.A.1.a.2:

SC-7.05 Amend Paragraph 7.05.A.1.a.3 by striking out ";and" and adding a period at the end of the sentence.

SC-7.05 Delete Paragraph 7.05.A.1.a.4 in its entirety.

SC-7.05 Amend Paragraph 7.05.B by adding the following text to the end of the paragraph:

Contractor shall include a Manufacturer's Certification letter for compliance with American Iron and Steel requirements and support data, if applicable. Refer to Manufacturer's Certification Letter provided in these Contract Documents.

SC-7.05 Add the following at the end of Paragraph 7.05.C:

Prior to Bidding, request for Engineer's clarification of materials and equipment considered "or equal" prior to the Effective Date of the Agreement must be received by the Engineer at least 10 days prior to the date for receipt of Bids.

SC-7.06 Remove "and" from the end of Paragraph 7.06.A.3.a.2.

SC-7.06 Remove period and add ";and" to the end of Paragraph 7.06.A.3.a.3.

SC-7.06 Add the following new paragraph immediately after Paragraph 7.06.A.3.a.3):

4) comply with American Iron and Steel by providing Manufacturer's Certification letter of American Iron and Steel compliance, if applicable. Refer to Manufacturer's Certification Letter provided in these Contract Documents.

SC-7.06 Add the following new paragraph immediately after Paragraph 7.06.F:

G. Substitution of Materials and Equipment: The Drawings are typically detailed on the basis of specified materials and equipment. Due to the variation in available equipment, there are a few cases where it has been necessary to base the Drawings on one manufacturer's equipment only. In these cases, the second-named manufacturer and other approved equipment shall be considered as substituted equipment. Where any modifications or deviations from the Contract Drawings are required by the substitution of approved materials or equipment, the Contractor shall prepare and submit to the Engineer detailed drawings showing all modifications in structures, reinforcing steel, piping, electrical and mechanical work, etc., to adapt the Contract Drawings to the alternate materials or equipment; the Engineer will review such drawings and either approve them or indicate thereon changes necessary to comply with the project requirements. The Contractor shall revise any unapproved drawings and resubmit them to the Engineer.

The cost of the above drawings required as a result of substituted items of materials or equipment and the actual construction cost increase, if any, shall be included in the prices bid in the Proposal.

SC-7.07 Amend Paragraph 7.07.A by adding the following text to the end of the paragraph:

The Contractor shall not award work valued at more than fifty percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner, except that any designated "Specialty Items" may be performed by subcontract and the amount of any such "Specialty Items" so performed may be deducted from the Contract Price before computing the amount required to be performed by the

Contractor with its own organization. "Specialty Items" will be identified in the Bid or Proposal. Where an entire item is subcontracted, the value of work subcontracted will be based on the Contract Unit Price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the Contract Unit Price. This will be determined from information submitted by the Contractor, and subject to approval by the Engineer.

SC-7.07 Delete Paragraph 7.07.B in its entirety.

SC-7.07 Amend the second sentence of Paragraph 7.07.E by striking out:

"Owner also may require Contractor to retain specific replacements; provided, however, that"

SC-7.12 Amend Paragraph 7.12.A by adding the following after "written interpretations and clarifications,":

Manufacturers' Certification letters,

SC-7.13 Add the following language after the first sentence of Paragraph 7.13.A:

This requirement will apply continuously and not be limited to normal working hours.

SC-7.13 Add the following language at the end of Paragraph 7.13.C.3:

The Contractor shall thoroughly inspect the roadway surface over which his equipment will move and attempt to schedule only that equipment which will not cause damage to existing roadways and/or adjoining concrete curbs, gutters, and sidewalks. If it is necessary to use equipment that damages the roadway, the Contractor shall be liable for this damage regardless of whether the road meets current design standards, or whether loads by said equipment are allowable. The intent is that the Contractor be responsible for any damage caused by this project. Repair made necessary from non-compliance shall be as directed by the Engineer with the intent that repairs such as patching, grading, etc., shall result in a road surface at least equal to that on adjacent roadway. Appearance of the area shall weigh heavily in determining the extent of repair to be ordered. Cost of repairs shall be borne entirely by the Contractor.

SC-7.13 Add the following subparagraphs after Paragraph 7.13.E:

1. The Contractor shall maintain at his office or other well-known place at the job site, all articles necessary for giving first aid to the injured and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons (including employees) who may be injured on the job site.
2. The Duty of the Engineer to conduct construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site.
3. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or in person to both the Engineer and the Owner. In addition, the Contractor must promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to the site, giving full details and statements of witnesses.

SC-7.13 Add the following new paragraph immediately after Paragraph 7.13.J:

- K. 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. If such plan varies from the shoring system standards approved by OSHA, the plan shall be prepared by a registered

civil or structural engineer. Nothing in this section shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders.

- L. Safety Orders. The Contractor shall have at the Work site copies or suitable extracts of: Construction Safety Orders, Tunnel Safety Orders, and General Industry Safety Orders issued by the State Division of Industrial Safety. The Contractor shall comply with provisions of these and all other applicable laws, ordinances, and regulations.
- M. Use of Explosives. Explosives may not be used on this project.
- N. Special Hazardous Substances and Processes. Materials that contain hazardous substances or mixtures may be required on the Work. A Safety Data Sheet as described in Section 5194 of the California Code of Regulations shall be requested by the Contractor from the manufacturer of any hazardous products used.

Material usage shall be accomplished with strict adherence to California Division of Industrial Safety requirements and all manufacturer warnings and application instructions listed on the Safety Data Sheet and on the product container label.

The Contractor shall notify the Engineer if a specified product cannot be used under safe conditions.

O. Confined Spaces.

- 1. Confined Space Entry Program. The Contractor shall be responsible for implementing, administering, and maintaining a confined space entry program (CSEP) in accordance with Sections 5156, 5157, and 5158, Title 8, California Code of Regulations (CCR).

Prior to starting the Work, the Contractor shall prepare and submit its comprehensive CSEP to the Engineer. The CSEP shall address all potential physical and environmental hazards and contain procedures for safe entry into confined spaces, including, but not limited to the following:

- Training of personnel
- Purging and cleaning the space of materials and residue
- Potential isolation and control of energy and material inflow
- Controlled access to the space
- Atmospheric testing of the space
- Ventilation of the space
- Special hazards consideration
- Personal protective equipment
- Rescue plan provisions

The Contractor's submittal shall include the names of its personnel, including subcontractor personnel, assigned to the project that will have CSEP responsibilities, their CSEP training, and their specific assignment and responsibility in carrying out the CSEP.

- 2. Permit-Required Confined Spaces. Entry into permit-required confined spaces as defined in Section 5157, Title 8, CCR may be required as a part of the Work. All manholes, tanks, vaults, pipelines, excavations, or other enclosed or partially enclosed spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. The Contractor shall implement a permit space program prior to performing any work in a permit required confined space. A copy of the permit shall be available at all times for review by Contractor and Agency personnel at the Work site.

3. Payment. Payment for implementing, administering, and providing all equipment and personnel to perform the CSEP shall be included in the bid items for which the CSEP is required.
- P. The completed work shall include all necessary permanent safety devices such as machinery guards and similar ordinary safety items required by the State and Federal (OSHA) Industrial Safety Authorities and applicable local and national codes. Further, any features of the work subject to such safety regulations shall be fabricated, furnished, and installed in compliance with these requirements. The Contractor shall notify all manufacturers, equipment suppliers, and subcontractors of the provisions of this article. All chemicals and wetted components supplied as part of this Project shall comply with NSF 60 and NSF 61 requirements, respectively.
- Q. In selecting and/or approving equipment for installation in the project, the Owner and Engineer assume no responsibility for injury or claims resulting from failure of the equipment to comply with applicable federal, state, and local safety codes or requirements, or the safety requirements of a recognized agency, or failure due to faulty design concepts, or defective workmanship and materials.

SC-7.16 Delete Paragraph 7.16.A.1.a in its entirety and insert the following in its place:

- a. no hardcopies shall be submitted, except as noted on the submittal checklist.

SC-7.16 Add the following language immediately after Paragraph 7.16.A.1.a:

The Engineer will furnish the Contractor with a list of the required shop drawings on the SHOP DRAWING AND EQUIPMENT INFORMATION CHECKLIST along with the Notice to Proceed. Project submittals, transmittals, and RFIs will be processed using the Virtual Project Manager™ (VPM) website. The Engineer will set up the Project and usernames for all users. The Contractor is to provide names, titles, and email addresses for all users to be granted access. The Contractor is required to mark each submittal or shop drawing with the designated submittal number. Submittals not marked with the appropriate designated submittal number will be rejected. The Contractor shall submit a signed American Iron and Steel (AIS) Certification Letter for any item subject to AIS requirements from the manufacturer per the Implementation of AIS provisions and De Minimis Waiver memorandums in Attachment B. Submittals subject to AIS requirements will not be approved by Engineer without a signed AIS Certification Letter. The Contractor shall maintain a current log of all items on the De Minimis list for the Project and a current electronic copy shall be provided with each Pay Request or when requested by the Engineer. The AIS Certification Letter shall be submitted to the Engineer with the shop drawing submittals for AIS products prior to Engineer approving submittal. The Contractor shall not install nor be paid for Materials on Hand for products not adhering to the AIS requirements.

The Contractor shall submit and process shop drawings electronically using the VPM website. The Engineer will enter the list of submittals on the website. The Contractor will log in and upload submittals under the appropriate submittal number for review. The Engineer will change the submittal status to under review, indicating that the submittal has been received. The Engineer marks the submittal as NO EXCEPTIONS TAKEN, SUPPLY AS NOTED, AMEND AND RESUBMIT, or REJECTED after review. VPM automatically sends an email to all parties selected by the Engineer to receive notifications when a submittal's status changes. The Contractor shall then take the appropriate action when responding to the marked-up submittal including resubmission as required until the submittal has been accepted by the Engineer.

AMERICAN IRON AND STEEL (AIS) REQUIREMENTS

Definitions

“Iron and steel products” are defined as the following products made primarily of iron or 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.

“Steel” means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements. Only items on the above list made primarily of iron or steel, permanently incorporated into the project must be produced in the United States. For example, trench boxes, scaffolding, or equipment, which are removed from the project site upon completion of the project, are not required to be made of United States Iron or Steel.

“**Primarily iron or steel**” is defined as a product made of greater than 50 percent iron or steel, measured by cost. The cost should be based on the material costs. If a product is determined to be less than 50 percent iron and steel, the AIS requirements do not apply. An exception to this definition is reinforced precast concrete products in which the reinforcing bar and wire must be produced in the United States even if their cost is less than 50 percent of the total material cost. Additionally, the casting of the concrete product must take place in the United States.

“**Construction materials**” are those articles, materials, or supplies made primarily of iron and steel that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment, and systems. Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

Compliance Steps

- A. Contractor shall collect Manufacturer’s Certification Letter’s to verify compliance with American Iron and Steel requirements for all products determined to be made primarily of iron and steel. The manufacturer’s certifications shall be submitted to the project Engineer along with the material submittals.
- B. Contractor shall maintain and provide the Engineer upon request a listing of all iron and steel components used in the project, their manufacturers’ names and locations, and keep all certification letters.
- C. The De Minimis Waiver that allows the use of a minor amount of non-domestic incidental iron and steel components applies to this project. Costs for such De Minimis incidental components cumulatively may comprise of no more than a total of 5 percent of the total cost of the materials used in and incorporated into a project; the cost of an individual item may not exceed 1 percent of the total cost of the materials used in and incorporated into a project. The Contractor shall maintain a list of any non-domestically produced products used and their costs to demonstrate that they comply with the required percentages.
- D. Contractor shall submit a completed Prime Contractor’s Certification Letter to the Engineer upon Substantial Completion of the project to certify that all Work and materials have complied with American Iron and Steel Requirements. Refer to the Prime Contractor’s Certification Letter included at the end of Attachment B.

The included memorandums are currently extended until the end of FY 2023.

SC-7.16 Amend Paragraph 7.16.A.1.c by deleting the last period and adding:

including Manufacturer’s Certification letter for any item in the submittal subject to American Iron and Steel requirements and include the Certificate in the submittal. Refer to Manufacturer’s Certification Letter provided in these Contract Documents.

SC-7.16 Add the following new paragraph immediately after Paragraph 7.16.C.8:

9. Engineer's review and approval of Shop Drawings or Sample shall include review of compliance with American Iron and Steel requirements, as applicable.
10. The practice of submitting incomplete or unchecked shop drawings for the Engineer to correct or finish will not be acceptable; and shop drawings which, in the opinion of the Engineer, clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the Contract Documents and will be returned to the Contractor for resubmission in the proper form.
11. After the shop drawings have been reviewed and stamped by the Engineer, it will be uploaded to the VPM site for review and action by the Contractor. If major changes or corrections are necessary, the drawings may be rejected with such changes or corrections indicated; and the Contractor shall correct and resubmit the drawings via VPM unless otherwise directed by the Engineer. No changes shall be made by the Contractor to resubmitted shop drawings other than those changes indicated by the Engineer.
12. Shop drawings which are not approved by deadlines shown on the approved construction schedule shall be reason for the Engineer to retain additional monies to allow for Owner's losses due to untimely completion. All shop drawings shall be submitted in a form suitable for approval at no later than 40 percent of the allowance of time of completion. Failure to meet this deadline may result in additional retention.

SC-7.17 Add the following new paragraph immediately after Paragraph 7.17.E:

- F. The Contractor hereby agrees to make, at his own expense, all repairs or replacements necessitated by defects in materials or workmanship, supplied under terms of this Contract, which become evident within one year after the date of Substantial Completion. This expense shall include, but is not limited to, costs for engineering and the resident project representative to ensure materials and workmanship are in adherence with the Contract Documents as described in SGC 14.03 and 14.04. The Contractor further assumes responsibility, at his own expense, for a similar one-year warranty for all work and materials provided by Subcontractors or manufacturers of packaged equipment components. The effective date for the start of the warranty period for equipment and other items that are placed into service prior to final acceptance shall be the date of Substantial Completion for that specific item. The Contractor shall also warranty his work against trench settlement for a period of one year after the date of Substantial Completion. Refer to SGC 15.03 Substantial Completion.
- G. The Contractor shall also maintain erosion control measures on any new cut or fill slopes or other disturbed areas during the one-year guarantee period following date of acceptance by the Owner and shall repair any fill slope instability (slip out) or erosion damage (greater than 2 inches in depth). In the event of a fill instability (slip out) that the Contractor believes was properly installed, the Contractor may request the Engineer to take subsequent compaction tests on adjacent undisturbed fill. If these tests show that compaction density and other provisions of the Specifications had been complied with, then the Contractor shall be compensated for any repair expense as an extra work item. However, if the Contractor requests such subsequent compaction testing, then it will be at the Contractor's expense, unless such tests validate that the fill had initially been properly installed.
- H. The Contractor shall make all repairs and replacements promptly upon receipt of written order for same from the Owner. If the Contractor fails to make the repairs and replacements promptly, the Owner may do the work, and the Contractor and his Surety shall be liable for the cost thereof.

- I. The Contractor is hereby made aware that extended warranties may apply to some specified equipment.

ARTICLE 8—OTHER WORK AT THE SITE

No suggested Supplementary Conditions in this Article.

ARTICLE 9—OWNER’S RESPONSIBILITIES

SC-9.01 Add the following paragraph immediately after Paragraph 9.01.A:

- B. The Engineer will have authority to issue directives to the Contractor to make changes or additions to the work when in the Engineer's opinion it is obvious that delay in making the directive will undoubtedly cost the Owner additional extra work expense or that project completion will be significantly jeopardized. The Engineer will always attempt to secure the Owner's approval prior to the issuance of such directives. Such directives will only be made to achieve originally conceived project goals and not be used for extra nonessential items, except where the Engineer has a written approval of that item from the Owner. Where practical, the Engineer will always attempt to obtain a fair lump sum cost or basis of cost from the Contractor prior to proceeding with the work. In those cases where a directive must be given without an agreed cost, the work shall proceed and the cost of the work shall be determined pursuant to SGC 11.02. A Contract Change Order to validate any directive shall be prepared by the Engineer at the earliest practical date.

ARTICLE 10—ENGINEER’S STATUS DURING CONSTRUCTION

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).
 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

SC-11.03 Add the following new paragraphs immediately after Paragraph 11.03.B.2:

3. The Contractor shall submit a daily report to the Engineer on forms approved by the Owner. Included are applicable delivery tickets, listing all labor, materials, and equipment involved for that

day, and other services and expenditures when authorized. Failure to submit the daily report by the close of the next working day waives any rights for that day. An attempt shall be made to reconcile the report daily, and it shall be signed by the Engineer and the Contractor. In the event of disagreement, pertinent notes shall be entered by each party to explain points, which cannot be resolved immediately. Each party shall retain a signed copy of the report. Reports by Subcontractors or others shall be submitted through the Contractor.

The report shall:

- a. Show names of workers, classifications, and hours worked.
- b. Describe and list quantities of materials used.
- c. Show type of equipment, size, identification number, and hours of operation, including loading and transportation, if applicable.
- d. Describe other services and expenditures in such detail as the Agency may require.

SC-11.05 Add the following at the end of Paragraph 11.05.B:

For Owner-authorized changes in the Work, Contractor will provide the Manufacturer's Certification for any materials subject to American Iron and Steel requirements.

SC-11.09 Add the following new paragraph immediately after Paragraph 11.09.B.2.b:

- c. Change Orders involving materials subject to American Iron and Steel requirements shall include supporting data (name of manufacturer, city and state where the product was manufactured, description of product, signature of authorized manufacturer's representative) in the Manufacturer's Certification Letter, as applicable.

ARTICLE 12—CLAIMS

SC-12.01 Add the following new paragraph immediately after Paragraph 12.01.G:

- H. 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. Contractor 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.
- I. *Release of Claims:* In accordance with State of California Public Contract Code 7100, final payment of undisputed contract amounts is contingent upon the Contractor furnishing a release to the Owner and the Engineer as agent of the Owner from all claims and all liability to the Contractor for all things done or furnished in connection with the undisputed work and every act of the Owner and others relating to or arising out of the work. A form is attached which is to be submitted for this purpose. Disputed contract claims in stated amounts may be specifically excluded by the Contractor from the operation of the release. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from obligations under this Contract and the Performance Bond, Payment Bond, and other bonds and warranties as herein provided.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.02 Modify Paragraph 13.02.C by adding the following at the end of the paragraph:

, subject to approval by Agency.

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 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.
 - c. Should any contract item be deleted in its entirety, payment will be made only for actual costs incurred prior to notification of such deletion.
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

SC-14.02 Add the following language after Paragraph 14.02.A:

The Work is subject to inspection and approval by the Engineer. Work shall be done only in the presence of the Engineer, unless otherwise authorized. Any work done without proper inspection will be subject to rejection. The Engineer and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the project site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with these specifications. Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

SC-14.03 Add the following new paragraph immediately after 14.03.F:

- G. Installation of materials that are non-compliant with American Iron and Steel requirements shall be considered defective work.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.01 Add the following language at the end of Paragraph 15.01.A:

Measurement of actual quantities installed (for example, lineal feet of pipe) shall be jointly performed by a representative of the Contractor and the Engineer at the end of each working day.

SC-15.01 Add the following language at the end of Paragraph 15.01.B.2:

The Contractor shall be responsible for damage or loss of all job site materials, regardless of payment, until final project acceptance.

SC-15.01 Add the following new paragraphs after Paragraph 15.01.B.4:

5. The prices bid in the Proposal shall be full compensation to the Contractor for furnishing all labor, equipment, supplies, materials (including taxes), tools, transportation, supervision, testing, overhead, profit, and any other related cost items necessary to perform all the work required in these Contract Documents. Items of work required herein but not specifically listed in the Proposal shall be deemed within the scope of work of the most applicable item in the Proposal. Specific limits of work, delineated on the Drawings as, "Payment Limit" lines, may be established on the Drawings and/or described in the technical specifications for some of the work items.
6. The Application for Payment Form to be used on this Project is EJCDC No. C-620. The Agency must approve all Applications for Payment before payment is made.
7. By submitting materials for payment, Contractor is certifying that the submitted materials are compliant with American Iron and Steel requirements. Manufacturer's Certification letter for materials satisfy this requirement. Refer to Manufacturer's Certification Letter provided in these Contract Documents.
8. Progress payments (except for the final pay estimate) will not be made unless the value of the work results in an amount due of more than \$5,000.
9. Pipeline units in the Bid Proposal and/or Schedule of Values shall be paid as follows:

Item and Work Status	Value of Work (% of Bid Price)
Pipes including Trench Excavation and Backfill:	
a. Installed and Backfilled to Grade	80
b. Testing	10
c. Surface Restoration	10

SC-15.01 Add the following new paragraph after Paragraph 15.01.C.2.c:

- d. The materials presented for payment comply with American Iron and Steel requirements.

SC-15.01 Add the following new paragraph after Paragraph 15.01.C.3.b:

- c. Defective work or improper materials have been accepted.

SC-15.01 Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

2. The Application for Payment with Engineer's recommendation will be presented to the Owner and Agency for consideration. If both the Owner and Agency find the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due thirty (30) days after the Application for Payment is presented to the Owner, and the Owner will make payment to the Contractor.

SC-15.02 Amend Paragraph 15.02.A by striking out "7 days after."

SC-15.03 Modify 15.03.A by adding the following after the last sentence:

Contractor shall also submit the General (Prime) Contractor's Certification of Compliance certifying that to the best of the Contractor's knowledge and belief all substitutes, equals, and all iron and steel products proposed in the shop drawings, Change Orders, and Partial Payment Estimates, and those

installed for the Project, are either produced in the United States or are subject to an approved waiver as mandated by EPA's State Revolving Funds.

after the first sentence of Paragraph 15.03.B:

In all cases, work will not be considered substantially complete until all testing and functional acceptance tests have been completed and accepted by the Engineer.

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.

SC-15.03 Delete Paragraph 15.03.D in its entirety and insert the following in its place:

- D. The Contractor shall maintain all insurance required by the contract for all work, regardless of the status of completion, until all work for the entire project is complete as established by the Engineer's written recommendation of final payment. Unless Owner and Contractor agree otherwise in writing, the Contractor shall bear responsibility for security, operation, protection of work, insurance, maintenance, and utilities until all work is complete.

SC-15.04 Add the following new paragraph after Paragraph 15.04.A.4:

5. Partial use or occupancy shall not constitute an acceptance of such portions of the work.

SC-15.06 Delete the last sentence of Paragraph 15.06.E in its entirety and insert the following in its place:

Thirty-five days after the filing of a Notice of Completion with the County Recorder and after presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is owed.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

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.

ARTICLE 18–MISCELLANEOUS

No suggested Supplementary Conditions in this Article.

SC-19 Add the following new Article:

ARTICLE 19–FEDERAL REQUIREMENTS

SC-19.01 Agency Not a Party

This Contract is expected to be funded in part with funds provided by Agency. Neither Agency nor any of its departments, entities, or employees is a party to this Contract.

SC-19.02 Conflict of Interest

- A. Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the drawings and specifications has a corporate or financial affiliation with the supplier or manufacturer. Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest in or other interest in or a tangible personal benefit from the Contractor. Owner's officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.

SC-19.03 Gratuities

- A. If Owner finds after a notice and hearing that Contractor, or any of Contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of Owner or Agency in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, Owner may, by written notice to Contractor, terminate this Contract. Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which Owner bases such findings shall be an issue and may reviewed in proceedings under the dispute resolution provisions of this Contract.
- B. In the event this Contract is terminated as provided in paragraph 19.04.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of this Contract by Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, Owner may pursue exemplary damages in an amount (as determined by Owner) which shall not be less than three nor more than ten times the costs Contractor incurs in providing any such gratuities to any such officer or employee.

SC-19.04 Audit and Access to Records

- A. Owner, SWRCB, the Comptroller General of the United States, or any of their duly authorized representatives shall have access to any books, documents, papers, and records of the Engineer which are pertinent to the Agreement, for the purpose of making audits, examinations, excerpts, and transcriptions. Engineer shall maintain all required records for three years after final payment is made and all other pending matters are closed.

SC-19.05 Small, Minority, and Women's Businesses

- A. If Contractor intends to have any subcontracts for a portion of the work, Contractor must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used whenever possible. Affirmative steps must include:
1. Placing qualified small and minority businesses and women's enterprises on solicitation lists;
 2. Assuring that small and minority businesses; and women's business enterprises are solicited whenever they are potential sources;
 3. Dividing total requirements when economically feasible, into small tasks or quantities to permit maximum participation by small, minority, and women's businesses;
 4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;
 5. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

SC-19.06 Anti-Kickback

- A. Contractor shall comply with the Copeland Anti-Kickback Act (40 U.S.C. 3145) as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans and Grants from the United States"). The Act provides that Contractor or subcontractor must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. Owner shall report all suspected or reported violations to Agency.

SC-19.07 Clean Air and Pollution Control Acts

- A. If this Contract exceeds \$100,000, Compliance with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h) and 42 U.S.C. 7401 et. seq.), section 508 of the Clean Water Act (33 U.S.C. 1368) and Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR part 15) is required. Contractor will report violations to SWRCB and the Regional Office of the EPA.

SC-19.08 State Energy Policy

- A. Contractor shall comply with the Energy Policy and Conservation Act (P.L. 94-163). Mandatory standards and policies relating to energy efficiency, contained in any applicable State Energy Conservation Plan, shall be utilized.

SC-19.09 Equal Opportunity Requirements

- A. If this Contract exceeds \$10,000, Contractor shall comply with Executive Order 11246, "Equal Employment Opportunity," as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and as supplemented by regulations at 41 CFR Part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."
- B. Contractor's compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographical area where the Contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout

the length of the Contract, and in each trade, and Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees from Contractor to Contractor or from project to project for the sole purpose of meeting Contractor's goals shall be a violation of the Contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

- C. Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the Contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the Contract is to be performed.

SC-19.10 Restrictions on Lobbying

- A. Contractor and each subcontractor shall comply with Restrictions on Lobbying (Public Law 101-121, Section 319) as supplemented by applicable Agency regulations. This Law applies to the recipients of contracts and subcontracts that exceed \$100,000 at any tier under a Federal loan that exceeds \$150,000 or a Federal grant that exceeds \$100,000. If applicable, Contractor must complete a certification form on lobbying activities related to a specific Federal loan or grant that is a funding source for this Contract. 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, 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 disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Certifications and disclosures are forwarded from tier to tier up to the Owner. Necessary certification and disclosure forms shall be provided by Owner.

SC-19.11 Environmental Requirements

- A. *Wetlands* - When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
- B. *Floodplains* - When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100-year floodplain areas delineated on the latest Federal Emergency Management Agency Floodplain maps, or other appropriate maps, i.e., alluvial soils on NRCS Soil Survey maps.
- C. *Historic Preservation* - Any excavation by Contractor that uncovers an historical or archaeological artifact shall be immediately reported to Owner and a representative of SWRCB. Construction shall be temporarily halted pending the notification process and further direction issued by SWRCB after consultation with the State Historic Preservation Officer (SHPO).
- D. *Endangered Species* - Contractor shall comply with the Endangered Species Act, which provides for protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of SWRCB. Construction shall be temporarily halted pending notification process and further directions issued by SWRCB after consultation with the U.S. Fish and Wildlife Service.

E. *Mitigation Measures* - If the project had an Environmental Report, Environmental Assessment, or Environmental Impact Statement, compliance with the mitigation measures, if any, in that document are hereby included as a condition of this contract.

1. Dust Control

- a. Apply nontoxic soil stabilizers according to manufacturers' specification to all graded and/or trenched areas that sit inactive for ten days or more.
- b. Reestablish ground cover on previously vegetated areas disturbed by project-related activities through seeding, revegetating, and watering as appropriate.
- c. Suspend trenching and/or grading activities when winds (as instantaneous gusts) exceed 15 miles per hour or when winds create construction-induced visible dust plumes moving beyond the project site, in spite of dust control measures.
- d. Provide temporary traffic control as appropriate during all phases of construction to improve traffic flow.
- e. Water active construction sites as appropriate to reduce dust.
- f. All trucks hauling dirt, sand, soil, or other loose materials should be covered or maintain at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the trailer).
- g. Sweep streets at the end of the day if visible soil materials are carried onto adjacent public paved roads (recommend water sweeper with reclaimed water).

2. Bird Nesting Survey

If proposed site disturbance and construction activities are planned to occur within the project area during the nesting season for local avian species (typically February 1 through August 31), the Contractor shall retain qualified personnel to conduct a focused survey for active nests of special-status birds within and in the vicinity of (up to 200 feet and no less than 100 feet outside project boundaries, where possible) the disturbance and construction area no more than 30 days prior to ground disturbance or tree removal. If active nests are found, trees/shrubs with nesting birds shall not be disturbed until abandoned by the birds or qualified personnel deem disturbance potential to be minimal (in consultation with the USFWS and/or CDFG, where appropriate). Tree removal shall be restricted to a period following fledging of chicks, which typically occurs between late July and early August.

If an active nest is located within the 100 feet (200 feet for raptors) of construction activities, other restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 100 feet or 200 feet, as appropriate, around the nest as confirmed by the appropriate resource agency) or alteration of the construction schedule.

If construction activities or tree removal are proposed to occur during the non-breeding season (September 1 through January 31), a survey is not required, no further studies are necessary, and no mitigation is required.

3. Cultural Resources

If, during the course of project implementation, cultural resources (i.e., prehistoric sites, historic features, isolated artifacts, and features such as concentrations of shell or glass) are discovered, work shall be halted immediately within 50 feet of the discovery, the Owner shall be immediately notified, and a professional archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to determine

the significance of the discovery. The Owner shall consider mitigation recommendations presented by a professional archaeologist and implement a measure or measures that the Owner deems feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures.

If, during the course of project implementation, paleontological resources (e.g., fossils) are discovered, work shall be halted immediately within 50 feet of the discovery, the Owner shall be immediately notified, and a qualified paleontologist shall be retained to determine the significance of the discovery. The Owner shall consider the mitigation recommendations presented by a professional paleontologist and implement a measure or measures that the Owner deems feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures.

If, during the course of project implementation, human remains are discovered, all work shall be halted immediately within 50 feet of the discovery, the Owner shall be immediately notified, and the County Coroner must be notified, according to Section 5097.98 of the California Public Resources Code and Section 7050.5 of the California Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, and the procedures outlined in California Code of Regulations Section 15064.5(d) and (e) shall be followed.

4. Traffic Control

The Contractor shall prepare a traffic control plan prior to construction. One-way traffic or one available traffic lane shall be maintained during construction activities when possible and driveway access shall be available to properties adjoining the work site. If road closures are necessary in order to complete portions of the proposed project, the Contractor shall coordinate with the Owner to notify at least 24 hours prior to closures area residents and other departments, including emergency service providers and public transit operators, to identify alternate routes. If a full closure of a street is determined to be necessary, the closure shall not last longer than 4 hours and signage or personnel shall be available to route traffic to other available rout-choice options. The traffic control plan shall ensure access to fire and police stations at all times during construction.

5. Noise

The Contractor shall provide documentation to the Owner that all construction equipment is regularly maintained. Additionally, all equipment utilized for construction of all phases of the project shall include the following noise reduction devices:

- a. All vehicles and engines shall be equipped with the appropriate manufacturer's noise reduction device(s), including, but not limited to, a manufacturer's muffler (or equivalently rated material) that is free of rust, holes, and exhaust leaks.
- b. All engine housing doors shall be kept closed and noise-insulating material shall be mounted on the engine housing to reduce noise, to the extent practical without interfering with the manufacturer's guidelines for engine operation or exhaust.
- c. Portable compressors, generators, pumps, and other such devices shall be covered with noise-insulating fabric to the extent practical without interfering with the manufacturer's guidelines for engine operation or exhaust, and shall further reduce noise by operating such devices at lower engine speeds during work to the maximum extent possible.

- d. Construction equipment not actively being utilized shall be turned off.
- e. Vehicle idling on-site shall be limited to 5 minutes.
- f. Reduced volume back-up alarms shall be used for all construction vehicles when practicable.

SC-20 Add the following new Article:

ARTICLE 20—PROJECT SIGN

SC-20.01 Construction Project Sign

- A. Contractor will place a temporary construction project sign at a location designated by the Engineer. This sign measuring 4' x 8', will be made of 3/4" exterior grade plywood and adhere to the format and details described below. The sign will be prepared by a professional sign maker. The proposed project sign shall be submitted to the Engineer for approval prior to ordering.

The Project Sign shall state the name of the Owner, the Project Title, the Engineer, the Contractor, and include the following language:

"Funding for this Lewiston Community Services District (LCSD) Well 8 Project has been provided in full or in part by the State of California Natural Resources Agency Department of Parks and Recreation per Capita Grant Program, the Budget Act of 2021, and the Drinking Water State Revolving Fund, which may include capitalization funding from the United States Environmental Protection Agency through an agreement with the State Water Resources Control Board."

The Project Sign shall clearly display the following logos:

- LCSD Logo
- PACE Engineering, Inc. Logo
- Drinking Water State Revolving Fund Logo
- State Water Resources Control Board Logo
- Parks and Water Bond Act Logo

These logos are available at the State Water Resources Control Board website:

http://www.waterboards.ca.gov/drinking_water/services/funding/dwsrf_templates.html

Each edge of logo shall be a minimum of 24 inches by 24 inches. The Project Sign shall list the names of the current officials:

- Governor: Gavin Newsom
- Secretary for Natural Resources: Wade Crowfoot
- California Department of Parks and Recreation Director: Armando Quintero

SC-21 Add the following new Article:

ARTICLE 21–CALIFORNIA STATE REQUIREMENTS

SC-21.01 Registration with the California Department of Industrial Relations

- A. 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.

SC-21.02 Antitrust Claim Settlement

- A. 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.

SC-21.03 Utilities

- A. Contractor shall be responsible for marking all excavations and notifying Underground Service Alert (USA) at least 2 working days 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 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.

SC-21.04 Examination and Audit

- A. Notwithstanding any other provision of law, every contract involving the expenditure of public funds in excess of Ten thousand dollars (\$10,000) entered into by any state agency, board, commission, or department or by any other public entity, including a city, county, or district, shall be subject to the examination and audit of State auditor, at the request of the public entity or as part of any audit of the public entity, for a period of three (3) years after final payment under the contract.

RELEASE OF CLAIMS

PROJECT: WELL 8 PROJECT

OWNER: LEWISTON COMMUNITY SERVICES DISTRICT

ENGINEER: PACE ENGINEERING, INC.

CONTRACTOR:

The acceptance by the Contractor of the final payment for work shall release the Owner and the Engineer as agent of the Owner from all claims and all liability to the Contractor for all things done or furnished in connection with the work and every act of the Owner and others relating to or arising out of the work, except for previously disputed work. Disputed work will only be considered for possible future payment if it has been properly brought to the Engineer's attention and processed pursuant to SGC 5.04 Differing Subsurface or Physical Conditions and SGC 12.01 Claims. The Contractor agrees there are no other claims that will be made, except those properly processed pursuant to these Standard General Conditions. Previously disputed contract claims in stated amounts (if properly processed as disputed work) are specifically excluded by the Contractor from the operation of this release. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from obligations under this Contract and the Performance Bond, Labor and Materials Bond, and other bonds and warranties as herein provided.

Printed Name of Contractor's Representative
with Authority to Act for Contractor

Signature

Date

WORK CHANGE DIRECTIVE NO.: [Number of Work Change Directive]

Owner: Lewiston Community Services District Owner's Project No.:
Engineer: PACE Engineering, Inc. Engineer's Project No.: 2399.08
Contractor: Contractor's Project No.:
Project: Well 8 Project
Contract Name: Well 8 Project
Date Issued: Effective Date of Work Change Directive:

Contractor is directed to proceed promptly with the following change(s):

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

Notes to User—Check one or both of the following

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:

CHANGE ORDER NO.: [Number of Change Order]

Owner: Lewiston Community Services District Owner's Project No.:
 Engineer: PACE Engineering, Inc. Engineer's Project No.: 2399.08
 Contractor: Contractor's Project No.:
 Project: Well 8 Project
 Contract Name: Well 8 Project
 Date Issued: 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:

ACCEPTED:

ACCEPTED:

By: _____ By: _____ By: _____
 Engineer (if required) Owner (Authorized Signature) Contractor (Authorized Signature)

Title: _____ Title: _____ Title: _____

Date: _____ Date: _____ Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date: _____

Title: _____

**ENGINEER'S SUPPLEMENTARY CONDITIONS
TABLE OF CONTENTS**

1.	REFERENCE SPECIFICATIONS.....	1
2.	SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES.....	1
3.	FORMAT OF TECHNICAL SPECIFICATIONS.....	2
4.	PERMITS	2
5.	BEST MANAGEMENT PRACTICES AND EROSION CONTROL.....	2
6.	MAJOR PUBLIC UTILITIES SERVING THE AREA OF WORK	4
7.	ACCESS BY FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS.....	4
8.	EQUIPMENT MAINTENANCE DURING CONSTRUCTION	4
9.	PRE-STARTUP CHECKOUT	4
10.	WATER, SANITATION, POWER, AND TELEPHONE	5
11.	EQUIPMENT INFORMATION	5
12.	FUNCTIONAL TESTING.....	6
13.	SALVAGE OF MATERIALS AND EQUIPMENT	6
14.	FIRE PREVENTION	7

ENGINEER'S SUPPLEMENTARY CONDITIONS

These Engineer's Supplementary Conditions (ESC) supplement the Instructions to Bidders, Standard General Conditions (SGC) of the Construction Contract (EJCDC C-700, 2018 Edition), Supplementary Conditions (SC), and other provisions of the Contract Documents as indicated below. Where the terms General Conditions are used, it is understood to reference the Standard General Conditions.

The terms used in these ESCs will have the meanings indicated in the General Conditions. Additional terms used in these ESCs have the meanings indicated below, which are applicable to both the singular and plural thereof.

1. REFERENCE SPECIFICATIONS

Where other reference specifications such as those of ASTM, AASHTO, etc., have been referred to, the applicable portion of such specifications shall become a part of these Contract Documents.

The document hereinafter referred to as the "Standard Specifications," or simply as "SS," is the separately bound 2018 Edition of Standard Specifications for Public Works Construction commonly called the "Greenbook."

The words "State Specifications" when used in these Specifications shall mean the Standard Specifications of the State of California, Department of Transportation (Caltrans) 2018 Edition, as amended.

2. SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES

The Contractor shall plan and carry out the construction work with a minimum of interference to the delivery of water to the existing water system. Prior to starting construction, the Contractor shall confer with the Engineer and Owner's operations representative to develop an approved construction schedule, which will permit water delivery to function as normally as practical during the construction period. It will be necessary to do certain parts of the construction work outside normal working hours in order to avoid undesirable conditions, and it shall be the obligation of the Contractor to do this work at such times at no additional cost to the Owner.

The Engineer may require the Contractor and applicable subcontractors to attend and participate in project progress meetings at the job site to coordinate the sequence of work and interruption of existing facilities, payment applications, contract change orders and/or other contract related issues at no additional cost to the Owner.

The Contractor shall include the following constraints when bidding this project:

The Contractor shall notify the Owner and Engineer at least two weeks prior to performing any interties between the new water main and any existing water system components.

Regardless of what procedure is agreed upon, the Contractor shall be responsible for any damage to existing improvements from the Contractor's operations and shall take all appropriate precautions to minimize utility interruptions. Coordination efforts and sequence of work issues will be the responsibility of the Contractor at no additional cost to the Owner.

The Contractor is responsible for coordinating all installation and final design of electrical utility with Trinity Public Utilities District prior to start up of the new Well 8. Refer to Attachment D of the Project Manual for Trinity Public Utilities District's Preliminary Design.

3. FORMAT OF TECHNICAL SPECIFICATIONS

Technical specifications are written in an abbreviated outline form.

A reference to any other specification(s) means that the Contractor shall perform the work in conformance with that specification. Statements of work such as excavate, install, provide, furnish, test, etc., without particular reference to who is doing the work shall be understood to be the Contractor. Simple reference of materials and/or equipment means the Contractor shall furnish these materials and/or equipment or an approved equivalent. In the absence of any statement regarding application or installation of materials or equipment, such item shall be installed or applied in accordance with the manufacturer's or supplier's instructions; or in the absence of such instructions, it shall be installed or applied pursuant to standard construction practice as approved by the Engineer.

4. PERMITS

The Contractor shall pay for, obtain, and comply with all additional permits and all associated fees required for construction including, but not limited to, the following:

1. State Division of Occupational Safety and Health permits related to working in trenches and excavations.
2. Trinity County Encroachment Permit.
3. Trinity County Decomposed Granite Permit.

Owner-obtained permits will be made available for review during the Bid period. Contractor shall obtain and review copies, if not otherwise attached herein, of Owner-obtained permits from Owner, and comply with the conditions set forth therein.

5. BEST MANAGEMENT PRACTICES AND EROSION CONTROL

A Storm Water Pollution Prevention Plan is not required because the area of disturbance is estimated to be less than one acre. However, before beginning work, the Contractor shall submit an erosion control plan (ECP) for review by the Engineer. The ECP shall utilize best management practice (BMP) guidelines set forth in Section 3 – Erosion and Sediment Control BMPs of the *Storm Water Management Practices Handbook Portal: Construction*.

The Contractor shall address, at a minimum, the following items:

1. Layout, location, and schedule of implementation for erosion control facilities.
 - a. Minimize ground disturbance activities to those areas immediately planned for construction.
 - b. Identification and use of best management practices.
 - c. All exposed stockpiles shall be covered, watered, or treated with soil stabilization material as necessary to prevent wind erosion.
 - d. During wet weather periods, stockpiles shall be covered or sediment traps built around the stockpile to prevent erosion into off-site water courses or storm drains.
 - e. All hazardous materials shall be stored in covered facilities and in properly labeled containers. Any spills shall be immediately cleaned up.
 - f. All equipment shall be properly maintained to prevent leakage of oil, fuel, or other fluids. Drip pans shall be used under leaking equipment that is stationary or idle.
 - g. Contractor shall obtain approval of all permits and Drawings prior to commencing construction activities. The area of potential disturbance has been determined to be less than one acre and is therefore exempt from obtaining a Storm Water Pollution Prevention Plan (SWPPP). If the Contractor causes the disturbed area to increase to greater than or equal to one (1) acre through his means and methods, then he shall prepare and implement a SWPPP at no extra cost to Owner.
2. Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect work and existing facilities from flooding throughout construction period.
3. Design erosion and sediment controls to handle peak runoff resulting from 25-year, 24-hour storm event based on U.S. Weather Bureau, "Rainfall-Frequency Atlas of the United States for Durations from 30 minutes to 24 hours and Return Periods from 1 to 100 Years," Technical Paper No. 40, 1981.
4. During wet weather periods, no cleaning or grading shall occur in excess of that which can be surfaced stabilized at the end of each workday or which otherwise endanger the public health and safety or is otherwise prohibited by state and federal regulations.
5. During wet weather periods, October 15 to May 15, all erosion control measures shall be in place unless otherwise directed by the Engineer.

6. MAJOR PUBLIC UTILITIES SERVING THE AREA OF WORK

Following is a list of the major public utilities serving the area. The list indicates the name and telephone number of the various utilities that are known to have facilities near the project. The Contractor shall notify USA (811) for subsurface utility locations at least two working days, not including date of notification, prior to commencing excavations for this project.

<u>Name</u>	<u>Telephone No.</u>
Lewiston Community Services District	530-778-0306
Trinity County Public Utilities District	530-623-5536
Trinity County Department of Transportation	530-623-1365 x3414

7. ACCESS BY FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS

Authorized representatives of the State Water Resources Control Board or other health agencies and local government officials shall at all times have access to the work wherever it is in preparation or progress, and the Contractor shall provide proper facilities for such inspection access.

8. EQUIPMENT MAINTENANCE DURING CONSTRUCTION

All equipment and appurtenances installed shall be provided with proper oil and lubricants by the Contractor before being placed in operation. All new equipment shall be maintained and operated by the Contractor until the work is accepted by the Owner or placed into beneficial use by the Owner.

9. PRE-STARTUP CHECKOUT

Upon completion of erection and construction of the facilities, the Contractor shall conduct a pre-startup inspection and checkout of all equipment and devices. Unless the Contractor is thoroughly familiar with the operation of the installed equipment, it shall make provision to have a qualified factory representative on-site to assist in startup and adjustment. The interior of piping, pumps, and other equipment shall be cleaned and made free of foreign material. Equipment shall be lubricated in accordance with the manufacturer's instructions. To the extent practicable, rotating equipment shall be turned, valves and gates shall be operated, and other equipment shall be operated by hand to check for binding, interference, etc. Incoming electric power shall be checked for voltage amplitude and voltage balance. Electric motor-driven equipment shall be checked for correct rotation. All safety guards shall be in place.

The pre-startup checkout is in addition to requirements in other parts of the Specifications.

After the pre-startup checkout has been completed to the satisfaction of the Engineer, the Contractor shall start up and operate individual sub-systems, pieces of equipment, instruments, etc. Debugging, tune-up, and adjustments shall be done as necessary. Functional testing as may be required in the technical specifications shall occur following the pre-startup checkout.

10. WATER, SANITATION, POWER, AND TELEPHONE

Commercial power, sanitation, and telephone are not available to the Contractor at the construction site. The Contractor shall make the arrangements and pay all costs to provide temporary utilities. Water is available to the Contractor at no charge provided that it is used judiciously and provides all means of conveyance as required. The Owner will designate fire hydrants from which the Contractor can obtain water through an Owner-provided hydrant meter.

11. EQUIPMENT INFORMATION

The Engineer will provide a list of required equipment information which will be check marked on the SHOP DRAWING AND EQUIPMENT INFORMATION CHECKLIST. This checklist will be supplied to the Contractor with the Notice to Proceed and/or through VPM.

Written Equipment Manuals will be prepared by the Contractor from equipment information furnished by the manufacturers and suppliers of the installed equipment and materials. It is the intent of this provision that reviewed and approved equipment manuals be supplied to the Owner prior to personnel training and facility start-up.

For each piece of electrical, mechanical, plumbing, and process equipment and materials installed on the project, the Contractor shall compile one electronic and two paper copies of the following information:

1. Descriptive literature (catalog cuts and data sheets with specific model numbers pointed out).
2. Parts lists.
3. Installation Manuals.
4. Operation Manuals.
5. Performance curves (for all pumps, compressors, etc.).
6. Complete as-built electrical diagrams as required in section ELECTRICAL
7. For all equipment suppliers, a list of current names, addresses, emails, and telephone and FAX numbers of those who should be contacted for service information and assistance.
8. Operational Readiness Test (ORT) Calibration Forms (if applicable, refer to Electrical and/or Instrumentation Section).
9. Summary table of required maintenance and lubrication for all new equipment.

The above information is required in addition to that furnished as shop drawings, even though for some equipment the final approved shop drawing submittals and the equipment information may be the same. Original publications are preferred. Clean photocopies will be accepted at the discretion of the Engineer. Faxed or copies of faxed information will not be acceptable.

Each paper copy of this information shall be placed in a high quality, hard-backed binder with Table of Contents and numbered and labeled tabbed dividers separating the information for each of the major pieces of equipment. The Engineer may provide a Table of Contents sequence and the listing of the tabs to be used. If a sample Table of Contents is provided, the Contractor shall organize the above information in the provided sequence. All of the above information shall be provided to the Engineer at least sixty (60) days prior to functional testing of the completed installation.

Upon receipt of the above information from the Contractor, the Engineer will check to see that the information is complete and correct, and the Contractor shall provide any additional information required by the Engineer to complete the Operation and Maintenance Manuals.

12. FUNCTIONAL TESTING

Specific testing of installed equipment and systems will be performed as required in the section specifying the equipment.

In addition to the specific tests, functional testing shall be required. Functional testing is defined as that testing necessary to determine if installed equipment and systems will operate in the manner in which they are intended to operate.

The Contractor shall furnish all labor, materials, tools, equipment, instruments, and services necessary to perform all specific and functional testing of all installed equipment and systems included in his Contract.

During functional testing, the Contractor shall provide for a representative from the equipment supplier, thoroughly familiar with operation of said equipment, to oversee the testing and provide the Owner with suitable training for such equipment, unless the Contractor has this expertise.

Functional testing shall be performed in the presence of the Engineer including manual and automatic modes of operation, shutdowns, alarms, power draw to design point, and shutoff head for pumps, compressors, etc. Refer to Electrical and Instrumentation Sections for additional Functional Acceptance Test (FAT) requirements.

13. SALVAGE OF MATERIALS AND EQUIPMENT

Unless otherwise indicated in the Drawings or Technical Specifications, all materials and equipment which are to be removed from the work, which in the Owner's opinion are valuable, shall remain the property of the Owner, and the Contractor shall carefully remove such materials and/or equipment and give them to the Owner.

14. FIRE PREVENTION

The Contractor shall, at all times, exercise extreme care in public and private lands to prevent forest, grass, building (structures) and brush fires. The Contractor, prior to bidding, shall determine all regulations and rules relating to fire prevention and shall abide by them.

DAVIS BACON WAGE RATES

ATTACHMENT A

**DAVIS BACON WAGE RATES
TO BE ADDED BY ADDENDUM**

AMERICAN IRON AND STEEL PROVISIONS, DE MINIMIS WAIVER,
AND PRIME CONTRACTOR'S CERTIFICATION LETTER

ATTACHMENT B



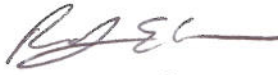
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460


MAR 20 2014

OFFICE OF WATER

MEMORANDUM

SUBJECT: Implementation of American Iron and Steel provisions of P.L. 113-76,
Consolidated Appropriations Act, 2014

FROM: For Andrew D. Sawyers, Director 
Office of Wastewater Management (4201M)

Peter C. Grevatt, Director 
Office of Ground Water and Drinking Water (4601M)

TO: Water Management Division Directors
Regions I - X

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an “American Iron and Steel (AIS)” requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment works if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act), through the end of Federal Fiscal Year 2014.

Section 436 also sets forth certain circumstances under which EPA may waive the AIS requirement. Furthermore, the Act specifically exempts projects where engineering plans and specifications were approved by a State agency prior to January 17, 2014.

The approach described below explains how EPA will implement the AIS requirement. The first section is in the form of questions and answers that address the types of projects that must comply with the AIS requirement, the types of products covered by the AIS requirement, and compliance. The second section is a step-by-step process for requesting waivers and the circumstances under which waivers may be granted.

Implementation

The Act states:

Sec. 436. (a)(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

(2) In this section, the term “iron and steel products” means the following products made primarily of iron or 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.

(b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the “Administrator”) finds that—

(1) applying subsection (a) would be inconsistent with the public interest;

(2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or

(3) inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

(c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.

(d) This section shall be applied in a manner consistent with United States obligations under international agreements.

(e) The Administrator may retain up to 0.25 percent of the funds appropriated in this Act for the Clean and Drinking Water State Revolving Funds for carrying out

the provisions described in subsection (a)(1) for management and oversight of the requirements of this section.

(f) This section does not apply with respect to a project if a State agency approves the engineering plans and specifications for the project, in that agency's capacity to approve such plans and specifications prior to a project requesting bids, prior to the date of the enactment of this Act.

The following questions and answers provide guidance for implementing and complying with the AIS requirements:

Project Coverage

1) What classes of projects are covered by the AIS requirement?

All treatment works projects funded by a CWSRF assistance agreement, and all public water system projects funded by a DWSRF assistance agreement, from the date of enactment through the end of Federal Fiscal Year 2014, are covered. The AIS requirements apply to the entirety of the project, no matter when construction begins or ends. Additionally, the AIS requirements apply to all parts of the project, no matter the source of funding.

2) Does the AIS requirement apply to nonpoint source projects or national estuary projects?

No. Congress did not include an AIS requirement for nonpoint source and national estuary projects unless the project can also be classified as a 'treatment works' as defined by section 212 of the Clean Water Act.

3) Are any projects for the construction, alteration, maintenance, or repair of a public water system or treatment works excluded from the AIS requirement?

Any project, whether a treatment works project or a public water system project, for which engineering plans and specifications were approved by the responsible state agency prior to January 17, 2014, is excluded from the AIS requirements.

4) What if the project does not have approved engineering plans and specifications but has signed an assistance agreement with a CWSRF or DWSRF program prior to January 17, 2014?

The AIS requirements do not apply to any project for which an assistance agreement was signed prior to January 17, 2014.

5) What if the project does not have approved engineering plans and specifications, but bids were advertised prior to January 17, 2014 and an assistance agreement was signed after January 17, 2014?

If the project does not require approved engineering plans and specifications, the bid advertisement date will count in lieu of the approval date for purposes of the exemption in section 436(f).

6) What if the assistance agreement that was signed prior to January 17, 2014, only funded a part of the overall project, where the remainder of the project will be funded later with another SRF loan?

If the original assistance agreement funded any construction of the project, the date of the original assistance agreement counts for purposes of the exemption. If the original assistance agreement was only for planning and design, the date of that assistance agreement will count for purposes of the exemption only if there is a written commitment or expectation on the part of the assistance recipient to fund the remainder of the project with SRF funds.

7) What if the assistance agreement that was signed prior to January 17, 2014, funded the first phase of a multi-phase project, where the remaining phases will be funded by SRF assistance in the future?

In such a case, the phases of the project will be considered a single project if all construction necessary to complete the building or work, regardless of the number of contracts or assistance agreements involved, are closely related in purpose, time and place. However, there are many situations in which major construction activities are clearly undertaken in phases that are distinct in purpose, time, or place. In the case of distinct phases, projects with engineering plans and specifications approval or assistance agreements signed prior to January 17, 2014 would be excluded from AIS requirements while those approved/signed on January 17, 2014, or later would be covered by the AIS requirements.

8) What if a project has split funding from a non-SRF source?

Many States intend to fund projects with “split” funding, from the SRF program and from State or other programs. Based on the Act language in section 436, which requires that American iron and steel products be used in any project for the construction, alteration, maintenance, or repair of a public water system or treatment works receiving SRF funding between and including January 17, 2014 and September 30, 2014, any project that is funded in whole or in part with such funds must comply with the AIS requirement. A “project” consists of all construction necessary to complete the building or work regardless of the number of contracts or assistance agreements involved so long as all contracts and assistance agreements awarded are closely related in purpose, time and place. This precludes the intentional splitting of SRF projects into separate and smaller contracts or assistance agreements to avoid AIS coverage on some portion of a larger

project, particularly where the activities are integrally and proximately related to the whole. However, there are many situations in which major construction activities are clearly undertaken in separate phases that are distinct in purpose, time, or place, in which case, separate contracts or assistance agreement for SRF and State or other funding would carry separate requirements.

9) What about refinancing?

If a project began construction, financed from a non-SRF source, prior to January 17, 2014, but is refinanced through an SRF assistance agreement executed on or after January 17, 2014 and prior to October 1, 2014, AIS requirements will apply to all construction that occurs on or after January 17, 2014, through completion of construction, unless, as is likely, engineering plans and specifications were approved by a responsible state agency prior to January 17, 2014. There is no retroactive application of the AIS requirements where a refinancing occurs for a project that has completed construction prior to January 17, 2014.

10) Do the AIS requirements apply to any other EPA programs, besides the SRF program, such as the Tribal Set-aside grants or grants to the Territories and DC?

No, the AIS requirement only applies to funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12)

Covered Iron and Steel Products

11) What is an iron or steel product?

For purposes of the CWSRF and DWSRF projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the public water system or treatment works:

- Lined or unlined pipes or fittings;
- Manhole Covers;
- Municipal Castings (defined in more detail below);
- Hydrants;
- Tanks;
- Flanges;
- Pipe clamps and restraints;
- Valves;
- Structural steel (defined in more detail below);
- Reinforced precast concrete; and
- Construction materials (defined in more detail below).

12) What does the term ‘primarily iron or steel’ mean?

‘Primarily iron or steel’ places constraints on the list of products above. For one of the listed products to be considered subject to the AIS requirements, it must be made of greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

13) Can you provide an example of how to perform a cost determination?

For example, the iron portion of a fire hydrant would likely be the bonnet, body and shoe, and the cost then would include the pouring and casting to create those components. The other material costs would include non-iron and steel internal workings of the fire hydrant (i.e., stem, coupling, valve, seals, etc). However, the assembly of the internal workings into the hydrant body would not be included in this cost calculation. If one of the listed products is not made primarily of iron or steel, United States (US) provenance is not required. An exception to this definition is reinforced precast concrete, which is addressed in a later question.

14) If a product is composed of more than 50% iron or steel, but is not listed in the above list of items, must the item be produced in the US? Alternatively, must the iron or steel in such a product be produced in the US?

The answer to both question is no. Only items on the above list must be produced in the US. Additionally, the iron or steel in a non-listed item can be sourced from outside the US.

15) What is the definition of steel?

Steel means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel covers carbon steel, alloy steel, stainless steel, tool steel and other specialty steels.

16) What does ‘produced in the United States’ mean?

Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the

material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

17) Are the raw materials used in the production of iron or steel required to come from US sources?

No. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-US sources.

18) If an above listed item is primarily made of iron or steel, but is only at the construction site temporarily, must such an item be produced in the US?

No. Only the above listed products made primarily of iron or steel, permanently incorporated into the project must be produced in the US. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

19) What is the definition of ‘municipal castings’?

Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

- Access Hatches;
- Ballast Screen;
- Benches (Iron or Steel);
- Bollards;
- Cast Bases;
- Cast Iron Hinged Hatches, Square and Rectangular;
- Cast Iron Riser Rings;
- Catch Basin Inlet;
- Cleanout/Monument Boxes;
- Construction Covers and Frames;
- Curb and Corner Guards;
- Curb Openings;
- Detectable Warning Plates;
- Downspout Shoes (Boot, Inlet);
- Drainage Grates, Frames and Curb Inlets;
- Inlets;
- Junction Boxes;
- Lampposts;
- Manhole Covers, Rings and Frames, Risers;

Meter Boxes;
Service Boxes;
Steel Hinged Hatches, Square and Rectangular;
Steel Riser Rings;
Trash receptacles;
Tree Grates;
Tree Guards;
Trench Grates; and
Valve Boxes, Covers and Risers.

20) What is ‘structural steel’?

Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zees. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

21) What is a ‘construction material’ for purposes of the AIS requirement?

Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered “structural steel”. This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

22) What is not considered a ‘construction material’ for purposes of the AIS requirement?

Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials: pumps, motors, gear reducers, drives (including variable frequency drives (VFDs)), electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators), mixers, gates, motorized screens (such as traveling screens), blowers/aeration equipment, compressors, meters, sensors, controls and switches, supervisory control and

data acquisition (SCADA), membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses (including belt presses), conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings (such as electrical boxes/enclosures), lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, analytical instrumentation, and dewatering equipment.

23) If the iron or steel is produced in the US, may other steps in the manufacturing process take place outside of the US, such as assembly?

No. Production in the US of the iron or steel used in a listed product requires that all manufacturing processes must take place in the United States, except metallurgical processes involving refinement of steel additives.

24) What processes must occur in the US to be compliant with the AIS requirement for reinforced precast concrete?

While reinforced precast concrete may not be at least 50% iron or steel, in this particular case, the reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered to be a construction material and must be produced in the US.

Compliance

25) How should an assistance recipient document compliance with the AIS requirement?

In order to ensure compliance with the AIS requirement, specific AIS contract language must be included in each contract, starting with the assistance agreement, all the way down to the purchase agreements. Sample language for assistance agreements and contracts can be found in Appendix 3 and 4.

EPA recommends the use of a step certification process, similar to one used by the Federal Highway Administration. The step certification process is a method to ensure that producers adhere to the AIS requirement and assistance recipients can verify that products comply with the AIS requirement. The process also establishes accountability and better enables States to take enforcement actions against violators.

Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of steel and iron materials. A step certification is a process under which each handler (supplier, fabricator, manufacturer,

processor, etc) of the iron and steel products certifies that their step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. A certification can be quite simple. Typically, it includes the name of the manufacturer, the location of the manufacturing facility where the product or process took place (not its headquarters), a description of the product or item being delivered, and a signature by a manufacturer's responsible party. Attached, as Appendix 5, are sample certifications. These certifications should be collected and maintained by assistance recipients.

Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US. While this type of certification may be acceptable, it may not provide the same degree of assurance. Additional documentation may be needed if the certification is lacking important information. Step certification is the best practice.

26) How should a State ensure assistance recipients are complying with the AIS requirement?

In order to ensure compliance with the AIS requirement, States SRF programs must include specific AIS contract language in the assistance agreement. Sample language for assistance agreements can be found in Appendix 3.

States should also, as a best practice, conduct site visits of projects during construction and review documentation demonstrating proof of compliance which the assistance recipient has gathered.

27) What happens if a State or EPA finds a non-compliant iron and/or steel product permanently incorporated in the project?

If a potentially non-compliant product is identified, the State should notify the assistance recipient of the apparent unauthorized use of the non-domestic component, including a proposed corrective action, and should be given the opportunity to reply. If unauthorized use is confirmed, the State can take one or more of the following actions: request a waiver where appropriate; require the removal of the non-domestic item; or withhold payment for all or part of the project. Only EPA can issue waivers to authorize the use of a non-domestic item. EPA may use remedies available to it under the Clean Water Act, the Safe Drinking Water Act, and 40 CFR part 31 grant regulations, in the event of a violation of a grant term and condition.

It is recommended that the State work collaboratively with EPA to determine the appropriate corrective action, especially in cases where the State is the one who identifies the item in noncompliance or there is a disagreement with the assistance recipient.

If fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1-

888-546-8740 or OIG_Hotline@epa.gov. More information can be found at this website: <http://www.epa.gov/oig/hotline.htm>.

28) How do international trade agreements affect the implementation of the AIS requirements?

The AIS provision applies in a manner consistent with United States obligations under international agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to such agreements. In general, SRF assistance recipients are not signatories to such agreements, so these agreements have no impact on this AIS provision. In the few instances where such an agreement applies to a municipality, that municipality is under the obligation to determine its applicability and requirements and document the actions taken to comply for the State.

Waiver Process

The statute permits EPA to issue waivers for a case or category of cases where EPA finds (1) that applying these requirements would be inconsistent with the public interest; (2) iron and steel products are not produced in the US in sufficient and reasonably available quantities and of a satisfactory quality; or (3) inclusion of iron and steel products produced in the US will increase the cost of the overall project by more than 25 percent.

In order to implement the AIS requirements, EPA has developed an approach to allow for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow States, on behalf of the assistance recipients, to apply for waivers of the AIS requirement directly to EPA Headquarters. Only waiver requests received from states will be considered. Pursuant to the Act, EPA has the responsibility to make findings as to the issuance of waivers to the AIS requirements.

Definitions

The following terms are critical to the interpretation and implementation of the AIS requirements and apply to the process described in this memorandum:

Reasonably Available Quantity: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

Satisfactory Quality: The quality of iron or steel products, as specified in the project plans and designs.

Assistance Recipient: A borrower or grantee that receives funding from a State CWSRF or DWSRF program.

Step-By-Step Waiver Process

Application by Assistance Recipient

Each local entity that receives SRF water infrastructure financial assistance is required by section 436 of the Act to use American made iron and steel products in the construction of its project. However, the recipient may request a waiver. Until a waiver is granted by EPA, the AIS requirement stands, except as noted above with respect to municipalities covered by international agreements.

The waiver process begins with the SRF assistance recipient. In order to fulfill the AIS requirement, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American made iron and steel products. It is essential that the assistance recipient include the AIS terms in any request for proposals or solicitations for bids, and in all contracts (see Appendix 3 for sample construction contract language). The assistance recipient may receive a waiver at any point before, during, or after the bid process, if one or more of three conditions is met:

1. Applying the American Iron and Steel requirements of the Act would be inconsistent with the public interest;
2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Proper and sufficient documentation must be provided by the assistance recipient. A checklist detailing the types of information required for a waiver to be processed is attached as Appendix 1.

Additionally, it is strongly encouraged that assistance recipients hold pre-bid conferences with potential bidders. A pre-bid conference can help to identify iron and steel products needed to complete the project as described in the plans and specifications that may not be available from domestic sources. It may also identify the need to seek a waiver prior to bid, and can help inform the recipient on compliance options.

In order to apply for a project waiver, the assistance recipient should email the request in the form of a Word document (.doc) to the State SRF program. It is strongly recommended that the State designate a single person for all AIS communications. The State SRF designee will review the application for the waiver and determine whether the necessary information has been included. Once the waiver application is complete, the State designee will forward the application to either of two email addresses. For CWSRF waiver requests, please send the application to: cwsrfwaiver@epa.gov. For DWSRF waiver requests, please send the application to: dwsrfwaiver@epa.gov.

Evaluation by EPA

After receiving an application for waiver of the AIS requirements, EPA Headquarters will publish the request on its website for 15 days and receive informal comment. EPA Headquarters will then use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the State designee that a waiver request has been approved or denied as soon as such a decision has been made. Granting such a waiver is a three-step process:

1. Posting – After receiving an application for a waiver, EPA is required to publish the application and all material submitted with the application on EPA’s website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at: http://water.epa.gov/grants_funding/aisrequirement.cfm
2. Evaluation – After receiving an application for waiver of the AIS requirements, EPA Headquarters will use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.
3. Signature of waiver approval by the Administrator or another agency official with delegated authority – As soon as the waiver is signed and dated, EPA will notify the State SRF program, and post the signed waiver on our website. The assistance recipient should keep a copy of the signed waiver in its project files.

Public Interest Waivers

EPA has the authority to issue public interest waivers. Evaluation of a public interest waiver request may be more complicated than that of other waiver requests so they may take more time than other waiver requests for a decision to be made. An example of a public interest waiver that might be issued could be for a community that has standardized on a particular type or manufacturer of a valve because of its performance to meet their specifications. Switching to an alternative valve may require staff to be trained on the new equipment and additional spare parts would need to be purchased and stocked, existing valves may need to be unnecessarily replaced, and portions of the system may need to be redesigned. Therefore, requiring the community to install an alternative valve would be inconsistent with public interest.

EPA also has the authority to issue a public interest waiver that covers categories of products that might apply to all projects.

EPA reserves the right to issue national waivers that may apply to particular classes of assistance recipients, particular classes of projects, or particular categories of iron or steel products. EPA may develop national or (US geographic) regional categorical waivers through the identification of similar circumstances in the detailed justifications presented to EPA in a waiver request or requests. EPA may issue a national waiver based on policy decisions regarding the public's interest or a determination that a particular item is not produced domestically in reasonably available quantities or of a sufficient quality. In such cases, EPA may determine it is necessary to issue a national waiver.

If you have any questions concerning the contents of this memorandum, you may contact us, or have your staff contact Jordan Dorfman, Attorney-Advisor, State Revolving Fund Branch, Municipal Support Division, at dorfman.jordan@epa.gov or (202) 564-0614 or Kiri Anderer, Environmental Engineer, Infrastructure Branch, Drinking Water Protection Division, at anderer.kirsten@epa.gov or (202) 564-3134.

Attachments

Appendix 1: Information Checklist for Waiver Request

The purpose of this checklist is to help ensure that all appropriate and necessary information is submitted to EPA. EPA recommends that States review this checklist carefully and provide all appropriate information to EPA. This checklist is for informational purposes only and does not need to be included as part of a waiver application.

Items	✓	Notes
<p>General</p> <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> — Description of the foreign and domestic construction materials — Unit of measure — Quantity — Price — Time of delivery or availability — Location of the construction project — Name and address of the proposed supplier — A detailed justification for the use of foreign construction materials • Waiver request was submitted according to the instructions in the memorandum • Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor 		
<p>Cost Waiver Requests</p> <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> — Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products — Relevant excerpts from the bid documents used by the contractors to complete the comparison — Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers 		
<p>Availability Waiver Requests</p> <ul style="list-style-type: none"> • Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested: <ul style="list-style-type: none"> — Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials — Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers. — Project schedule — Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials • Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought • Has the State received other waiver requests for the materials described in this waiver request, for comparable projects? 		

Appendix 2: HQ Review Checklist for Waiver Request

Instructions: To be completed by EPA. Review all waiver requests using the questions in the checklist, and mark the appropriate box as Yes, No or N/A. Marks that fall inside the shaded boxes may be grounds for denying the waiver. If none of your review markings fall into a shaded box, the waiver is eligible for approval if it indicates that one or more of the following conditions applies to the domestic product for which the waiver is sought:

1. The iron and/or steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.
2. The inclusion of iron and/or steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Review Items	Yes	No	N/A	Comments
Cost Waiver Requests <ul style="list-style-type: none"> • Does the waiver request include the following information? <ul style="list-style-type: none"> – Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products – Relevant excerpts from the bid documents used by the contractors to complete the comparison – A sufficient number of bid documents or pricing information from domestic sources to constitute a reasonable survey of the market • Does the Total Domestic Project exceed the Total Foreign Project Cost by more than 25%? 				
Availability Waiver Requests <ul style="list-style-type: none"> • Does the waiver request include supporting documentation sufficient to show the availability, quantity, and/or quality of the iron and/or steel product for which the waiver is requested? <ul style="list-style-type: none"> – Supplier information or other documentation indicating availability/delivery date for materials – Project schedule – Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of materials • Does supporting documentation provide sufficient evidence that the contractors made a reasonable effort to locate domestic suppliers of materials, such as a description of the process for identifying suppliers and a list of contacted suppliers? • Based on the materials delivery/availability date indicated in the supporting documentation, will the materials be unavailable when they are needed according to the project schedule? (By item, list schedule date and domestic delivery quote date or other relevant information) • Is EPA aware of any other evidence indicating the non-availability of the materials for which the waiver is requested? Examples include: <ul style="list-style-type: none"> – Multiple waiver requests for the materials described in this waiver request, for comparable projects in the same State – Multiple waiver requests for the materials described in this waiver request, for comparable projects in other States – Correspondence with construction trade associations indicating the non-availability of the materials • Are the available domestic materials indicated in the bid documents of inadequate quality compared those required by the project plans, specifications, and/or permits? 				

Appendix 3: Example Loan Agreement Language

ALL ASSISTANCE AGREEMENT MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN SRF ASSISTANCE AGREEMENTS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE LAW:

Comply with all federal requirements applicable to the Loan (including those imposed by the 2014 Appropriations Act and related SRF Policy Guidelines) which the Participant understands includes, among other, requirements that all of the iron and steel products used in the Project are to be produced in the United States (“American Iron and Steel Requirement”) unless (i) the Participant has requested and obtained a waiver from the Agency pertaining to the Project or (ii) the Finance Authority has otherwise advised the Participant in writing that the American Iron and Steel Requirement is not applicable to the Project.

Comply with all record keeping and reporting requirements under the Clean Water Act/Safe Drinking Water Act, including any reports required by a Federal agency or the Finance Authority such as performance indicators of program deliverables, information on costs and project progress. The Participant understands that (i) each contract and subcontract related to the Project is subject to audit by appropriate federal and state entities and (ii) failure to comply with the Clean Water Act/Safe Drinking Water Act and this Agreement may be a default hereunder that results in a repayment of the Loan in advance of the maturity of the Bonds and/or other remedial actions.

Appendix 4: Sample Construction Contract Language

ALL CONTRACTS MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN ALL CONTRACTS IN PROJECTS THAT USE SRF FUNDS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE OR LOCAL LAW:

The Contractor acknowledges to and for the benefit of the City of _____ (“Purchaser”) and the _____ (the “State”) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as “American Iron and Steel;” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Appendix 5: Sample Certifications

The following information is provided as a sample letter of **step** certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Step Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Certification for Project (XXXXXXXXXXXX)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF WATER

DECISION MEMORANDUM

SUBJECT: De Minimis Waiver of Section 436 of P.L. 113-76, Consolidated Appropriations Act (CAA), 2014

FROM: Nancy K. Stoner
Acting Assistant Administrator

The EPA is hereby granting a nationwide waiver pursuant to the “American Iron and Steel (AIS)” requirements of P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), section 436 under the authority of Section 436(b)(1) (public interest waiver) for de minimis incidental components of eligible water infrastructure projects. This action permits the use of products when they occur in de minimis incidental components of such projects funded by the Act that may otherwise be prohibited under section 436(a). Funds used for such de minimis incidental components cumulatively may comprise no more than a total of 5 percent of the total cost of the materials used in and incorporated into a project; the cost of an individual item may not exceed 1 percent of the total cost of the materials used in and incorporated into a project.

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an “American Iron and Steel” (AIS) requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use specific domestic iron and steel products that are produced in the United States if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act), through the end of Fiscal Year 2014, unless the agency determines it necessary to waive this requirement based on findings set forth in Section 436(b). The Act states, “[the requirements] shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency... finds that— (1) applying subsection (a) would be inconsistent with the public interest” 436(b)(1).

In implementing section 436 of the Act, the EPA must ensure that the section's requirements are applied consistent with congressional intent in adopting this section and in the broader context of the purposes, objectives, and other provisions applicable to projects funded under the SRF. Water infrastructure projects typically contain a relatively small number of high-cost components incorporated into the project. In bid solicitations for a project, these high-cost components are generally described in detail via project specific technical specifications. For these major components, utility owners and their contractors are generally familiar with the conditions of availability, the potential alternatives for each detailed specification, the approximate cost, and the country of manufacture of the available components.

Every water infrastructure project also involves the use of thousands of miscellaneous, generally low-cost components that are essential for, but incidental to, the construction and are incorporated into the physical structure of the project. For many of these incidental components, the country of manufacture and the availability of alternatives is not always readily or reasonably identifiable prior to procurement in the normal course of business; for other incidental components, the country of manufacture may be known but the miscellaneous character in conjunction with the low cost, individually and (in total) as typically procured in bulk, mark them as properly incidental. Examples of incidental components could include small washers, screws, fasteners (i.e., nuts and bolts), miscellaneous wire, corner bead, ancillary tube, etc. Examples of items that are clearly not incidental include significant process fittings (i.e., tees, elbows, flanges, and brackets), distribution system fittings and valves, force main valves, pipes for sewer collection and/or water distribution, treatment and storage tanks, large structural support structures, etc.

The EPA undertook multiple inquiries to identify the approximate scope of de minimis incidental components within water infrastructure projects during the implementation of the American Reinvestment and Recovery Act (ARRA) and its requirements (Buy American provisions, specifically). The inquiries and research conducted in 2009 applies suitably for the case today. In 2009, the EPA consulted informally with many major associations representing equipment manufacturers and suppliers, construction contractors, consulting engineers, and water and wastewater utilities, and performed targeted interviews with several well-established water infrastructure contractors and firms who work in a variety of project sizes, and regional and demographic settings to ask the following questions:

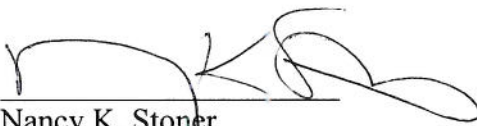
- What percentage of total project costs were consumables or incidental costs?
- What percentage of materials costs were consumables or incidental costs?
- Did these percentages vary by type of project (drinking water vs. wastewater treatment plant vs. pipe)?

The responses were consistent across the variety of settings and project types, and indicated that the percentage of total costs for drinking water or wastewater infrastructure projects represented by these incidental components is generally not in excess of 5 percent of the total cost of the materials used in and incorporated into a project. In drafting this waiver, the EPA has considered the de minimis proportion of project costs generally represented by each individual type of these incidental components within the many types of such components comprising those percentages, the fact that these types of incidental components are obtained by contractors in many different ways from many different sources, and the disproportionate cost and delay that would be imposed on projects if the EPA did not issue this waiver.

Assistance recipients who wish to use this waiver should in consultation with their contractors determine the items to be covered by this waiver and must retain relevant documentation (i.e., invoices) as to those items in their project files.

If you have any questions concerning the contents of this memorandum, please contact Timothy Connor, Chemical Engineer, Municipal Support Division, at connor.timothy@epa.gov or (202) 566-1059 or Kirsten Anderer, Environmental Engineer, Drinking Water Protection Division, at anderer.kirsten@epa.gov or (202) 564-3134.

Issued on: APR 15 2014

Approved by: 
Nancy K. Stoner
Acting Assistant Administrator




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 20 2018

OFFICE OF WATER

MEMORANDUM

SUBJECT: Application of American Iron and Steel Requirements for Drinking Water State Revolving Fund Projects for Fiscal Years 2019 Through 2023

FROM: Anita Maria Thompkins, Director
Drinking Water Protection Division 

TO: Water Management Division Directors
Regions I-X

On October 23, 2018, the President signed the "America's Water Infrastructure Act of 2018" (AWIA), which includes several updates and revisions to the Safe Drinking Water Act (SDWA), including the Drinking Water State Revolving Fund (DWSRF) provisions. Section 2022 of AWIA amended Section 1452(a)(4)(A) of SDWA to extend the requirement for the use of American Iron and Steel (AIS) products in projects receiving financial assistance from the DWSRF during fiscal years 2019 through 2023. Section 1452(a)(4) includes "American Iron and Steel" requirements that recipients of DWSRF assistance are to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system.

All assistance agreements starting October 1, 2018, through September 30, 2023, must include the AIS requirements until that condition is no longer statutorily mandated. Prior appropriations acts, starting with the Consolidated Appropriations Act of 2014 (P.L. 113-76) and continuing through FY2018, have included the AIS requirements. In addition, all guidance issued since FY 2014 will also continue to be applicable until the AIS provision is no longer required.

If you have any questions, please contact Kiri Anderer (202-564-3134 or anderer.kirsten@epa.gov).

cc: Ronald Bergman, Associate Division Director, Drinking Water Protection Division
Elizabeth Corr, Associate Division Director, Drinking Water Protection Division
Felecia Fort, Associate Chief, Infrastructure Branch
Kiri Anderer, Senior Environmental Engineer, DWSRF
Jorge Medrano, Environmental Engineer, DWSRF
Dallas Shattuck, Physical Scientist, DWSRF

PRIME CONTRACTOR'S CERTIFICATION

American Iron and Steel Requirements

Date:

**RE: [Project Name]
[Owner's Name]
[Construction Contract Name]**

I hereby certify that to the best of my knowledge and belief, all iron and steel products installed for this project by my company and by any and all subcontractors and manufacturers my company has contracted with for this project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Name of Construction Company (PRINT)

By Authorized Representative (SIGNATURE)

Title

This certification is to be submitted to the Engineer upon Substantial Completion of the project

CONSERVATION AND MITIGATION MONITORING PLAN

ATTACHMENT C

5.0 Mitigation Monitoring and Reporting Program

5.0 MITIGATION MONITORING AND REPORTING PROGRAM

This chapter describes the Mitigation Monitoring and Reporting Program (MMRP) for the Lewiston Community Services District (LCSD) Water Distribution System Replacement and Well 8 Project (project). The purpose of this MMRP is to memorialize the mitigation responsibilities of LCSD in implementing the proposed project. The mitigation measures listed herein are required by law or regulation and will be adopted by LCSD as part of the overall project approval. Mitigation is defined by California Environmental Quality Act (CEQA) Guidelines Section 15370 as a measure that

- *avoids the impact altogether by not taking a certain action or parts of an action;*
- *minimizes impacts by limiting the degree or magnitude of the action and its implementation;*
- *rectifies the impact by repairing, rehabilitating, or restoring the impacted environment;*
- *reduces or eliminates the impact over time by preservation and maintenance operations during the life of the project; or*
- *compensates for the impacts by replacing or providing substitute resources or environments.*

Mitigation measures provided in this MMRP have been identified in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures of the Initial Study (IS)/Mitigated Negative Declaration (MND) and are considered feasible and effective in mitigating project-related environmental impacts.

This MMRP includes discussions of the following: legal requirements, the intent of the MMRP; the development and approval process for the MMRP; the authorities and responsibilities associated with implementation of the MMRP; a method of resolution of noncompliance complaints; and a summary of monitoring requirements.

Legal Requirements: The legal basis for the development and implementation of the MMRP lies within CEQA (including the California Public Resources Code (PRC). PRC Sections 21002 and 21002.1 state the following:

Public agencies are not to approve projects as proposed if there are feasible alternatives or feasible mitigation measures available that would substantially lessen the significant environmental effects of such projects.

Each public agency shall mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so.

Section 21081.6 of the California Public Resources Code further requires the following:

The public agency shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation.

The monitoring program must be adopted when a public agency makes its findings under CEQA so that the program can be made a condition of project approval in order to mitigate significant

5.0 Mitigation Monitoring and Reporting Program

effects on the environment. The program must be designed to ensure compliance with mitigation measures during project implementation to mitigate or avoid significant environmental effects.

Intent of the Mitigation Monitoring and Reporting Program: The MMRP is intended to satisfy the requirements of CEQA as they relate to the project. It will be used by LCSD, participating agencies, project contractors, and mitigation monitoring personnel during implementation of the project. The primary objective of the MMRP is to ensure the effective implementation and enforcement of adopted mitigation measures and permit conditions. The MMRP will provide for monitoring of construction activities as needed, onsite identification and resolution of environmental problems, and proper reporting to lead agency staff.

Development and Approval Process: The timing elements for implementing mitigation measures and the definition of the approval process are provided in detail throughout this MMRP to assist LCSD by providing the most usable monitoring document possible.

Authorities and Responsibilities: LCSD, functioning as the CEQA Lead Agency, will have the primary responsibility for overseeing the implementation of the MMRP and will be responsible for the following activities:

- coordination of monitoring activities
- reviewing and approving status reports
- maintenance of records concerning the status of all approved mitigation measures

As the implementing agency, LCSD is responsible for implementing the mitigation measures by incorporating them into the project specifications (contract documents) and enforcing the conditions of the contract in the field during construction. Some pre- and post-construction activities may be implemented directly by the LCSD.

Resolution of Noncompliance Complaints: Any person or agency may file a complaint that alleges noncompliance with the mitigation measure(s) adopted as part of the approval process for the proposed project. The complaint would be directed to LCSD in written form describing the purported violation in detail. LCSD would investigate and determine the validity of the complaint. If noncompliance with a mitigation measure is verified, LCSD would take the necessary action(s) to remedy the violation. Complaints would be responded to in writing, including descriptions of LCSD's investigation findings and the corrective action(s) taken, if applicable.

Summary of Monitoring Requirements: Following this discussion are the conservation measures, mitigation measures and associated monitoring requirements for the proposed project. Conservation measures include standard best management practices (BMPs) that will be used during construction. Mitigation measures are organized by environmental issue area (e.g., Air Quality, Biological Resources).

- **Conservation Measures:** describes the schedules of activities, prohibitions of practices, maintenance procedures, and structural or managerial practices, that will be used either singly or in combination to prevent or reduce the release of pollutants, or otherwise minimize the potential for adverse effects on environmental resources. The same conservation numbering system used in the IS/MND is carried forward in this MMRP.

5.0 Mitigation Monitoring and Reporting Program

- **Mitigation Measure(s):** lists the mitigation measure(s) identified for each potentially significant impact discussed in the IS/MND. The same mitigation numbering system used in the IS/MND is carried forward in this MMRP.
- **Timing/Implementation:** Indicates at what point in time or project phase the mitigation measure will need to be implemented.
- **Enforcement:** Indicates which agency or entity is responsible for enforcement of the mitigation measure(s).
- **Monitoring:** Indicates which agency or entity is responsible for implementing and monitoring each mitigation measure.
- **Verification:** Provides a space to be signed and dated by the individual responsible for verifying compliance with each mitigation measure.

5.1 CONSERVATION MEASURES

The following conservation measures and BMPs will be followed during project construction to avoid or minimize potential environmental impacts:

5.1.1 Conservation Measure #1—Air Quality/Fugitive Dust and Emissions Controls

Air pollution control will conform to all applicable air pollution control rules, regulations, ordinances, and statutes. Dust will be controlled during construction activities and subsequent operation of the project. Dust controls may include but will not be limited to the following elements, as appropriate:

- Water construction sites and exposed stockpile sites at least twice daily until soils are stable, or as needed to reduce airborne dust. Watering will occur on workdays and non-workdays.
- Pursuant to California Vehicle Code (Section 23114) (California Legislative Information 2020), all trucks hauling soil and other loose material to and from the construction site will be covered or will maintain at least 6 inches of freeboard (i.e., minimum vertical distance between the top of the load and the upper edge of the trailer).
- Any topsoil that is removed for the construction operation will be stored on-site in piles not to exceed 4 feet in height to allow development of microorganisms prior to re-soiling of the construction area. These topsoil piles will be clearly marked and flagged. Topsoil piles that will not be immediately returned to use will be revegetated with a non-persistent erosion control mixture.
- Soil piles for backfill will be marked and flagged separately from native topsoil stockpiles. These soil piles will also be surrounded by silt fencing, straw wattles, or other sediment barriers, or covered unless they are to be immediately used.
- Equipment and manual watering will be conducted on all stockpiles, dirt/gravel roads, and exposed or disturbed soil surfaces, as necessary, to reduce airborne dust.

5.0 Mitigation Monitoring and Reporting Program

- Contractors will commit to using the best available emissions control technology. The use of diesel construction equipment meeting the California Air Resources Board 1996 or newer certification standard for off-road heavy-duty diesel engines and having Tier 4 engines will be maximized to the extent feasible. Equipment may be electrified if feasible, and gasoline-powered equipment should be substituted for diesel-powered equipment when feasible, unless alternatively fueled construction equipment can be used. If the use of all equipment with Tier 4 engine standards is not feasible, the contractor should commit to using California Air Resources Control Board and Environmental Protection Agency-verified particulate traps, oxidation catalysts, and other appropriate controls when suitable to reduce emissions of diesel particulate matter and other pollutants during construction.
- The construction contractor will designate a person to monitor dust control and to order increased watering as necessary to prevent transport of dust offsite. This person will also respond to any citizen complaints.

5.1.2 Conservation Measure #2—Erosion and Sedimentation Control

BMPs for erosion control will be implemented during project construction. Erosion control measures included in the construction contract and to be implemented by the contractor include the following. Additional measures will be detailed in the project's Storm Water Pollution Prevention Plan.

- To the maximum extent practicable, activities that increase the erosion potential in the project area will be restricted to the relatively dry summer and early fall period to minimize the potential for rainfall events to transport sediment to surface water features. Upland construction will likely occur throughout the year, as long as work activities comply with the conservation and avoidance and minimization measures identified herein for the protection of sensitive or special-status plant or animal species. For upland construction activities that must take place during the late fall, winter, or spring, temporary erosion and sediment control structures will be in place and operational at the end of each construction day and will be maintained until permanent erosion control structures are in place.
- Areas where upland vegetation needs to be removed will be identified in advance of ground disturbance and limited to only those areas that have been approved by LCSD. Exclusionary fencing will be installed around areas that do not need to be disturbed.
- Within 10 days of completion of construction in those areas where subsequent ground disturbance will not occur for 10 calendar days or more, weed-free mulch will be applied to disturbed areas to reduce the potential for short-term erosion. Prior to a rain event or when there is a greater than 50 percent possibility of rain within the next 24 hours as forecasted by the National Weather Service, weed-free mulch will be applied to all exposed areas upon completion of the day's activities. Soils will not be left exposed during the rainy season.
- Suitable BMPs, such as silt fences, straw wattles, or catch basins will be placed below all construction activities at the edge of surface water features to intercept sediment before it reaches the waterway. These structures will be installed prior to any clearing or grading activities. Further, sediment built up at the base of BMPs will be removed before BMP removal to avoid any accumulated sediments from being mobilized post-construction.

5.0 Mitigation Monitoring and Reporting Program

- If spoil sites are used, they will be placed in locations that will avoid draining directly into a surface water feature, if possible. If a spoil site drains into a surface water feature, catch basins will be constructed to intercept sediment before it reaches the feature. Spoil sites will be graded and vegetated with native species to reduce the potential for erosion.
- Sediment control measures will be in place prior to the onset of the rainy season and will be monitored and maintained in good working condition until disturbed areas have been revegetated with native species.

5.1.3 Conservation Measure #3—Prevention of Accidental Spills of Pollutants

Construction specifications will include the following measures to reduce potential impacts on vegetation and aquatic habitat resources in the project area associated with accidental spills of pollutants (e.g., fuel, oil, and grease):

- A site-specific spill prevention plan will be implemented for potentially hazardous materials. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting any spills. If necessary, containment berms will be constructed to prevent spilled materials from reaching surface water features.
- Equipment and hazardous materials will be stored 50 feet away from surface water features.
- Vehicles and equipment used during construction will receive proper and timely maintenance to reduce the potential for mechanical breakdowns leading to a spill of materials. Maintenance and fueling will be conducted within an adequate fueling containment area.

5.1.4 Conservation Measure #4—Prevention of Spread of Invasive Species

The following measures will be implemented to prevent the spread of invasive species in the project area:

- All equipment used for off-road construction activities will be weed-free prior to entering the project area.
- If project implementation calls for mulches or fill, they will be weed-free.
- Any seed mixes or other vegetative material used for revegetation of disturbed sites will consist of locally adapted native plant materials to the extent practicable.
- Non-native and invasive species removed during project construction will be properly disposed of to prevent the spread of non-native and invasive species.

5.1.5 Conservation Measure #5—Cultural Resources and Human Remains

Surface surveys are not infallible and buried resources may be overlooked. Implementation of the following conservation measures will avoid or minimize the potential for significant effects to newly discovered resources:

5.0 Mitigation Monitoring and Reporting Program

- Construction contract documents include provisions to respond to archaeological resources discovered during the project. In the event that previously unknown archaeological resources are discovered during project activities, all work in the immediate vicinity of the discovery will be stopped immediately, and the contractor will notify the LCSD. An archaeologist meeting the Secretary of Interior’s Professional Qualifications Standards will be retained to evaluate the discovery and recommend appropriate treatment. The conservation measures will be implemented prior to re-initiation of activities in the immediate vicinity of the discovery. If the resource that is discovered is prehistoric or Native American in nature, a Native American monitor will be present during subsequent project ground disturbance.
- If human remains are discovered during project activities, all activities near the find will be suspended and the Trinity County Sheriff–Coroner will be notified. If the coroner determines that the remains may be those of a Native American, the coroner will contact the Native American Heritage Commission. Treatment of the remains will be conducted in accordance with the direction of the County Coroner and/or Native American Heritage Commission as appropriate.

5.1.6 Conservation Measure #6—Greenhouse Gas Emissions

Construction contract documents include provisions to minimize project-related greenhouse gas emissions. The following measures will be implemented to reduce construction-related greenhouse gas emissions:

- Reuse and recycle construction and demolition waste, including but not limited to soil, vegetation, concrete, lumber, metal, and cardboard.
- Ensure that the project enhances and does not disrupt or create barriers to non-motorized transportation (e.g., bicycles, pedestrians) through proper pre-construction planning.
- Protect existing trees to the extent possible and encourage the planting of new trees.

5.1.7 Conservation Measure #7—Wildfire Potential

Construction contract documents include measures to minimize project-related potential for wildfire ignition:

- Per the requirements of PRC Section 4442, LCSD will include a note on all construction plans that internal combustion engines will be equipped with an operational spark arrester, or the engine must be equipped for the prevention of fire.

5.1.8 Conservation Measure #8—Construction Noise

Construction contract documents include provisions to minimize project-related noises. The following measures will be implemented to reduce construction-related noise:

- Construction activities (excluding activities that would result in a safety concern to the public or construction workers) will be limited to between the daylight hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and 8:00 a.m. and 5:00 p.m. on Saturdays. Construction activities will be prohibited on Sundays and holidays officially recognized by LCSD, unless otherwise approved by LCSD.

5.0 Mitigation Monitoring and Reporting Program

- Construction equipment will be properly maintained and equipped with noise-reduction intake and exhaust mufflers in accordance with manufacturers' recommendations.
- When not in use, motorized construction equipment will not be left idling for more than 5 minutes.
- Stationary equipment (e.g., generators or compressors) will be located at the furthest practicable distance from nearby noise-sensitive land uses. If necessary, noise attenuation measures sufficient to achieve compliance with the Trinity County General Plan Noise Element (Trinity County 2003) will be implemented.

5.2 MITIGATION MEASURES

This MMRP includes the following mitigation measures to be implemented during construction of the project:

5.2.1 Mitigation Measure #1—Yellow Warbler and Yellow Breasted Chat

The following measures will be implemented to avoid or minimize the potential for significant impacts on yellow warbler and yellow breasted chat:

- If all necessary approvals have been obtained, potential nesting substrate (e.g., shrubs and trees) will be removed by the Lewiston Community Services District Water Distribution System Project (project) before the onset of the nesting season (i.e., February 15 through August 31), if practicable. This will help preclude nesting and will substantially decrease the likelihood of direct impacts.
- If construction occurs during the nesting season (February 15 through August 31), a qualified biologist will conduct a pre-construction survey for nesting yellow warbler and yellow breasted chat. The effort will include surveying the project area and within a 50-foot buffer of the project area for nests, where access is permitted. The pre-construction survey will be performed no more than 7 days prior to the implementation of construction activities (including staging and equipment access). If a lapse in construction activities of 7 days or longer occurs between those dates, another pre-construction survey will be performed.
- If an active yellow warbler or yellow breasted chat nest is found, a qualified biologist in consultation with California Department of Fish and Wildlife (CDFW) will determine the extent of a construction-free buffer zone to be established around the nest.

Timing/Implementation:	Prior to and during construction
Enforcement:	CDFW, LCSD
Monitoring:	LCSD and/or its contractor

5.2.2 Mitigation Measure #2—Migratory Birds and Raptors

The following measures will be implemented to avoid or minimize the potential for adverse impacts on nesting migratory birds and raptors:

- If all necessary approvals have been obtained, potential nesting substrate (e.g., shrubs and trees) that will be removed by the project shall be removed before the onset of the nesting season (February

5.0 Mitigation Monitoring and Reporting Program

1 through August 31), if practicable. This will help preclude nesting and will substantially decrease the likelihood of direct impacts.

- If construction occurs during the nesting season (February 1 through August 31), a qualified biologist will conduct a pre-construction survey of the project area, as access is available, that will include an assessment for all raptor species and an assessment for all other species within a 50-foot buffer from the outer edges of the project area in order to locate any active bird nests and, if necessary, identify measures to protect the nests. The pre-construction survey will be performed between February 1 and August 31, but no more than 7 days prior to the implementation of construction activities (including staging and equipment access). If a lapse in construction activities of 7 days or longer occurs between those dates, another pre-construction survey will be performed.
- If an active nest is found, a qualified biologist (in consultation with CDFW) will determine the extent of a construction-free buffer zone to be established around the nest.

Timing/Implementation: Prior to and during construction

Enforcement: CDFW, LCSD

Monitoring: LCSD and its contractor

5.2.3 Mitigation Measure #3—Asbestos

The following measures will be implemented to avoid or minimize the potential for exposure to asbestos:

- National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations require notification of the demolition be submitted to the North Coast Unified Air Quality Management District on behalf of the federal Environmental Protection Agency (NESHAP Section 61.145(b)). Notifications must contain certain specified information including but not limited to the scheduled start and completion date of the work, the location of the site, the names of operators or asbestos removal contractors, methods of removal and the amount of asbestos, and whether the operation is a demolition or renovation.
- After excavation, asbestos cement (AC) pipe shall be wet-cut, wrapped for containment, and removed for disposal to a landfill qualified to receive asbestos waste.

Timing/Implementation: Prior to and during construction

Enforcement: LCSD

Monitoring: LCSD and/or its contractor

5.2.4 Mitigation Measure #4—Lead Abatement and Disposal

The following measures will be implemented to avoid or minimize the potential for exposure to lead:

- Lead-containing materials shall be abated prior to planned construction/demolition by a licensed contractor in accordance with 17 California Code of Regulations (CCR) 3500.
- Lead-containing materials must be transported under a Uniform Hazardous Waste Manifest (Title 22 CCR, Section 6626.23). It must be disposed of either at a Class I landfill or at other landfills that have specific permits to accept these wastes.

5.0 Mitigation Monitoring and Reporting Program

- Demolition and construction work shall be subject to the applicable work practices for lead hazards including the following:
 - California Construction Order 1532.1(a)
 - Lead-in-Construction Standard
 - Title 17, CCR, Division 1, Chapter 8
 - Work Practices for Lead-Based Paint and Lead Hazards
- If more than 100 square or linear feet of lead-containing materials are disturbed, steps must be taken to prevent worker exposure to lead. The Department of Industrial Relations shall be notified at least 24 hours prior to beginning work.

Timing/Implementation: Prior to and during construction

Enforcement: LCSD

Monitoring: LCSD and/or its contractor

TRINITY PUBLIC UTILITIES DISTRICT PRELIMINARY DESIGN

ATTACHMENT D



Location 4

Set a FM2S, cI200 meter.

Location 3

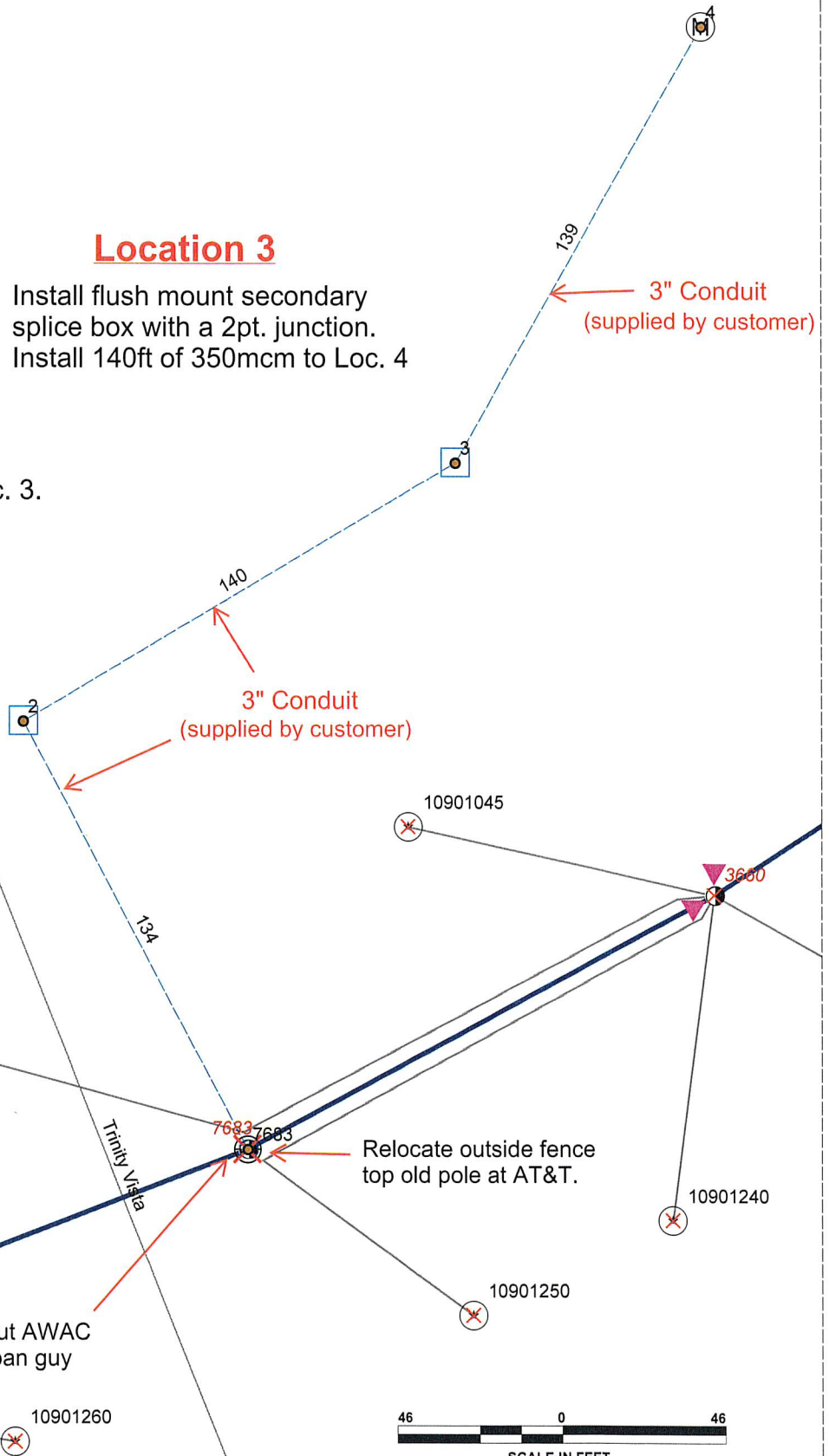
Install flush mount secondary splice box with a 2pt. junction.
Install 140ft of 350mcm to Loc. 4

Location 2

Install flush mount secondary splice box with a 2pt junction.
Install 140ft of 350mcm to Loc. 3.

TPUD 7683

Set a 45ft. class 3 pole. Frame three phase, tangent. Install a 25kVA, 12kV, 120/240V transformer with 5A fault tamers. Install 135ft (plus riser) of 350mcm to Location 2. Wreck out AWAC to 7684 and install span guy. Reconnect 10901250.



Description : 100A OH Service

482.311

Joint Pole #:

W/O#: 20220223

Address: North end of Trinity Vista

City/St.: Lewiston, CA

Phone: 530-778-3869

Project Manager: DELMONT F SENTER

Issue Date: 06/20/2022

Warehouse: 1

Page 1 of 2

STAKING SHEET

W/O#: 20220223

Project Manager: DELMONT F SENTER Joint Pole #:

Description: 100A OH Service

Date Staked: 06/20/2022 12:18:50 PM

Substation: 3 - Lewiston

Name: LEWISTON CSD

Completed By:

Feeder: Lewiston 1101

Address: North end of Trinity Vista

Date Completed:

Phase: AC

Comment: Relocate 7683 8ft west w/ 45ft cl3. Install 25kVA, 12kV, 120.240V with 5A fault tamers, build secondary riser and install 413 ft plus riser of 350mcm via 2 splice boxes to 100A panel. Set FM2S cl200 meter.

Position: 7683

Backspan To:

R / A	QTY	UNIT	DESCRIPTION	NOTE
RETIRE	1	40FT/CL3	POLE 40' WITH NUMBER TAG	
RETIRE	1	D CLEVIS	ONE SPOOL RACK	
RETIRE	1	SB 3	Side Bracket Triangle 3ph	
ADD	1	12 25KVA OH	TRANSFORMER OH 12KV 25KVA	# _____
ADD	1	190-58	GUY, SPAN, 5/16"	
ADD	1	45FT/CL3	POLE 45' WITH NUMBER TAG	
ADD	1	960-10	CUTOUT, FAULT TAMER	
ADD	1	980-20	RISER ASSEMBLY SECONDARY 3"	
ADD	1	C1.8 SINGLE	8 ft 3ph triangle	
ADD	1	D CLEVIS	ONE SPOOL RACK	

Position: 2

Backspan To: 7683

R / A	QTY	UNIT	DESCRIPTION	NOTE
ADD	1	350 ASSY UG	350 connectors all UG	
ADD	134	350 MCM	350MCM TRIPLEX UG SECONDARY	
ADD	1	970-20	SECONDARY HAND HOLE BELOW GRND	

Position: 3

Backspan To: 2

R / A	QTY	UNIT	DESCRIPTION	NOTE
ADD	1	350 ASSY UG	350 connectors all UG	
ADD	140	350 MCM	350MCM TRIPLEX UG SECONDARY	
ADD	1	970-20	SECONDARY HAND HOLE BELOW GRND	

Position: 4

Backspan To: 3

R / A	QTY	UNIT	DESCRIPTION	NOTE
ADD	1	2100-010	METER, FM2S, CL200	# _____
ADD	1	350 ASSY UG	350 connectors all UG	
ADD	139	350 MCM	350MCM TRIPLEX UG SECONDARY	

Wire Tally

Action	Conductor	Wire Feet	No. of Wires	Pole Line	Start	End	Total
A	350 ASSY UG	3	1	413			
A	350 MCM	413	1	413			
Contractor		Yes	No				

100% DRAFT

LEWISTON COMMUNITY SERVICES DISTRICT

PROJECT MANUAL – VOLUME 2

FOR CONSTRUCTION OF

WELL 8 PROJECT

**THIS PROJECT IS FUNDED IN PART THROUGH
DRINKING WATER STATE REVOLVING FUND (DWSRF)
DWSRF PROJECT No. 5301002-004C
AND STATE OF CALIFORNIA - NATURAL RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION PER CAPITA GRANT
PROGRAM**

OCTOBER 2022

JOB No. 2399.08



**FOR INFORMATION ON THIS PROJECT, CONTACT
NICOLE HUMPHREYS OR TOM WARNOCK AT 530-244-0202**



SECTION 012100 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Measurement and payment descriptions for contract bid items.

1.2 COORDINATION WITH OTHER CONTRACT PROVISIONS

A. The Contractor is also directed to the following sections of the Project Manual for other provisions related to "Measurement and Payment:"

1. Standard General Conditions (SGC), Article 15.
2. Modifications to SGCs located in the Supplementary Conditions, Section 00800.

1.3 MEASUREMENT AND PAYMENT DESCRIPTIONS FOR CONTRACT BID ITEMS

A. Payment for water main piping, valves, and appurtenances will not be made for piping which is included within the Limits of Payment established for other proposal items.

B. Payment for miscellaneous piping and plumbing work associated with each item of work shall be included in the price stated in the proposal for that item of work.

C. Bid Item No. 1 – Permits and miscellaneous plan(s), complete:

1. Basis of Measurement: Lump sum.
2. Basis of Payment: Includes payment for preparations of all necessary permits and miscellaneous plans, including but not limited to grading permits, traffic control plan, erosion control plan, and any plans associated with the conservation and mitigation monitoring plan included in Attachment C of the Project Manual. Includes all labor, equipment, and materials necessary for the implementation of said permits and plans.

D. Bid Item No. 2 – Site grading and road:

1. Basis of Measurement: Cubic yard.
2. Basis of Payment: Includes payment for materials, equipment, preparation of the site, and installation of materials necessary to grade the site as shown on Sheet C1 of the Drawings, complete. Includes payment for materials, equipment, preparation of the road, and installation of materials necessary to install the new aggregate base roadway as shown on Sheet C1 of the Drawings, complete.

- E. Bid Item No. 3 – Excavate building foundation and install engineered fill, complete:
1. Basis of Measurement: Cubic yard.
 2. Basis of Payment: Includes materials, equipment, preparation of the building foundation excavation site, excavation of the building foundation, and installation of engineered fill, complete.
- F. Bid Item No. 4 – Building reinforced concrete foundation, footing, and slab, complete:
1. Basis of Measurement: Cubic yard.
 2. Basis of Payment: Includes materials, equipment, preparation of the foundation, footing, rebar, and slab, and installation of the foundation, footing, rebar, and slab, complete.
- G. Bid Item No. 5 – Building masonry, complete:
1. Basis of Measurement: Square foot.
 2. Basis of Payment: Includes furnishing and installing all of the equipment and materials necessary to build the Well 8 building masonry, complete.
- H. Bid Item No. 6 – Building roof, complete:
1. Basis of Measurement: Square foot.
 2. Basis of Payment: Includes furnishing and installing all of the equipment and materials necessary to build the Well 8 ceiling and roof, complete. Includes the roof hatch, and insulation, complete.
- I. Bid Item No. 7 – Building painting, complete:
1. Basis of Measurement: Square foot.
 2. Basis of Payment: Includes furnishing all materials and labor to paint the interior and exterior of the building, complete.
- J. Bid Item No. 8 – HVAC and appurtenances, complete:
1. Basis of Measurement: Lump sum.
 2. Basis of Payment: Includes furnishing and installing all HVAC, complete, as shown on Sheet M2.0 of the Drawings.
- K. Bid Item No. 9 – Well 8 pump and appurtenances, complete:
1. Basis of Measurement: Lump sum.
 2. Basis of Payment: Includes furnishing and installing the pump, drop pipe, well seal, complete, as specified in the technical specifications. Includes all disinfection and testing of the pump and drop pipe, complete.

- L. Bid Item No. 10 – Furnish and install process piping and appurtenances, complete:
1. Basis of Measurement: Lump Sum.
 2. Basis of Payment: Includes furnishing and installing all process piping, valves, fittings, pipe supports, hose bibbs, hose rack, and appurtenances inside the Well 8 building, complete. Includes furnishing and installing, the process piping and fittings below grade within the footprint of the Well 8 building, up to and including the flexible coupling. Includes furnishing and installing the above grade process piping, fittings, valves, pipe supports, manhole, drain rock, and appurtenances, complete, to the east of the Well 8 building. Includes furnishing and installing both floor drains to the manhole, complete. Includes disinfection and testing of all process piping.
- M. Bid Item No. 11 – Disinfection system:
1. Basis of Measurement: Lump sum.
 2. Basis of Payment: Includes furnishing and installing all equipment and materials inside the chlorine room, complete.
- N. Bid Item No. 12 – Well 8 electrical, complete:
1. Basis of Measurement: Lump sum.
 2. Basis of Payment: Includes furnishing, and installing of all electrical equipment as shown on Sheets E1.0 through E4.0, complete.
- O. Bid Item No. 13 – Trinity Public Utility District coordination, fees, design, and installation, complete:
1. Basis of Measurement: Lump sum.
 2. Basis of Payment: Includes coordination with Trinity Public Utility District and PACE Engineering, Inc. to finalize the design of the utility power for Well 8. Includes any fees required by Trinity Public Utility District to finalize design. Includes furnishing and installation of all materials necessary to install utility power to Well 8. See Trinity Public Utility District's preliminary design included as Attachment D to the Project Manual.
- P. Bid Item No. 14 – Startup and testing:
1. Basis of Measurement: Lump sum.
 2. Basis of Payment: Includes furnishing all materials, tools, and labor to perform startup and testing of Well 8, including Operational Readiness Test (ORT) and Functional Acceptance Test (FAT).
- Q. Bid Item No. 15 – Well 8 connection to distribution system:
1. Basis of Measurement: Linear feet.
 2. Basis of Payment: Includes furnishing, installing, testing, and disinfecting the pipe, complete together with appurtenances not otherwise listed in the Proposal. Measurement of pipe length for payment shall be the lineal distance along the centerline of the pipe including valves, meters, and fittings, complete.

R. Bid Item No. 16 – Community Park bathrooms connection, complete:

1. Basis of Measurement: Lump sum.
2. Basis of Payment: Includes furnishing, installing, testing, and disinfecting the pipe, including valves and fittings, complete, together with appurtenances not otherwise listed in the Proposal from the tee at Trinity Vista where Well 8 connects the main to the Community Park Bathrooms tie-in. Includes exposing and capping the existing Community Park Bathrooms service behind the bathrooms. Includes furnishing, installing, testing, and disinfection of a new water meter, angle meter stop, and meter box and lid, complete.

S. Bid Item No. 17 – Irrigation connection, complete:

1. Basis of Measurement: Lump sum.
2. Basis of Payment: Includes furnishing, installing, testing, and disinfecting the pipe, including valves and fittings, complete together with appurtenances not otherwise listed in the Proposal from the tee at Well 8, through the irrigation meter and backflow prevention device to the Irrigation tie-in location. Includes exposing and abandoning the existing Irrigation line called to be abandoned. Includes furnishing, installing, testing, and disinfection of a new water meter, angle meter stop, meter box and lid, backflow prevention device, enclosure, and appurtenances, complete.

T. Bid Item No. 18 – Irrigation controller relocation, complete:

1. Basis of Measurement: Lump sum.
2. Basis of Payment: Includes removing the existing irrigation controller from the Community Park Well building and installing the controller in the Well 8 building. Includes reconnecting the controller to the existing irrigation control system located adjacent to the irrigation tie-in location. Includes testing of the existing controller to verify it operates the irrigation system, complete.

U. Bid Item No. 19 – Trenching, sheeting, and shoring:

1. Basis of Measurement: Lump sum.
2. Basis of Payment: Includes full compensation for furnishing all labor, equipment, and materials necessary to provide safe excavations in accordance with Cal/OSHA and other applicable requirements and regulations.

V. Bid Item No. 20 – Materials on hand:

1. Basis of Measurement: Lump sum.
2. Basis of Payment: Includes all material costs that are furnished and delivered to the project site and properly stored prior to being installed. The Contractor shall furnish the Engineer with copies of invoices of the acceptable materials to verify their value and that they are for this project to establish the Owner's interest. No payment can be made for materials not delivered to the project work site and/or without an invoice.
3. The Contractor shall be responsible for damage or loss of all job site materials, regardless of payment, until final project acceptance.

W. Items not listed:

1. Payment shall be included in the most applicable lump-sum bid item in the Proposal.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION 012100

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formwork for cast-in-place concrete.
2. Shoring, bracing, and anchorage.
3. Wood form materials.
4. Prefabricated forms.
5. Formwork accessories.
6. Form stripping.

B. Related Requirements:

1. Section 032000 - Concrete Reinforcing: Reinforcing steel and required supports for cast-in-place concrete.
2. Section 033000 - Cast-in-Place Concrete: Cast-in-place or in-situ concrete for structural building frame, slabs-on-grade, and other concrete components associated with building.
3. Section 055000 - Metal Fabrications: Product requirements for metal fabrications for placement by this Section.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.
- B. American Concrete Institute:
 1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
 2. ACI 301 - Specifications for Structural Concrete.
 3. ACI 318 - Building Code Requirements for Structural Concrete.
 4. ACI 347 - Guide to Formwork for Concrete.
- C. American Forest & Paper Association:
 1. AF&PA - National Design Specification (NDS) for Wood Construction.
- D. APA - The Engineered Wood Association:
 1. APA/EWA PS 1 - Voluntary Product Standard - Structural Plywood.

- E. ASTM International:
 - 1. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - 2. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
- F. West Coast Lumber Inspection Bureau:
 - 1. WCLIB - Standard No. 17 Grading Rules for West Coast Lumber.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work of this Section with other Sections of Work in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

1.5 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Shop Drawings:
 - 1. Indicate:
 - a. Formwork, shoring, and reshoring.
 - b. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
 - c. Means of leakage prevention for concrete exposed to view in finished construction.
 - d. Sequence and timing of erection and stripping assumed compressive strength at time of stripping, height of lift, and height of drop during placement.
 - e. Vertical, horizontal, and special loads according to ACI 347, and camber diagrams when applicable.
 - f. Notes to formwork erector showing size and location of conduits and piping embedded in concrete according to ACI 318.
 - g. Procedure and schedule for removal of shores and installation and removal of reshores.
 - h. Shop drawings shall be provided for all PVC and TPE waterstops and shall show the location of all factory and field joints, and the equipment and written procedures for making field joints. Procedures shall include temperature setting, cleaning, and other recommended joining techniques.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Perform Work according to ACI 347.
- B. For wood products furnished for Work of this Section, comply with AF&PA.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept void forms on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Design, engineer, and construct formwork, shoring, and bracing according to ACI 318 to conform to design and applicable code requirements to achieve concrete shape, line, and dimension as indicated on Drawings.

2.2 WOOD FORM MATERIALS

- A. Softwood Plywood: Comply with APA/EWA PS 1, exterior BB (Concrete form) Class 1 plywood.
- B. Plywood Forms:
 - 1. Application: Exposed finish concrete.
 - 2. Description:
 - a. Comply with APA/EWA PS 1.
 - b. Panels: Full size, 4 by 8 feet.
 - c. Label each panel with grade trademark of APA/EWA.
 - 3. Plywood for Surfaces to Receive Membrane Waterproofing:
 - a. Minimum Thickness: 5/8 inch.
 - b. Grade: APA/EWA "B-B Plyform Structural I Exterior."
 - 4. Plywood with "Smooth Finish" Indicated on Drawings:
 - a. Minimum Thickness: 3/4 inch.
 - b. Grade: APA/EWA "HD Overlay Plyform Structural I Exterior."

2.3 PREFABRICATED FORMS

- A. Manufacturers:
 - 1. EFCO.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Preformed Steel Forms:
 - 1. Description: Matched, tightly fitted, and stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
 - 2. Minimum Thickness: 16 gage.
- C. FRP Forms: Matched, tightly fitted, and stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.
- D. Tubular Column:
 - 1. Description: Round spirally wound laminated fiber.
 - 2. Surface Treatment: Release agent, non-reusable.
 - 3. Sizes: As indicated on Drawings.
 - 4. Manufacturers:
 - a. Sonotube.
 - b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- E. Steel Forms:
 - 1. Description: Sheet steel, suitably reinforced.
 - 2. Design: For particular use as indicated on Drawings.
- F. Form Liners: Smooth, durable, grainless, and non-staining hardboard unless otherwise indicated on Drawings.
- G. Framing, Studding, and Bracing: Stud.

2.4 FORMWORK ACCESSORIES

- A. Form Ties:
 - 1. Type: Snap off; cone.
 - 2. Material: Galvanized.
 - 3. Furnish waterproofing washer integral waterstop.
 - 4. Manufacturers:
 - a. Dayton Superior.
 - b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.

- c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Spreaders:
1. Description: Standard, non-corrosive metal-form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face.
 2. Wire ties, wood spreaders, or through bolts are not permitted.
- C. Form Release Agent:
1. Description: Colorless mineral oil that will not stain concrete or absorb moisture or impair natural bonding or color characteristics of coating intended for use on concrete.
- D. Corners:
1. Type: Chamfer.
 2. Lengths: Maximum possible.
- E. Preformed Joint Filler Bituminous Joint Filler: Comply with ASTM D1751.
- F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength, and character to maintain formwork in place while placing concrete.
- G. Water Stop:
1. Material: TPV.
 2. Tensile Strength: Minimum 1,750 psi.
 3. Working Temperature Range: Minus 50 to plus 175 degrees F.
 4. Width: 6 inches.
 5. Lengths: Maximum possible.
 6. Profile: Ribbed centerbulb, 7/8" min OD, with eyelets and hog rings.
 7. Corner Sections and Other Intersections: Preformed or factory welded.
 8. Jointing: Heat welded.
 9. Manufacturers:
 - a. JP Specialties.
 - b. Vinylex.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- H. Pre-Formed Water Stop:
1. Description: Flexible strip of modified chloroprene rubber for joints in concrete construction.
 2. Manufacturers:
 - a. Sika.
 - b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.

- c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels, and centers before proceeding with formwork.
- B. Verify that dimensions agree with Drawings.
- C. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Engineer before proceeding.

3.2 INSTALLATION

A. Formwork:

1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
3. Camber forms where necessary to produce level finished soffits unless indicated otherwise on Drawings.
4. Positioning:
 - a. Carefully verify horizontal and vertical positions of forms.
 - b. Correct misaligned or misplaced forms before placing concrete.
5. Complete wedging and bracing before placing concrete.
6. Erect formwork, shoring, and bracing to achieve design requirements according to ACI 301.
7. Stripping:
 - a. Arrange and assemble formwork to permit dismantling and stripping.
 - b. Do not damage concrete during stripping.
 - c. Permit removal of remaining principal shores.
8. Obtain approval of Engineer before framing openings in structural members not indicated on Drawings.
9. Install chamfer strips on external corners.
10. Do not patch formwork.
11. Leave forms in place for minimum number of days according to ACI 347.

- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

C. Form Removal:

1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads, and removal has been approved by Engineer.
2. Loosen forms carefully; do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
3. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged.
4. Discard damaged forms.
5. Form Release Agent:
 - a. Apply according to manufacturer instructions.
 - b. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
 - c. Do not apply form release agent if concrete surfaces are indicated to receive special finishes or applied coverings that may be affected by agent.
 - d. Soak inside surfaces of untreated forms with clean water, and keep surfaces coated prior to placement of concrete.
6. Form Cleaning:
 - a. Clean forms as erection proceeds to remove foreign matter within forms.
 - b. Clean formed cavities of debris prior to placing concrete.
 - c. Flush with water or use compressed air to remove remaining foreign matter.
 - d. Ensure that water and debris drain to exterior through cleanout ports.
 - e. Cold Weather:
 - 1) During cold weather, remove ice and snow from within forms.
 - 2) Do not use de-icing salts.
 - 3) Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure; use compressed air or other dry method to remove foreign matter.
7. Reuse and Coating of Forms:
 - a. Thoroughly clean forms and reapply form coating before each reuse.
 - b. For exposed Work, do not reuse forms with damaged faces or edges.
 - c. Apply form coating to forms according to manufacturer instructions.
 - d. Do not coat forms for concrete indicated to receive "scored finish."
 - e. Apply form coatings before placing reinforcing steel.

D. Forms for Smooth Finish Concrete:

1. Use steel, plywood, or lined-board forms.
2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
3. Install form lining with close-fitting square joints between separate sheets without springing into place.
4. Use full-sized sheets of form liners and plywood wherever possible.
5. Tape joints to prevent protrusions in concrete.
6. Apply forming and strip wood forms in a manner to protect corners and edges.
7. Level and continue horizontal joints.
8. Keep wood forms wet until stripped.

- E. Forms for Surfaces to Receive Membrane Waterproofing:
 - 1. Use plywood or steel forms.
 - 2. After erection of forms, tape form joints to prevent protrusions in concrete.
- F. Framing, Studding, and Bracing:
 - 1. Maximum Spacing of Studs:
 - a. Boards: Maximum 16 inches o.c.
 - b. Plywood: 12 inches o.c.
 - 2. Size framing, bracing, centering, and supporting members for sufficient strength to maintain shape and position under imposed loads from construction operations.
 - 3. Construct beam soffits of material minimum 2 inches thick.
 - 4. Distribute bracing loads over base area on which bracing is erected.
 - 5. When placed on ground, protect against undermining, settlement, and accidental impact.
- G. Form Anchors and Hangers:
 - 1. Do not use anchors and hangers leaving exposed metal at concrete surface.
 - 2. Symmetrically arrange hangers supporting forms from structural-steel members to minimize twisting or rotation of member.
 - 3. Penetration of structural-steel members is not permitted.
- H. Inserts, Embedded Parts, and Openings:
 - 1. Install formed openings for items to be embedded in or passing through concrete Work.
 - 2. Locate and set in place items required to be cast directly into concrete.
 - 3. Install accessories straight, level, and plumb, and ensure that items are not disturbed during concrete placement.
 - 4. Joints:
 - a. Install water stops continuous without displacing reinforcement.
 - b. Heat-seal joints watertight.
 - 5. Openings:
 - a. Provide temporary ports or openings in formwork as required to facilitate cleaning and inspection.
 - b. Locate openings at bottom of forms to allow flushing water to drain.
 - 6. Close temporary openings with tight-fitting panels, flush with inside face of forms, and neatly fitted such that joints will not be apparent in exposed concrete surfaces.
- I. Form Ties:
 - 1. Provide sufficient strength and quantity to prevent spreading of forms.
 - 2. Place ties at least 1 inch away from finished surface of concrete.
 - 3. Leave inner rods in concrete when forms are stripped.

4. Space form ties equidistant, symmetrical, and aligned vertically and horizontally unless indicated otherwise on Drawings.
- J. Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- K. Construction Joints:
1. Install surfaced pouring strip where construction joints intersect on exposed surfaces to provide straight line at joints.
 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
 3. Appearance:
 - a. Show no overlapping of construction joints.
 - b. Construct joints to present same appearance as butted plywood joints.
 4. Arrange joints in continuous line straight, true, and sharp.
- L. Embedded Items:
1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
 2. Do not embed wood or uncoated aluminum in concrete.
 3. Obtain installation and setting information for embedded items furnished under other Sections.
 4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
 5. Ensure that conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 regarding size and location limitations.
- M. Openings for Items Passing through Concrete:
1. Frame openings in concrete where indicated on Drawings.
 2. Establish exact locations, sizes, and other conditions required for openings and attachment of Work specified under other Sections.
 3. Coordinate Work to avoid cutting and patching of concrete after placement.
 4. Perform cutting and repairing of concrete required as result of failure to provide required openings.
- N. Screeds:
1. Set screeds and establish levels for tops of and finish on concrete slabs.
 2. Slope slabs to drain where required or as indicated on Drawings.
 3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms; remove freestanding water.
- O. Screenshot Supports:
1. For concrete over waterproof membranes and vapor retarder membranes, use cradle-, pad-, or base-type screed supports that will not puncture membrane.

2. Staking through membrane is not permitted.

P. Cleanouts and Access Panels:

1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris, and waste material.
2. Clean forms and surfaces against which concrete is to be placed.
3. Remove chips, sawdust, and other debris.
4. Thoroughly blow out forms with compressed air just before concrete is placed.

3.3 TOLERANCES

- A. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Construct formwork to maintain tolerances according to ACI 301.

3.4 FIELD QUALITY CONTROL

A. Inspection:

1. Inspect erected formwork, shoring, and bracing to ensure that Work complies with formwork design and that supports, fastenings, wedges, ties, and items are secure.
2. Notify Engineer after placement of reinforcing steel in forms but prior to placing concrete.
3. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforcing bars.
2. Welded wire fabric.
3. Reinforcement accessories.

B. Related Requirements:

1. Section 031000 - Concrete Forming and Accessories: Form materials, waterstops, and accessories required to form cast-in-place concrete.
2. Section 033000 - Cast-in-Place Concrete: Cast-in-place or in-situ concrete for structural building frame, slabs on grade, and other concrete components associated with building.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
4. ACI SP-66 - ACI Detailing Manual.

C. American Welding Society:

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

D. ASTM International:

1. ASTM A184 - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement.
2. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
3. ASTM A704 - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.

4. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
5. ASTM A767 - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
6. ASTM A775 - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
7. ASTM A884 - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
8. ASTM A934 - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
9. ASTM A996 - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
10. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

E. Concrete Reinforcing Steel Institute:

1. CRSI 10-MSP - Manual of Standard Practice.
2. CRSI 10-PLACE - Placing Reinforcing Bars.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work of this Section with placement of formwork, formed openings, and other Work.

1.5 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.
- B. Convene minimum one week prior to commencing Work of this Section.

1.6 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Shop Drawings:
 1. Indicate bar sizes, spacings, locations, splice locations, and quantities of reinforcing steel.
 2. Indicate bending and cutting schedules.
 3. Indicate supporting and spacing devices.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Submit certified copies of mill test report of reinforcement materials analysis.

- F. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.
- G. Qualifications Statement:
 - 1. Welders: Qualify procedures and personnel according to AWS D1.1.

1.7 QUALITY ASSURANCE

- A. Perform Work according to ACI 301.
- B. Prepare Shop Drawings according to ACI SP-66.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.9 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel:
 - 1. Comply with ASTM A615.
 - 2. Yield Strength: 60 ksi.
 - 3. Billet Bars: Deformed.
 - 4. Finish: Uncoated.

2.2 FABRICATION

- A. Fabricate concrete reinforcement according to ACI 318.
- B. Form standard hooks for 180-degree bends, 90-degree bends, stirrups and tie hooks, and seismic hooks as indicated on Drawings.
- C. Form reinforcement bends with minimum diameters according to ACI 318.
- D. Fabricate column reinforcement with offset bends at reinforcement splices.
- E. Form spiral column reinforcement from minimum 3/8-inch-diameter continuous deformed bar.
- F. Form ties and stirrups from following:
 - 1. Bars No. 10 and Smaller: No. 3 deformed bars.
 - 2. Bars No. 11 and Larger: No. 4 deformed bars.
- G. Splicing:
 - 1. If not indicated on Drawings, locate reinforcement splices at point of minimum stress.
 - 2. Obtain approval of splice locations from Engineer.

2.3 ACCESSORY MATERIALS

- A. Tie Wire:
 - 1. Minimum 16 gage, annealed type.
- B. Chairs, Bolsters, Bar Supports, and Spacers:
 - 1. Size and Shape: To strengthen and support reinforcement during concrete placement conditions.
 - 2. Furnish load-bearing pad on bottom to prevent vapor retarder puncture.
- C. Special Chairs, Bolsters, Bar Supports, and Spacers Adjacent to Weather-Exposed Concrete Surfaces:
 - 1. Material: Plastic-coated steel.
 - 2. Size and Shape: To meet Project conditions.
- D. Reinforcing Splicing Devices:
 - 1. Type: Mechanical set screw; full tension and compression.
 - 2. Size: To fit joined reinforcing.
 - 3. Manufacturers:
 - a. Dayton Superior.
 - b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.

- c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Place, support, and secure reinforcement against displacement.
- B. At the time concrete is placed, reinforcement shall be clean of ice, mud, oil, and other deleterious coatings. A light coating of rust shall be permitted.
- C. Field bending of reinforcement partially embedded in concrete shall not be permitted.
- D. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- E. Do not deviate from required position beyond specified tolerance.
- F. Do not weld crossing reinforcement bars for assembly.
- G. Do not displace or damage vapor retarder.
- H. Accommodate placement of formed openings.
- I. Spacing:
 - 1. Space reinforcement bars with minimum clear spacing according to ACI 318.
 - 2. If bars are indicated in multiple layers, place upper bars directly above lower bars.
- J. Maintain minimum concrete cover around reinforcement according to ACI 318 as follows:
 - 1. Footings and Concrete Formed against Earth: 3 inches.
 - 2. Concrete Exposed to Earth or Weather:
 - a. No. 6 Bars and Larger: 2 inches.
 - b. No. 5 Bars and Smaller: 1-1/2 inches.
 - 3. Supported Slabs, Walls, and Joists:
 - a. No. 14 Bars and Larger: 1-1/2 inches.
 - b. No. 11 Bars and Smaller: 3/4 inch.
 - 4. Beams and Columns: 1-1/2 inches.
 - 5. Shell and Folded Plate Members:
 - a. No. 6 Bars and Larger: 3/4 inch.
 - b. No. 5 Bars and Smaller: 1/2 inch.

- K. Bond and ground reinforcement as specified in Section 260526 - Grounding and Bonding for Electrical Systems.

3.2 TOLERANCES

- A. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Install reinforcement within following tolerances for flexural members, walls, and compression members:
 - 1. Reinforcement Depth Greater Than 8 Inches:
 - a. Depth Tolerance: Plus or Minus 1/2 inch.
 - b. Concrete Cover Tolerance: Minus 1/2 inch.
 - 2. Reinforcement Depth Less Than or Equal to 8 Inches:
 - a. Depth Tolerance: Plus or Minus 3/8 inch.
 - b. Concrete Cover Tolerance: Minus 3/8 inch.
- C. Foundation Walls: Install reinforcement within tolerances according to ACI 530/530.1.

3.3 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed by Owner's testing laboratory according to the California Building Code.
- B. Provide unrestricted access to Work and cooperate with appointed inspection and testing firm.
- C. Reinforcement Inspection:
 - 1. Placement Acceptance: Inspect specified and ACI 318 material requirements and specified placement tolerances.
 - 2. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete for the following items:

1. Retaining walls.
2. Foundation walls.
3. Footings.
4. Supported slabs.
5. Slabs on grade.
6. Control, expansion, and contraction joint devices.
7. Equipment pads.
8. Light pole base.
9. Ring walls for water tanks.

B. Related Requirements:

1. Section 031000 - Concrete Forming and Accessories: Formwork and accessories, placement of joint devices in formwork, and placement of joint device anchors in formwork.
2. Section 032000 - Concrete Reinforcing: Requirements for reinforcing steel and supports.
3. Section 033900 - Concrete curing.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 305R - Guide to Hot Weather Concreting.
3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
4. ACI 308.1 - Specification for Curing Concrete.
5. ACI 318 - Building Code Requirements for Structural Concrete.

C. ASTM International:

1. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.

2. ASTM C33 - Standard Specification for Concrete Aggregates.
3. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
5. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
6. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete.
7. ASTM C150 - Standard Specification for Portland Cement.
8. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
9. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
13. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
14. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
15. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
16. ASTM C685 - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.
17. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
18. ASTM C989 - Standard Specification for Slag Cement for Use in Concrete and Mortars.
19. ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
20. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
21. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
22. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete.
23. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
24. ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
25. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
26. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
27. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
28. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
29. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
30. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
31. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
32. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
33. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

1.5 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Reports and certifications on proposed materials and mixture proportions for each concrete mixture design shall be submitted prior to conducting the laboratory trial batches for proposed mix designs where applicable.
- C. Aggregate Reports (ASTM C 33): Fine aggregate (source and type, gradation, deleterious materials, specific gravity, sand equivalent); coarse aggregate (source and type, gradation, deleterious materials, abrasion loss, specific gravity); and combined aggregate gradation.
 - 1. Aggregate reports shall be project specific and shall be no more than two years old at time of submittal.
 - 2. Aggregates shall be sampled and tested in accordance with ASTM C 33. In addition, the bulk specific gravity of each aggregate shall be determined in accordance with ASTM C 127 and ASTM C 128.
 - 3. Alkali-aggregate reactivity potential shall be determined by one of the following procedures:
 - a. Test fine and coarse aggregates in accordance with ASTM C 1260. Aggregates which do not indicate a potential for alkali reactivity may be used without further testing. Aggregates which indicate a potential for alkali reactivity shall be further tested in accordance with ASTM C 1105 or C 1293 (as appropriate), using a cement containing less than 0.6 percent alkalis.
 - b. Test a project-specific mixture, which includes all aggregates and cementitious materials selected for the project, in accordance with ASTM C 1567. This test may only be used for mixtures that contain slag cement or fly ash, and those products shall not have an alkali content greater than 4.0 percent sodium oxide equivalent. Combinations of cementitious materials and aggregates which do not indicate a potential for alkali reactivity may be used without further testing. Mixture combinations which indicate a potential for alkali reactivity shall have the ingredients and/or proportions modified and then the test shall be repeated.
 - 4. At the discretion of the Engineer, testing in addition to that indicated herein or in Appendix X1 of ASTM C33 may be required on potentially reactive aggregates. Nonreactive aggregates shall be imported if, in the opinion of the Engineer, local aggregates exhibit unacceptable potential reactivity.
- D. Cement: Contractor shall submit certified copies of supplier's (source) test reports showing chemical composition and physical analysis for each shipment used and certifying that the cement complies with ASTM C 150 and these Specifications. The certificate shall be signed by the cement manufacturer.

- E. Cementitious Materials: Type, data sheet, and test report (fly ash, pozzolan, slag cement).
- F. Admixtures: Data sheets and certifications for all admixtures required or proposed (e.g. water reducers, set retarders, plasticizers, activators, air entrainment agents, bond preventers, bonding compounds, etc.) with manufacturer's approval letters.
- G. Mixture Proportions: Provide all proposed mix design(s) to be used for Project per ACI 318. Three point curves are required; compressive strength at 7 and 28 days; mixture proportions report (slump; water content; air content; water-cementitious materials ratio; brand, type, composition, and quantity of cement; brand, type, composition, and quantity of fly ash; specific gravity of each aggregate; ratio of fine to total aggregates; temperature; unit weight; time of initial set at 70°F and 90°F). Lab testing and reports must have been produced within the past two years; otherwise, trial batching and lab testing must be performed for proposed mix designs.
- H. Water analysis test for mixing water and ice including total chlorides and sulfates (as SO₄).
- I. Submit data describing the equipment to be used for proportioning, mixing, and transporting concrete. In the case of ready-mixed concrete, certification that the ready-mix plant complies with the requirements of ASTM C94 will be acceptable. Identify plant location from which concrete will be supplied, plant capacity, and estimated travel time from plant(s) to work site.
- J. For structures with multiple placements, submit placement sequence and construction joints. Joint locations are subject to approval of the Engineer.
- K. Provide reinforcing steel fabrication and placement drawings and bar lists. The bar lists and drawings shall include a reference to the structure in which the reinforcement will be installed and to the Drawing showing the reinforcement. Shop drawings shall include bar lengths, diameters, and bend and splice locations/dimensions.
- L. Submit the following as specified elsewhere in this section:
 - 1. Certified test reports.
 - 2. Mill certs for reinforcing steel.
 - 3. Manufacturers' Certificates of Compliance, which includes copies of independent test results confirming compliance with specified requirements, shall be submitted for (when used): cement, admixtures, fly ash, slag cement, form coatings, form ties, mechanical connections, membrane curing compound, floor sealer and epoxy bonding agent.
 - 4. Mixture designs and independent testing laboratory test results (minimum of 10 tests).
 - 5. Batch tickets.
 - 6. Field quality control reports.
- M. Submit Product Data and manufacturer's installation instructions for curing materials, joint materials, bonding materials, repair materials, admixtures, steel fibers, sealers and hardeners.
- N. Submit procedures for hot and cold weather concreting when such conditions are anticipated.
- O. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.6 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of embedded utilities and components concealed from view in finished construction.

1.7 STORAGE AND HANDLING

- A. Cement, slag cement, and fly ash shall be stored in suitable moisture-proof enclosures. Cement, slag cement, and fly ash, which have become caked or lumpy, shall not be used.
- B. Aggregates shall be stored so that segregation and the inclusion of foreign materials are prevented. The bottom 6 inches of aggregate piles in contact with the ground shall not be used.
- C. Reinforcing steel shall be carefully handled and shall be stored on supports that prevent the steel from touching the ground until inclusion in the Work.

1.8 QUALITY ASSURANCE

- A. Perform Work according to ACI 318.
- B. Comply with ACI 305R when pouring concrete during hot weather.
- C. Comply with ACI 306.1 when pouring concrete during cold weather.
- D. Acquire cement and aggregate from one source for Work.
- E. Perform Work according to California Building Code standards.
- F. Concrete materials shall be selected, and concrete shall be proportioned, batched, mixed, and delivered in a manner that will minimize shrinkage and cracking as specified herein and in accordance with Chapters 3 and 8 of ACI 224R. Concrete temperatures shall be controlled before and until delivery at the end of the delivery truck chute to minimize cracking. Any rise in concrete temperature caused by environmental conditions that will be conducive to excessive shrinkage shall be controlled.

1.9 AMBIENT CONDITIONS

- A. Maintain concrete temperature after installation at minimum 50 degrees F for minimum seven days.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Vapor Retarder Permeance: Maximum 0.04 perms when tested according to ASTM E96, water method.

2.2 MATERIALS

A. Concrete:

1. Cement:

- a. Comply with ASTM C150, Type II - Moderate Sulfate Resistant.
- b. Type: Portland.

2. Normal Weight Aggregates:

- a. Comply with ASTM C33.
- b. Coarse Aggregate Maximum Size: 1½ inches.

3. Water:

- a. Comply with ACI 318.
- b. Potable, without deleterious amounts of chloride ions.

B. Admixtures:

1. Manufacturers:

- a. BASF Corporation.
- b. Euclid Chemical Company.
- c. GCP Applied Technology.
- d. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
- e. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2. Air Entrainment: Comply with ASTM C260.

3. Chemical:

- a. Comply with ASTM C494.
- b. Type A - Water Reducing.
- c. Type B - Retarding.
- d. Type C - Accelerating.
- e. Type D - Water Reducing and Retarding.
- f. Type E - Water Reducing and Accelerating.
- g. Type F - Water Reducing, High Range.
- h. Type G - Water Reducing, High Range, and Retarding.

4. Fly Ash: Comply with ASTM C618, Class F.
5. Plasticizing:
 - a. Comply with ASTM C1017.
 - b. Type I, plasticizing and Type II, plasticizing and retarding.

C. Joint Devices and Filler:

1. Joint Filler, Type A:
 - a. Description: Asphalt-impregnated fiberboard or felt.
 - b. Comply with ASTM D1751.
 - c. Thickness: ½ inch.
 - d. Profile: Tongue-and-groove.
2. Joint Filler, Type C:
 - a. Description: Premolded sponge rubber.
 - b. Comply with ASTM D1752.
 - c. Thickness: ¾ inch.
 - d. Manufacturers:
 - 1) Ceramar, as manufactured by WR Meadows.
 - 2) SR-941, as manufactured by JP Specialties.
 - 3) Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4) Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
3. Removable Cap:
 - a. Description: Removable cap for creating the void for joint sealant.
 - b. Manufacturers:
 - 1) Sealtight Snap Cap, Greenstreak #942 supplied by JP Specialties, Joint Cap supplied by A-Y Supply.
 - 2) Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3) Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
4. Sealant:
 - a. Comply with ASTM D6690.
 - b. Type: I.
 - c. Manufacturers:
 - 1) Vulkem, as manufactured by Tremco.
 - 2) Sikaflex 1a, as manufactured by Sika.
 - 3) Or equal: Refer to the Standard General Conditions and Supplementary Conditions.

- 4) Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2.3 CONCRETE MIX

- A. Select proportions for concrete according to ACI 318 trial mixtures or field test data.
- B. Performance and Design Criteria:
 1. See Section 3.5A herein for Table of Concrete Proportions.
 2. Cement Type: ASTM C150.
 3. Aggregate Type: Normal weight.
 4. Aggregate Size:
 - a. Maximum: 1½ inch.
 5. Maximum Fly Ash Content: 15 percent of cementitious materials by weight.
 6. Concrete mix designs with required compressive strength of 3000 psi or greater shall be stamped and signed by a Civil Engineer licensed in the State of California. Mix designs shall be approved at least 3 days prior to concrete placement.
- C. Admixtures:
 1. Include admixture types and quantities indicated in concrete mix designs only if approved by Engineer.
 2. Cold Weather:
 - a. Use accelerating admixtures in cold weather.
 - b. Use of admixtures will not relax cold-weather placement requirements.
 3. Hot Weather: Use set-retarding admixtures.
- D. Average Compressive Strength Reduction: Not permitted.
- E. Ready-Mixed Concrete: Mix and deliver concrete according to ASTM C94.

2.4 ACCESSORIES

- A. Vapor Retarder:
 1. Manufacturers:
 - a. Fortifiber.
 - b. Raven Industries.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
 2. Description: Fabric-reinforced plastic film.
 3. Comply with ASTM E1745, Class A.

4. Thickness: 15 mils.
5. Type: As recommended for below-grade application.
6. Joint Tape: As recommended by manufacturer.

B. Non-shrink Grout:

1. Manufacturers:
 - a. Euclid Chemical Company.
 - b. Sika Corporation.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Description: Premixed compound consisting of non-metallic aggregate, cement, and water-reducing and plasticizing agents.
3. Comply with ASTM C1107.
4. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify requirements for concrete cover over reinforcement.
- B. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Previously Placed Concrete:
 1. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.
 2. Remove laitance, coatings, and unsound materials.
- C. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels, and pack solid with non-shrink grout.
- D. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- E. Remove water from areas receiving concrete before concrete is placed.

3.3 INSTALLATION

A. Placing Concrete:

1. Place concrete according to ACI 301.
2. Notify testing laboratory and Engineer minimum 48 hours prior to commencement of operations.
3. Ensure that reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.
4. Install vapor retarder under interior slabs on grade according to ASTM E1643.
5. Lap joints minimum 6 inches and seal watertight by taping edges and ends.
6. Repairs:
 - a. Repair vapor retarder damaged during placement of concrete reinforcement.
 - b. Using vapor retarder material, lap over damaged areas minimum 6 inches and seal watertight.
7. Joint Devices:
 - a. Coordination: Install construction joint devices in coordination with floor slab pattern placement sequence; set top to required elevations; secure to resist movement by wet concrete.
8. Deposit concrete at final position, preventing segregation of mix.
9. Place concrete in continuous operation for each panel or section as determined by predetermined joints.
10. Consolidate concrete.
11. Maintain records of concrete placement, including date, location, quantity, air temperature, and test samples taken.
12. Place concrete continuously between predetermined expansion, control, and construction joints.
13. Do not interrupt successive placement and do not permit cold joints to occur.
14. Place floor slabs in indicated checkerboard or saw-cut pattern.
15. Saw-Cut Joints:
 - a. Saw-cut joints within 12 hours after placing.
 - b. Use 3/16-inch-thick blade.
 - c. Cut into 1/4 depth of slab thickness.
16. Screeding:
 - a. Screed floors and slabs on grade level.

B. Concrete Finishing:

1. Provide formed concrete finishes as described herein in 3.5.C Schedule - Concrete Finishes.
2. Finish concrete floor surfaces according to ACI 301.
3. Steel trowel surfaces indicated to be exposed.
4. In areas with floor drains, maintain floor elevation at walls and pitch surfaces uniformly to drains as indicated on Drawings.

C. Curing and Protection:

1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
2. Protect concrete footings from freezing for minimum of five days.
3. Maintain concrete with minimal moisture loss at relatively constant temperature for period as necessary for hydration of cement and hardening of concrete.
4. Cure concrete slabs according to ACI 308.1 using burlene blankets. Concrete walls shall be cured by leaving the forms in place and applying a soaker hose to keep all surfaces wet.
5. Curing concrete shall maintain wetness for seven days.

3.4 FIELD QUALITY CONTROL

A. Inspection and Testing: Furnished and paid for by Owner according to ACI 318 and California Building Code.

B. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.

C. Concrete Inspections:

1. Continuous Placement Inspection: Inspect for proper installation procedures.
2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.

D. Strength Test Samples:

1. Sampling Procedures: Comply with ASTM C172.
2. Cylinder Molding and Curing Procedures:
 - a. Comply with ASTM C31.
 - b. Cylinder Specimens: Standard cured.
3. Sample concrete and make one set of three 6x12 or four 4x8 cylinders for every 150 cu. yd. or less of each class of concrete placed each day, and for every 5,000 sq. ft. of surface area for slabs and walls.
4. If volume of concrete for a class of concrete would provide less than five sets of cylinders, take samples from five randomly selected batches, or from every batch if less than five batches are used.
5. Make one additional cylinder during cold weather concreting and field cure.

E. Field Testing:

1. Slump Test Method: Comply with ASTM C143.
2. Air Content Test Method: Comply with ASTM C173 or ASTM C231.
3. Temperature Test Method: Comply with ASTM C1064.
4. Compressive Strength Concrete:
 - a. Measure slump and temperature for each sample.
 - b. Measure air content in air-entrained concrete for each sample.

F. Cylinder Compressive Strength Testing:

1. Test Method: Comply with ASTM C39.
2. Test Acceptance: According to ACI 318.
3. Test one cylinder at seven days.
4. Test two 6x12 or three 4x8 cylinders at 28 days.
5. Retain one cylinder for testing when requested by Engineer.
6. Dispose of remaining cylinders if testing is not required.

G. Core Compressive Strength Testing:

1. Sampling and Testing Procedures: Comply with ASTM C42.
2. Test Acceptance: According to ACI 318.
3. Drill three cores for each failed strength test from failed concrete.

H. Patching:

1. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
2. Honeycombing or Embedded Debris in Concrete:
 - a. Not acceptable.
 - b. Notify Engineer upon discovery.
3. Patch imperfections as directed by Engineer and according to ACI 301 and ACI 318.

I. Defective Concrete:

1. Description: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.
2. Repair or replacement of defective concrete will be determined by Engineer.
3. Do not patch, fill, touch up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

3.5 ATTACHMENTS

A. Table of Concrete Proportions.

End use of Concrete	Tests ⁽⁵⁾	Min Sacks of Cement per C.Y. ⁽¹⁾	Min 28-day Compression Strength PSI	Max W/C Ratio by Weight ⁽²⁾	Total Air Content ⁽³⁾	Slump	WRDA	Super Plasticizer
Lean concrete fill	---	2.5	---	---	---	4-6	---	---
Building footings, retaining walls, equipment pads, and walkways	---	5.5	3000	.50	4%-6%	3-5	Yes	---
Tank and filter foundations, pre-cast wet well base and top	B, C	6.5	4500	.45	4%-6%	4-6	Yes	---

Notes:

1. A sack of cement weighs 94 pounds. Cement contents may be reduced by 1/4 sack for concrete containing 1½-inch coarse aggregates.
2. The W/C ratio is the weight of water divided by the weight of cement plus pozzolan. At the job site when the slump is less than required for proper placement, water may be added to the mix. The measurement of the slump and determination for the need of additional water shall be made as soon as possible after the truck arrival. Add water shall not exceed 2 gallons per cubic yard of concrete. Insufficient slump after the maximum addition of add water shall be cause for rejection. At any time, if the slump is excessive the concrete is subject to rejection by the Engineer.
3. The total air content is measured in the concrete as deposited in the forms. The air content shall be achieved solely by the addition of an air entraining admixture (AEA).
4. The following list of admixtures and dosages shall be supplied for the Tremie concrete: BASF Master Glenium 7511, 4-8 oz./CWT cement (WRDA); BASF Master Matrix VW 450, 10 oz./CWT cement (ANTI-WASHOUT). The accelerator and anti-washout shall be added at the job site.
5. Testing:
 - a. is three 6x12 or four 4x8 test cylinders for each 150 yards or less of concrete per day;
 - b. is three 6x12 or four 4x8 cylinders for each 100 yards or less of concrete per day;
 - c. is slump, temperature, and air content of the first truck; from all trucks in which the concrete seems to vary from the acceptable mix; and from the trucks from which the test cylinders are taken.

B. Grading of combined fine and coarse aggregates.

1. Grading of combined fine and coarse aggregates shall fall within the following limits:

Sieve Number or Size in inches	Percentage Passing by Weight	
	One and one-half inch maximum	One-inch maximum
Passing a 2-inch	---	---
Passing a 1½-inch	90 - 100	---
Passing a 1-inch	50 - 86	90 - 100
Passing a ¾-inch	45 - 75	55 - 100
Passing a ⅝-inch	38 - 55	45 - 75
Passing a No. 4	30 - 45	35 - 60
Passing a No. 8	23 - 38	27 - 45
Passing a No. 16	1 - 33	20 - 35
Passing a No. 30	10 - 22	12 - 25
Passing a No. 50	4 - 10	5 - 15
Passing a No. 100	1 - 6	1 - 8
Passing a No. 200	0 - 3	0 - 4

C. Schedule - Concrete Finishes:

1. Formed concrete finishes:

- a. All formed concrete surfaces shall be finished with the applicable finish system described below. The Class C Finish applies to all buried surfaces that are designated to receive a waterproofing or damp-proofing system. The Class B Finish applied to all formed surfaces not receiving a Rough Finish or a Class C Finish.

1) Rough Finish:

- a) Is applicable to all non-waterproofed/damp-proofed buried surfaces. The finish system shall consist of plugging all tie-bolt holes, snap-tie cone depressions, and other surface defects deeper than 2 inches. Mortar fins protruding more than ¼ inch shall be removed. Plugging shall be performed with Cement Mortar on thoroughly saturated concrete or with a proprietary product intended for that purpose that is reviewed and approved by the Engineer.

2) Class C Finish:

- a) Shall consist of patching all tie-bolt holes, snap-tie cone depressions, and other surface defects deeper than 1/8-inch with Cement Mortar. Mortar fins protruding more than 1/16-inch shall be removed except that all mortar fins shall be ground flush with the surrounding surface when it is designed to receive a Waterproof Membrane.

- 3) Class B Finish:
 - a) Shall consist of patching all tie-bolt holes, snap-tie cone depressions, and other surface defects deeper than 1/16-inch or having a dimension larger than 1-inch with Cement Mortar. Mortar fins and other protrusions shall be removed flush with the surface and ground smooth. In addition, the surface shall have a uniform pattern, color and texture. If necessary, the surface shall be Sack Rubbed. The need for and extent of the Sack Rubbed Finish shall be determined by the Engineer upon removal of the forms. The Sack Rubbed Finish shall provide a uniform appearance over the entire surface.
- 4) Cement Mortar:
 - a) For plugging holes and other depressions shall be composed of one-part mortar sand to one-part Type I or Type II Portland Cement and sufficient water to produce a damp cohesive formable mixture. The surface receiving the Cement Mortar shall be thoroughly saturated, damp, and pre-coated with a wet cement slurry just prior to applying the Cement Mortar. In layers not exceeding 1-inch in thickness, the Cement Mortar shall be densely packed into the depression using a smooth faced hammer. Wet curing for three days of the Cement Mortar with burlene or burlap shall proceed the installation unless the plugged area will immediately receive a Sack Rubbed Finish.
- 5) Sack Rubbed Finish:
 - a) Shall be performed as soon as the forms are stripped while the concrete is clean and thoroughly saturated. If performed at a later time the concrete shall be scrubbed and pressure washed clean and soaked with water for three days until the surface is thoroughly saturated prior to sack rubbing.
 - b) Shall consist of applying a two-part cement to one-part fine mortar sand paste to the designated surface and scrubbing the paste into the wall with a burlap sack, rubber float or other device that will produce a uniform texture with the thin layer of paste.
 - c) Shall be wet cured with burlene for three days immediately after it has been applied.

END OF SECTION 033000

SECTION 033900 - CONCRETE CURING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Initial and final curing of horizontal and vertical concrete surfaces.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: Manufacturer's information on curing compounds, mats, paper, and film, including compatibilities and limitations.
- C. Manufacturer's Certificate: Products meet or exceed specified requirements.
- D. Manufacturer Instructions: Installation requirements, including storage and handling procedures.

1.4 QUALITY ASSURANCE

- A. Perform Work according to ACI 308.1.
- B. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Store materials according to manufacturer instructions.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Absorptive Mats, Burlene:

1. Description:

- a. Material: Burlap-polyethylene (PE).
- b. Minimum Weight: 10 oz./sq. yd.
- c. Bonded to prevent separation during handling and placing.

2. Comply with ASTM C171.

3. Manufacturers:

- a. Max Katz Bag Co.
- b. Midwest Canvas.
- c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
- d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are ready to be cured.

3.2 APPLICATION

A. Horizontal Surfaces:

1. Absorptive Mat:

- a. Saturate burlap-PE and place burlap-side down over floor slab areas.
- b. Lap ends and sides.
- c. Maintain in place for 7 days.

B. Vertical Surfaces:

1. Comply with ACI 308.1, using soaker hose method; leave forms in place and keep all surfaces wet.
2. Spraying: Spray water over surfaces and maintain wet for 7 days.

3.3 PROTECTION

- A. Do not permit traffic over unprotected floor surfaces.

END OF SECTION 033900

SECTION 036000 - GROUTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Portland cement grout.
 - 2. Nonshrink cementitious grout.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Manufacturer's Certificate: Products meet or exceed specified requirements.
- C. Manufacturer Instructions: Mixing, handling, surface preparation, and placing epoxy-type and nonshrink grouts.
- D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.4 QUALITY ASSURANCE

- A. Perform Work according to industry standards.
- B. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Store materials according to manufacturer instructions.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.6 AMBIENT CONDITIONS

- A. Maximum Conditions: Do not perform grouting if temperatures exceed manufacturer's recommendations; comply with ACI 360R where applicable.
- B. Minimum Conditions: Maintain minimum temperature per manufacturer's recommendations before, during, and after grouting, until grout has set; comply with ACI 360R where applicable.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT GROUT

- A. Portland Cement: Comply with ASTM C150, Type I and II.
- B. Water:
 - 1. Potable.
 - 2. No impurities, suspended particles, algae, or dissolved natural salts in quantities capable of causing:
 - a. Corrosion of steel.
 - b. Volume change increasing shrinkage cracking.
 - c. Efflorescence.
 - d. Excess air entraining.
- C. Fine Aggregate:
 - 1. Washed natural sand.
 - 2. Gradation:
 - a. Comply with ASTM C33.
 - b. Represented by smooth granulometric curve within required limits.
 - 3. Free from injurious amounts of organic impurities according to ASTM C40.
- D. Mix:
 - 1. Portland cement, sand, and water.
 - 2. Do not use ferrous aggregate or staining ingredients in grout mixes.

2.2 NONSHRINK CEMENTITIOUS GROUT

- A. Manufacturers:
 - 1. Euclid.
 - 2. Quikcrete.
 - 3. Sika Corporation.
 - 4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Pre-mixed and ready-for-use formulation requiring only addition of water.
2. Nonshrink, non-corrosive, nonmetallic, non-gas forming, and no chlorides.

C. Performance and Design Criteria:

1. Certified to maintain initial placement volume or expand after set, and to meet following minimum properties when tested according to CRD-C621 for Type D nonshrink grout:
 - a. Setting Time:
 - 1) Initial: Approximately two hours.
 - 2) Final: Approximately three hours.
 - 3) Comply with ASTM C191.
 - b. Maximum Expansion: 0.01 to 0.05 percent.
 - c. Compressive Strength:
 - 1) Three-Day: 3,500 psi to 4,500 psi.
 - 2) Seven-Day: 5,000 psi to 6,000 psi.
 - 3) 28-Day: 6,800 psi to 8,500 psi.
 - 4) Comply with CRD-C621.

2.3 FORMWORK

- A. As specified in Section 031000 - Concrete Forming and Accessories.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify areas to receive grout.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Remove defective concrete, laitance, dirt, oil, grease, and other foreign material from concrete surfaces by brushing, hammering, chipping, or other similar means until sound and clean concrete surface is achieved.
- C. Roughen concrete lightly, but not to interfere with placement of grout.
- D. Remove foreign materials from metal surfaces in contact with grout.

- E. Align, level, and maintain final positioning of components to be grouted.
- F. Saturate concrete surfaces with clean water, and then remove excess water.

3.3 INSTALLATION

A. Formwork:

- 1. Construct leakproof forms anchored and shored to withstand grout pressures.
- 2. Install formwork with clearances to permit proper placement of grout.
- 3. As specified in Section 031000 - Concrete Forming and Accessories.

B. Mixing:

- 1. Portland Cement Grout:
 - a. Use proportions of two parts sand and one-part cement, measured by volume.
 - b. Prepare grout with water to obtain consistency to permit placing and packing.
 - c. Mix only quantities of grout capable of being placed within 30 minutes after mixing.
 - d. Do not add additional water after grout has been mixed.
 - e. Minimum Compressive Strength: 3,500 psi in three days and 6,800 psi in 28 days.
- 2. Nonshrink Cementitious Grout:
 - a. Mix and prepare according to manufacturer instructions.
 - b. Minimum Compressive Strength: 3,500 psi in three days and 6,800 psi in 28 days.

C. Placing of Grout:

- 1. Do not use pneumatic-pressure or dry-packing methods.
- 2. Do not remove leveling shims for at least 48 hours after grout has been placed.

D. Curing:

- 1. Prevent rapid loss of water from grout during first 48 hours by use of approved membrane curing compound or by using wet burlap method.
- 2. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical injury.
- 3. After grout has attained its initial set, keep damp for minimum three days.

- E. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.4 FIELD QUALITY CONTROL

A. Inspection and Testing:

1. Comply with ACI 301 and ACI 318.
2. Submit proposed mix design of each class of grout to Engineer of Record for review prior to commencement of Work.
3. Tests of grout components may be performed to ensure compliance with specified requirements.

END OF SECTION 036000

SECTION 040513 - MASONRY MORTARING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Mortar for masonry.
- B. Related Requirements:
 - 1. Section 040516 - Masonry Grouting.
 - 2. Section 042900 - Engineered Unit Masonry.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.
- B. American Concrete Institute:
 - 1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
- C. ASTM International:
 - 1. ASTM C5 - Standard Specification for Quicklime for Structural Purposes.
 - 2. ASTM C91 - Standard Specification for Masonry Cement.
 - 3. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
 - 4. ASTM C150 - Standard Specification for Portland Cement.
 - 5. ASTM C199 - Standard Test Method for Pier Test for Refractory Mortars.
 - 6. ASTM C206 - Standard Specification for Finishing Hydrated Lime.
 - 7. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
 - 8. ASTM C387 - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar.
 - 9. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
 - 10. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
 - 11. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry.
 - 12. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.
 - 13. ASTM C1329 - Standard Specification for Mortar Cement.
 - 14. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength.

1.4 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Design Data: Submit required environmental conditions, admixture limitations, and design mix if property specification of ASTM C270 is to be used.
- E. Test and Evaluation Reports:
 - 1. Indicate compliance of mortar to requirements of ASTM C270.
- F. Manufacturer Instructions: Submit premixed mortar installation instructions.
- G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.5 QUALITY ASSURANCE

- A. Comply with ACI 530/530.1.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.8 AMBIENT CONDITIONS

- A. Cold Weather Requirements: Comply with ACI 530/530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F.

- B. Hot Weather Requirements: Comply with ACI 530/530.1 if ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 - PRODUCTS

2.1 MORTAR

- A. Manufacturers:
 - 1. Lehigh Hanson; HeidelbergCement Group.
 - 2. QUIKRETE.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2.2 MATERIALS

- A. Portland Cement:
 - 1. Comply with ASTM C150, Type I.
- B. Premix Mortar:
 - 1. Comply with ASTM C387, Type S.
- C. Mortar Aggregate:
 - 1. Comply with ASTM C144.
 - 2. Type: Standard masonry.
- D. Hydrated Lime: Comply with ASTM C206, Type S.
- E. Water: Clean and potable.
- F. Mortar Color:
 - 1. Color: To match block units.
- G. Calcium Chloride: Not allowed.

2.3 MIXES

- A. Mortar Mixes:
 - 1. Mortar for Structural Masonry: Comply with ASTM C270, Type S using proportion specification.

PART 3 - EXECUTION

3.1 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Apply bonding agent to existing concrete surfaces.
- C. Mortar Mixing:
 - 1. Thoroughly mix mortar ingredients according to ASTM C270 in quantities needed for immediate use.
 - 2. Achieve uniformly damp sand immediately before mixing process.
 - 3. Add mortar color and admixtures to achieve uniform mix and coloration.
 - 4. Retemper only within two hours of mixing.

3.2 INSTALLATION

- A. According to ACI 530/530.1.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.3 FIELD QUALITY CONTROL

- A. Establish mortar mix according to ASTM C270.

END OF SECTION 040513

SECTION 040516 - MASONRY GROUTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Grout for masonry.
- B. Related Requirements:
 - 1. Section 040513 - Masonry Mortaring.
 - 2. Section 042900 - Engineered Unit Masonry.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.
- B. American Concrete Institute:
 - 1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
- C. ASTM International:
 - 1. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
 - 2. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete.
 - 3. ASTM C150 - Standard Specification for Portland Cement.
 - 4. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
 - 5. ASTM C476 - Standard Specification for Grout for Masonry.
 - 6. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
 - 7. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - 8. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
 - 9. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
 - 10. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.

1.4 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

- C. Test and Evaluation Reports: Submit compliance with grout property requirements according to ASTM C476, component grout materials according to ASTM C476, and test and evaluation reports according to ASTM C1019.
- D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.5 QUALITY ASSURANCE

- A. Perform Work according to ACI 530/530.1.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.7 AMBIENT CONDITIONS

- A. Cold Weather Requirements: According to ACI 530/530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F.
- B. Hot Weather Requirements: According to ACI 530/530.1 if ambient temperature is greater than 100 degrees F or if ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 - PRODUCTS

2.1 MASONRY GROUT

- A. Manufacturers:
 - 1. Lehigh Hanson; HeidelbergCement Group.
 - 2. QUIKRETE.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2.2 MATERIALS

- A. Portland Cement: Comply with ASTM C150, Type I.
- B. Grout Aggregate: Comply with ASTM C404, fine and coarse.
- C. Water: Clean and potable.
- D. Shrinkage Compensating Admixture:
 - 1. Sika Grout Aid.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- E. Calcium Chloride: Not allowed.

2.3 MIXES

- A. Grout:
 - 1. Grout for Structural Masonry:
 - a. Compressive Strength: 2,000 psi at 28 days.
 - b. Slump: 8 to 11 inches.
 - c. Mixing: According to ASTM C476, fine and coarse.
 - 2. Application:
 - a. Coarse Grout: Grouting spaces with minimum 4-inch dimension in each direction.
 - b. Fine Grout: Grouting other spaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Request inspection of spaces to be grouted.

3.2 INSTALLATION

- A. Mixing:
 - 1. Mix grout according to ASTM C94, as modified to use ingredients complying with ASTM C476.

- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Comply with ACI 530/530.1.

3.3 FIELD QUALITY CONTROL

- A. Testing:
 - 1. Mix: Comply with ASTM C1019 for compressive strength and comply with ASTM C143 for slump.
 - 2. Compressive Strength of Mortar, Grout, and Masonry: Comply with ASTM C1314.

END OF SECTION 040516

SECTION 042900 - ENGINEERED UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.

B. Related Requirements:

1. Section 032000 - Concrete Reinforcing: Product requirements for steel reinforcing in masonry for installation by this Section.
2. Section 040513 - Masonry Mortaring: Requirements for mortar.
3. Section 040516 - Masonry Grouting: Requirements for grout.
4. Section 099000 - Painting and Coating: Field-applied paint finish.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Concrete Institute:

1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
2. 2016 California Building Code (CBC).

C. ASTM International:

1. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
2. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength.
3. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
4. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units.
5. ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
6. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work of this Section with installation of door anchors.
- C. Direct and coordinate placement of metal anchors supplied to other Sections.

1.5 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.
- B. Convene minimum one week prior to commencing Work of this Section.

1.6 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data:
 - 1. Submit manufacturer data for masonry units.
- C. Shop Drawings: Indicate bar sizes, spacings, locations, reinforcement quantities, bending and cutting schedules, supporting and spacing devices for reinforcement, and accessories.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and installer.

1.7 QUALITY ASSURANCE

- A. Perform Work according to ACI 530/530.1.
- B. Structural Tests and Special Inspections: Comply with CBC Section 1705.4 Chapters 17 and 21 and ACI 530 Chapter 3 Table 3.1.3 for special inspections and quality assurance verification testing of compressive strength of each unit masonry wythe using prism test method according to ASTM C1314.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

- B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Storage:
 - 1. Store materials according to manufacturer instructions.
 - 2. Do not store reinforcing material directly on ground.
 - 3. Use blocking and other methods to prevent rust on accessories prior to installation.
- C. Protection:
 - 1. Protect moisture sensitive materials by storing in clean, dry location.

1.10 AMBIENT CONDITIONS

- A. Cold Weather Requirements: Comply with ACI 530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F.
- B. Hot Weather Requirements: Comply with ACI 530.1 if ambient temperature is greater than 100 degrees F, or if ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

1.11 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 REINFORCED UNIT MASONRY

- A. Manufacturers:
 - 1. Basalite.
 - 2. CastleLite.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Concrete Masonry Compressive Strength (f_m):
 - a. 2,000 psi.
 - b. Method: Unit strength.
 - c. Concrete Masonry Units (CMU): 2,000 psi minimum net area compressive strength.

2.2 MATERIALS

A. Hollow Load-Bearing CMU:

1. Comply with ASTM C90.
2. Weight: Light.
3. Design: Precision and split face.
4. Color: Gray.

B. CMU Size and Shape:

1. Nominal Modular Size: 8 by 8 by 16 inches.
2. Furnish special units for 90-degree corners, bond beams, and lintels.

2.3 ACCESSORIES

A. Reinforcing Steel:

1. As specified in Section 032000 - Concrete Reinforcing.

B. Reinforcing Bar Positioners:

1. Description: Cold-drawn 11-gage steel wire, designed to prevent displacement of reinforcing steel and maintain adequate grout coverage within unit masonry cells.
2. Comply with ASTM A153, hot-dip galvanized.
3. Vertical Bars: Fabricated for positioning each vertical bar lap splice.
4. Horizontal Bars: Fabricated for positioning bar at top of bond beams and lintels.

C. Anchor Rods:

1. Description:
 - a. Standard headed, with washers and heavy hex nuts.
2. Comply with ASTM A307.
3. Grade: A (60 yield strength).
4. Finish:
 - a. Hot-Dipped Galvanizing: Comply with ASTM A153.

D. Mortar and Grout:

1. As specified in Section 040513 - Masonry Mortaring and Section 040516 - Masonry Grouting.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and ready to receive Work.
- B. Verify that items provided by other Sections of Work are properly sized and located.
- C. Verify that built-in items are in proper location and ready for roughing into masonry Work.
- D. Masonry Units:
 1. Verify that units are free of cracks, spalling, disfigurements, face chips, or edge chips in excess of 1/4 inch in length or depth.
 2. Clean units free of bond breakers and other foreign substances.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Bracing:
 1. Furnish temporary bracing during installation of masonry Work.
 2. Maintain in place until building structure provides permanent support.

3.3 INSTALLATION

- A. Establish indicated lines, levels, and coursing.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Protect masonry units from displacement.
- D. Maintain masonry courses to uniform dimension.
- E. Form bed and head joints of uniform thickness.
- F. Align exposed exterior faces of masonry flush, allowing block thickness variations to appear on unexposed interior face.

G. Coursing of CMU:

1. Bond: Running.
2. Coursing: One unit and one mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

H. Placing and Bonding:

1. Lay solid masonry units in full bed of mortar with full head joints.
2. Lay hollow masonry units with face shell bedding on head and bed joints.
3. Buttering corners of joints and excessive furrowing of mortar joints are not permitted.
4. Remove excess mortar as Work progresses.
5. Interlock intersections and external corners.
6. Adjustments:
 - a. Do not shift or tap masonry units after mortar has achieved initial set.
 - b. If adjustment is required, remove mortar and replace.
7. Site Cutting:
 - a. Perform Site cutting of masonry units with proper tools to ensure straight, clean, unchipped edges.
 - b. Prevent broken masonry unit corners or edges.

I. Reinforcement and Anchorage:

1. Reinforcing Bars:
 - a. Support and secure reinforcing bars from displacement and maintain position within 1/2 inch of dimensioned position.

J. Grouted Components:

1. Reinforce bond beams and pilasters as indicated on Drawings, maintaining minimum 1-inch clearance from bottom web.
2. Lap splices as indicated on the Drawings.
3. Support and secure reinforcing bars from displacement.
4. Place and consolidate grout fill without displacing reinforcement.

K. Reinforced Masonry:

1. Lay masonry units with cells vertically aligned and cavities clear of mortar and unobstructed.
2. Place reinforcing bars and grout as indicated on Drawings.
3. Splice reinforcement as specified on the Drawings.
4. Support and secure reinforcement from displacement.
5. Place and consolidate grout fill without displacing reinforcing.
6. Place grout according to ACI 530.1.

L. Control Joints:

1. Install control joints at following maximum spacings, unless otherwise indicated on Drawings.
 - a. Exterior Walls: 20 feet o.c. and within 24 inches on one side of each interior and exterior corner.
 - b. Interior Walls: 30 feet o.c.
 - c. At changes in wall height.
2. Do not continue horizontal joint reinforcement through control joints, except where noted on Drawings.

M. Built-In Work:

1. As Work progresses, install built-in metal door frames, window frames, anchor bolts, and other items to be built into Work and furnished by other Sections.
2. Install built-in items plumb and level.
3. Frames:
 - a. Bed anchors of metal door frames in adjacent mortar joints.
 - b. Fill frame voids solid with grout or mortar.
4. Do not build-in materials subject to deterioration.

N. Cutting and Fitting:

1. Cut and fit for pipes, conduit, and sleeves.
2. Coordinate with other Sections of Work to provide correct size, shape, and location.
3. Obtain Engineer's approval prior to cutting or fitting masonry Work not indicated or where appearance or strength of masonry Work may be impaired.

O. Cleanouts at Solid-Grouted, Hollow-Core Masonry:

1. Locate at bottom course of each grout lift at each vertical reinforcing bar with maximum 32 inches o.c. at solid grouted walls for grout pours exceeding 5 feet in height, according to ACI 530.1.
2. Provide cleanout by removing and reinstalling entire face of masonry unit at exterior wall surfaces.
3. Clean grout space prior to grouting to remove mortar droppings, mortar projections larger than 1/2 inch, and other foreign matter.
4. Seal cleanouts after inspection and before grouting.

3.4 TOLERANCES

- A. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Maximum Variation from Alignment of Columns and Pilasters: 1/4-inch.

- C. Maximum Variation from Unit to Adjacent Unit: 1/16-inch.
- D. Maximum Variation from Plane of Wall: 1/4-inch in 10 feet and 1/2-inch in 20 feet or more.
- E. Maximum Variation from Plumb: 1/4-inch per story, noncumulative; 1/2-inch in two stories or more.
- F. Maximum Variation from Level Coursing: 1/8-inch in 3 feet; 1/4-inch in 10 feet; 1/2-inch in 30 feet.
- G. Maximum Variation of Joint Thickness: 1/8-inch in 3 feet.
- H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4-inch.
- I. Maximum Variation for Steel Reinforcement:
 - 1. Install reinforcement within tolerances according to ACI 530.1 for foundation walls.
 - 2. Plus or minus 1/2 inch when distance from centerline of steel to opposite face of masonry is 8 inches or less.
 - 3. Plus or minus 1 inch when distance is between 8 and 24 inches.
 - 4. Plus or minus 1-1/4 inch when distance is greater than 24 inches.
 - 5. Plus or minus 2 inches from location along face of wall.

3.5 FIELD QUALITY CONTROL

- A. Testing:
 - 1. Test each type of CMU according to ASTM C140.
 - 2. Prism Tests: Test compressive strength of completed reinforced masonry according to ASTM C1314.
- B. Acceptance: Cut out damaged and defective Work, reconstruct with new masonry materials, and repoint with mortar.

3.6 CLEANING

- A. Remove excess mortar and mortar smears as Work progresses.
- B. Clean soiled surfaces with cleaning solution; coordinate with Work of specified water repellent or surface coating.
- C. Use non-metallic tools in cleaning operations.

3.7 PROTECTION

- A. Protect exposed external corners subject to damage.
- B. Protect base of walls from mud and mortar splatter.

- C. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- D. Coverings:
 - 1. Protect tops of masonry Work with waterproof coverings secured in place without damaging masonry.
 - 2. Provide coverings if masonry is exposed to weather when Work is not in progress.
 - 3. Maintain protection on tops of completed exterior walls until installation of permanent waterproof cap materials.
- E. Protect Work from rain by performing Work under protective cover.

END OF SECTION 042900

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shop-fabricated metal items.
2. Loose steel lintels.
3. Ledge and shelf angles.
4. Channel door frames.
5. Bollards.
6. Structural supports for miscellaneous attachments.
7. Anchor bolts for sill plates.

B. Related Requirements:

1. Section 033000 - Cast-In-Place Concrete: Execution requirements for embedded anchors and attachments for metal fabrications specified by this Section in concrete.
2. Section 042000 - Unit Masonry: Execution requirements for embedded anchors and attachments for metal fabrications specified by this Section in masonry.
3. Section 099000 - Painting and Coating: Field-applied paint finish.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.
- B. Current edition of AISC Steel Construction Manual and all associated references.
- C. AISC 303 - Code of Standard Practice for Structural Steel Buildings and Bridges.
- D. Aluminum Association:
 1. AA DAF-45 - Designation System for Aluminum Finishes.
- E. American Architectural Manufacturers Association:
 1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
 2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

3. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
4. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

F. American National Standards Institute:

1. ANSI A14.3 - American National Standard (ASC) for Ladders - Fixed - Safety Requirements.

G. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.
3. AWS D1.6 - Structural Welding Code - Stainless Steel.

H. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A53- Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
6. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
7. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
8. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.
9. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
10. ASTM A312 - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
11. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
12. ASTM A354 - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
13. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
14. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
15. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing.
16. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
17. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
18. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

19. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
20. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
21. ASTM A992 - Standard Specification for Structural Steel Shapes.
22. ASTM B26 - Standard Specification for Aluminum-Alloy Sand Castings.
23. ASTM B85 - Standard Specification for Aluminum-Alloy Die Castings.
24. ASTM B177 - Standard Guide for Engineering Chromium Electroplating.
25. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
26. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
27. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire.
28. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
29. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
30. ASTM F436 - Standard Specification for Hardened Steel Washers.
31. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 ksi Yield Strength.

I. Builders Hardware Manufacturers Association (BHMA):

1. ANSI/BHMA A156.20 - American National Standard for Strap and Tee Hinges and Hasps.

J. The “Greenbook” Standard Specifications for Public Works Construction (SS), 2018 Edition.

1. SS 201 - Concrete, Mortar, and Related Materials.

K. National Ornamental & Miscellaneous Metals Association:

1. NOMMA Guideline 1 - Joint Finishes.

L. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.
2. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
3. SSPC Paint 20 - Zinc-Rich Coating (Type I - Inorganic and Type II - Organic).
4. SSPC SP 1 - Solvent Cleaning.
5. SSPC SP 10 - Near-White Blast Cleaning.

1.4 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where

applicable. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.5 QUALITY ASSURANCE

- A. Finish joints according to NOMMA Guideline 1.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept metal fabrications on-Site in labeled shipments. Inspect for damage.
- C. Protect metal fabrications from damage by exposure to weather or by ground contact.

1.7 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 DOOR FRAMES

- A. Description:
 - 1. Steel channel sections.
 - 2. Size: As indicated on Drawings.
 - 3. Jamb Anchors:
 - a. Suitable for building into masonry.
 - b. Anchor as indicated on Drawings.
 - 4. Finish: Galvanized.

2.2 BOLLARDS

- A. Description:
 - 1. Steel pipe, concrete filled.
 - 2. Crowned cap.

3. Size: 6-inch diameter, length as indicated on Drawings.
4. Finish: Prime paint and finish paint per Section 099000 - Painting and Coating, safety yellow.

B. Concrete Fill:

1. As specified in Section 033000 - Cast-in-Place Concrete.

C. Anchors: Concealed type as indicated on Drawings.

2.3 STRUCTURAL SUPPORTS

A. Other Structural Supports:

1. Description: Steel sections, shape and size as indicated on Drawings.
2. Finish: Prime paint and finish paint per Section 099000 - Painting and Coating.

2.4 ANCHORS

A. Description:

1. ASTM F1554; Grade 36.
2. Shape: Straight.
3. Furnish with nut and washer.
4. Finish: None.

B. Epoxy Adhesive Anchors:

1. Manufacturers:
 - a. Hilti.
 - b. Simpson Strong-Tie.
 - c. Sika.
 - d. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - e. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Grout: As specified in Section 036000 - Grouting.

2.5 MATERIALS

A. Steel:

1. Structural Shapes: ASTM A36.
2. Channels and Angles: ASTM A36.
3. Steel Plate: ASTM A36.
4. Hollow Structural Sections: ASTM A500, Grade B.
5. Steel Pipe: ASTM A53, Grade B, Schedule 40.

6. Sheet Steel: ASTM A653, Grade 33 Structural Quality.
7. Bolts: ASTM A307; Grade A or B; ASTM A325; Type 1.
8. Nuts: ASTM A563; heavy-hex type.
9. Washers: ASTM F436; Type 1.
10. Welding Materials: AWS D1.1; type required for materials being welded.

B. Stainless Steel:

1. Bars and Shapes: ASTM A276; Type 316.
2. Tubing: ASTM A269; Type 316.
3. Pipe: ASTM A312, seamless; Type 304.
4. Plate, Sheet, and Strip: ASTM A240; Type 304.
5. Bolts, Nuts, and Washers: ASTM A354.
6. Welding Materials: AWS D1.6; type required for materials being welded.

C. Aluminum:

1. Extruded Aluminum: ASTM B221 Alloy 6063, Temper T5.
2. Sheet Aluminum: ASTM B209 Alloy 6061, Temper T4.
3. Aluminum-Alloy-Drawn Seamless Tubes: ASTM B210 Alloy 6063, Temper T6.
4. Aluminum-Alloy Bars: ASTM B211 Alloy 6063, Temper T6.
5. Aluminum-Alloy Sand Castings: ASTM B26, Alloy as required to suit application.
6. Aluminum-Alloy Die Castings: ASTM B85, Alloy as required to suit application.
7. Bolts, Nuts, and Washers: Stainless steel.
8. Welding Materials: AWS D1.1; type required for materials being welded.

D. Bolts, Nuts, and Washers for Equipment and Piping:

1. Carbon Steel:
 - a. Structural Connections: ASTM A307, Grade A or B, hot-dip galvanized.
 - b. Anchor Bolts: ASTM A307, Grade A, hot-dip galvanized.
 - c. Pipe and Equipment Flange Bolts: ASTM A193, Grade B-7.
2. Stainless Steel: Type 316 stainless steel, Class 2; ASTM A193 for bolts; ASTM A194 for nuts.

2.6 FABRICATION

- A. Fit and shop-assemble items in largest practical sections for delivery to Site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small, uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- G. Fabrication Tolerances:
 - 1. Squareness: 1/8-inch maximum difference in diagonal measurements.
 - 2. Maximum Offset between Faces: 1/16 inch.
 - 3. Maximum Misalignment of Adjacent Members: 1/16 inch.
 - 4. Maximum Bow: 1/8 inch in 48 inches.
 - 5. Maximum Deviation from Plane: 1/16 inch in 48 inches.

2.7 FINISHES

A. Steel:

- 1. Prepare surfaces to be primed according to Section 099000 - Painting and Coating.
- 2. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- 3. Do not prime surfaces in direct contact with concrete or where field welding is required.
- 4. Prime-paint items according to Section 099000 - Painting and Coating, except where galvanizing is specified.
- 5. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.
- 6. Galvanizing for Fasteners, Connectors, and Anchors:
 - a. Hot-Dip Galvanizing: ASTM A153.
 - b. Mechanical Galvanizing: ASTM B695; Class 50 minimum.
- 7. Bolts: Hot-dip galvanized.
- 8. Nuts: Hot-dip galvanized.
- 9. Washers: Hot-dip galvanized.

B. Stainless Steel:

- 1. Satin-Polished Finish: Number 4, satin directional polish parallel with long dimension of finished face.
- 2. Mirror-Polished Finish: Number 8, mirror polish with preliminary directional polish lines removed.

C. Aluminum:

- 1. Aluminum Surfaces:
 - a. Conform to AAMA A41, anodized.
 - b. Prepared with chemical C pretreatment.
 - c. Anodized to clear color.
- 2. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Clean and strip primed steel items to bare metal and aluminum where Site welding is required.
- C. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, and free from distortion or defects.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Make provisions for erection stresses. Install temporary bracing to maintain alignment until permanent bracing and attachments are installed.
- D. Field-weld components indicated on Drawings.
- E. Perform field welding according to AWS D1.1.
- F. Obtain approval of Engineer prior to Site cutting or making adjustments not scheduled.

3.4 TOLERANCES

- A. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Maximum Variation from Plumb: 1/4 inch per story or for every 12 feet in height, whichever is greater, non-cumulative.
- C. Maximum Variation from Level: 1/16 inch in 3 feet and 1/4 inch in 10 feet.
- D. Maximum Offset from Alignment: 1/4 inch.
- E. Maximum Out-of-Position: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Welding: Inspect welds according to AWS D1.1.
- B. Replace damaged or improperly functioning hardware.
- C. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.
- D. Touch up factory-applied finishes according to manufacturer-recommended procedures.

3.6 ADJUSTING

- A. Adjust operating hardware and lubricate as necessary for smooth operation.

END OF SECTION 055000

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural floor, wall, and roof framing.
2. Built-up structural beams and columns.
3. Engineered wood products for the following:
 - a. Floor, wall, and roof framing.
4. Sheathing and underlayment locations for the following:
 - a. Floor, wall, and roof sheathing.
5. Factory wood treatment.
6. Accessories:
 - a. Fasteners and anchors.
 - b. Sill gaskets and flashings.
 - c. Preservative treatment of wood.
 - d. Fire-retardant treatment of wood.

B. Related Requirements:

1. Section 036000 - Grouting.
2. Section 042900 - Engineered Unit Masonry.
3. Section 074113 - Metal Roof Panels

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.
- B. American Wood Protection Association:
 1. AWPA M4 - Standard for the Care of Preservative-Treated Wood Products.
 2. AWPA U1 - Use Category System: User Specification for Treated Wood.

- C. APA - The Engineered Wood Association:
 - 1. APA - Plywood Design Specification, including supplements.
 - 2. APA AFG-01 - Adhesives for Field-Gluing Plywood to Wood Framing.
 - 3. APA PS 1 - Voluntary Product Standard - Structural Plywood.

- D. ASTM International:
 - 1. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
 - 3. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.
 - 4. ASTM C1396 - Standard Specification for Gypsum Board.
 - 5. ASTM D2559 - Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions.
 - 6. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems.
 - 7. ASTM D5456 - Standard Specification for Evaluation of Structural Composite Lumber Products.
 - 8. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 9. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 10. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

- E. Forest Stewardship Council:
 - 1. FSC Guidelines.

- F. Green Seal:
 - 1. GS-36 - Green Seal Standard for Adhesives for Commercial Use.

- G. Redwood Inspection Service:
 - 1. RIS - Standard Specifications for Grades of California Redwood Lumber.

- H. Southern Pine Inspection Bureau:
 - 1. SPIB - Standard Grading Rules for Southern Pine Lumber.

- I. U.S. Department of Commerce National Institute of Standards and Technology:
 - 1. DOC PS 1 - Structural Plywood.
 - 2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
 - 3. DOC PS 20 - American Softwood Lumber Standard.

- J. West Coast Lumber Inspection Bureau:
 - 1. WCLIB Standard 17 - Grading Rules for West Coast Lumber.

- K. Western Wood Products Association:
 - 1. WWPA - Western Lumber Grading Rules.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Product Data: Submit manufacturer information on insulated sheathing, wood preservative materials, and application instructions.

1.6 QUALITY ASSURANCE

- A. Perform Work according to:
 - 1. Lumber Grading Agency: Certified by DOC PS 20.
 - 2. Wood Structural Panel Grading Agency: Certified by APA - The Engineered Wood Association.
 - 3. Lumber: DOC PS 20.
 - 4. Wood Structural Panels: DOC PS 1 or PS 2.
- B. Surface-Burning Characteristics:
 - 1. Fire-Retardant-Treated Materials: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.
- C. Apply label from agency approved by authority having jurisdiction to identify each preservative-treated and fire retardant-treated material.
- D. Perform Work according to California Building Code standards.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect trusses from warping or other distortion by stacking in vertical position and bracing to resist movement.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 ENGINEERED WOOD PRODUCTS

- A. Manufacturers:
 - 1. Boise Cascade.
 - 2. Roseburg.
 - 3. Weyerhaeuser.
 - 4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Engineered Wood Products:
 - 1. Manufactured with an exterior-type adhesive according to ASTM D2559.
 - 2. Evaluated and monitored according to ASTM D5456.
- C. Types:
 - 1. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths.
 - 2. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths.

2.2 MATERIALS

- A. Lumber:
 - 1. Lumber Grading Rules: Comply with WCLIB or WWPA.
 - 2. Roof, Ceiling, and Miscellaneous Framing:
 - a. Species: Douglas Fir.
 - b. Grade: #1.
 - c. Maximum Moisture Content: 19 percent.
- B. Sheathing:
 - 1. Wood Structural Panel Roof Sheathing:
 - a. Description: APA-rated plywood; Structural I where noted on the Drawings.
 - b. Span Rating: See Drawings.

- c. Exposure Durability: Exterior or Exposure 1.
 - d. Facing: Sanded.
 - e. Grade: See Drawings.
2. Wood Structural Panel Wall Sheathing:
 - a. Description: APA-rated.

2.3 FACTORY WOOD TREATMENT

- A. Wood Preservative (Pressure Treatment): AWWPA U1, Commodity Specifications A-Sawn Products or F-Wood Composites, using waterborne ACQ preservative.
- B. Fire-Retardant Treatment:
 1. Chemically treated and pressure impregnated.
 2. Flame Spread: 25 or less when tested according to ASTM E84 and showing no evidence of significant progressive combustion when test is continued for an additional 20 minutes.
 3. Type: Interior.
- C. Moisture Content after Treatment: Re-dried.
 1. Lumber: Maximum 19 percent.
 2. Structural Panels: Maximum 15 percent.

2.4 ACCESSORIES

- A. Fasteners and Anchors:
 1. Fasteners:
 - a. High-Humidity and Treated Wood Locations: ASTM A153, hot-dip galvanized steel.
 - b. Elsewhere: Unfinished steel.
 2. Nails and Staples: Comply with ASTM F1667.
- B. Structural Framing Connectors:
 1. Material: Hot-dipped galvanized steel.
 2. Size: To suit framing conditions.
 3. Manufactured by Simpson Strong-tie.

PART 3 - EXECUTION

3.1 APPLICATION

A. Framing:

1. Select individual pieces such that knots and defects will not interfere with placement of bolts when nailing or making connections.
2. Discard defective pieces.
3. Set structural members level, plumb, and in correct position.
4. Fasten framing according to California Building Code.
5. Make provisions for erection loads and for sufficient temporary bracing to maintain that structure is safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
6. Place horizontal members crown side up.
7. Construct load-bearing framing and curb members full length without splices.
8. Openings:
 - a. Double members at openings over 48 inches wide.
 - b. Space short studs over and under opening to stud spacing.
9. Headers:
 - a. Construct double-joint headers at floor openings, ceiling openings, and under-wall stud partitions parallel to floor joists.
 - b. Frame rigidly into joists.
10. Joists with Span Greater than 8 Feet:
 - a. Bridge as detailed.
 - b. Fit solid blocking at ends of members.
11. Roof Curbs:
 - a. Curb roof openings except where prefabricated curbs are provided.
 - b. Form corners by alternating lapping side members.

B. Sheathing:

1. Secure roof sheathing with longer edge (strength axis) perpendicular to framing members, with ends staggered and sheet ends over bearing.
2. Install solid edge blocking between sheets where noted on the Drawings.
3. Place building paper horizontally over wall sheathing and weather-lap edges and ends.
4. Secure wall sheathing with long dimension parallel to wall studs, with ends over firm bearing.

C. Site-Applied Wood Treatment:

1. Brush-apply two coats of preservative treatment on wood in contact with cementitious materials.

2. Treat Site-sawn cuts by applying preservative according to AWPA M4.
3. Allow preservative to dry prior to erecting members.

3.2 TOLERANCES

- A. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Framing and Furring Members to Receive a Finished Wall or Ceiling: Align finish surface to vary not more than 1/8 inch from a theoretical plane or surface of the room or space.
- C. Other Framing Members: Maximum 1/4 inch from indicated position.
- D. Surface Flatness of Floor:
 1. Minimum: 1/4 inch in 10 feet.
 2. Maximum: 1/2 inch in 30 feet.

END OF SECTION 061000

SECTION 072116 - BLANKET INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Batt insulation and vapor retarder in exterior wall and ceiling and roof construction.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. ASTM International:

1. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
3. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
4. ASTM E970 - Standard Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: Submit manufacturer data on product characteristics, performance criteria, and limitations.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

1.6 QUALITY ASSURANCE

A. Surface Burning Characteristics of Insulation Installed in Concealed Locations:

1. Batt Insulation: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.

B. Surface Burning Characteristics of Insulation Installed in Exposed Locations:

1. Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.
2. Attic Floor Insulation: Minimum 0.038 Btu/sq. ft.-h critical radiant flux when tested according to ASTM E970.

1.7 QUALIFICATIONS

- ### A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- ### A. Refer to the Standard General Conditions and Supplementary Conditions.

- ### B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

- ### C. Store according to manufacturer instructions.

- ### D. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Remove insulation that becomes wet or damp.
3. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- #### A. Provide insulation in floor, roof, and wall framing as shown on the Drawings.

2.2 BATT INSULATION

- #### A. Manufacturers:

1. Johns Manville.
2. Knauf Insulation.
3. Owens Corning.

4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Vapor Retarder Permeance: Maximum 1 perm when tested according to ASTM E96.

2.3 MATERIALS

A. Batt Insulation:

1. Description: Preformed glass-fiber batt, with friction fit.
2. Comply with ASTM C665.
3. Thermal Resistance: R-value as shown on Drawings.
4. Size: To fit between framing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.

3.2 INSTALLATION

- A. Install in exterior wall, roof, and ceiling spaces without gaps or voids.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Do not compress insulation.
- D. Trim insulation neatly to fit spaces.
- E. Insulate miscellaneous gaps and voids.
- F. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

END OF SECTION 072116

SECTION 074113 - METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Architectural standing seam metal roofing.
2. Underlayment.
3. Eave protection.
4. Metal fasciae, flashings, and trim.

B. Related Requirements:

1. Section 061000 - Rough Carpentry: Plywood roof deck substrate.
2. Section 072116 - Blanket Insulation: Flexible insulation under sheet metal roofing system.
3. Section 099000 - Painting and Coating: Field painting.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Architectural Manufacturers Association:

1. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
2. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

C. American Iron and Steel Institute:

1. AISI NASPEC - North American Specification for the Design of Cold-Formed Steel Structural Members.

D. American Society of Civil Engineers:

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

E. ASTM International:

1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
3. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
4. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
5. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
6. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
7. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
8. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
9. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
10. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
11. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
12. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
13. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
14. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
15. ASTM E1918 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
16. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

F. Federal Specification Unit:

1. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

G. National Roofing Contractors Association:

1. NRCA - Roofing and Waterproofing Manual.

H. Sheet Metal and Air Conditioning Contractors' National Association:

1. SMACNA - Architectural Sheet Metal Manual.

I. UL:

1. UL 580 - Tests for Uplift Resistance of Roof Assemblies.

J. U.S. Environmental Protection Agency:

1. ENERGY STAR - ENERGY STAR Voluntary Labeling Program.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.6 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Product Data:
1. Submit fabricator information on metal types, finishes, and characteristics.
 2. Submit color charts for finish selection.
- D. Shop Drawings:
1. Indicate metal roofing panel profiles, jointing patterns, jointing details, fastening methods, flashings, terminations, and installation details.
- E. Fabricator's Certificate: Certify that products meet or exceed specified requirements.
- F. Fabricator Instructions: Submit detailed instructions on installation requirements, including special procedures for roofing penetrations, flashings, and perimeter conditions requiring special attention.
- G. Qualifications Statements:
1. Submit qualifications for fabricator and installer.

1.7 QUALITY ASSURANCE

- A. Perform Work according to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

1.8 QUALIFICATIONS

- A. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by fabricator.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on-site in manufacturer's original packaging and inspect for damage.
- C. Storage:
 - 1. Store materials according to fabricator instructions.
 - 2. Stack material to provide ventilation and to prevent twisting, bending, and abrasion.
 - 3. Slope metal sheets to ensure drainage.
- D. Protection:
 - 1. Prevent contact with materials causing discoloration or staining.
 - 2. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 3. Provide additional protection according to fabricator instructions.

1.10 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.11 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Furnish 20-year fabricator's warranty for sheet metal roofing against structural failure, corrosion, and water penetration.
- C. Furnish 20-year manufacturer's warranty for metal finish against fading, chipping, chalking, and blistering.

PART 2 - PRODUCTS

2.1 MANUFACTURED SHEET METAL ROOFING

- A. Manufacturers:
 - 1. MBCI.
 - 2. McElroy Metal.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Performance and Design Criteria:
 - 1. Wind Uplift Resistance: Comply with UL 580, Class 90.
- C. Accommodate following for exterior components without damage to system or components or causing deterioration of seals:
 - 1. Movement within system.
 - 2. Movement between system and perimeter framing components.
 - 3. Dynamic loading and release of loads.
 - 4. Deflection of structural support framing.
 - 5. Expansion and contraction over temperature range of 170 deg. F during 12-hour period.
- D. Architectural Standing Seam Metal Roofing:
 - 1. MBCI Superlok, or equal.
 - 2. Description: Factory-formed metal roofing panel system with concealed fasteners.
 - 3. Panels:
 - a. Steel Sheet:
 - 1) Material: Prefinished.
 - 2) Base Metal Thickness: 24 gauge.
 - b. Nominal Width: 16 inches.
 - c. Profile: Smooth striated.
 - d. Coating: Precoated signature 300, 70% fluoropolymer.
 - 4. Seams:
 - a. Type: Standing, mechanical field seamed.
 - b. Height: 2 inches.
 - 5. Color: To be selected during submittal phase.

2.2 MATERIALS

A. Sheet Metal:

1. Description: Prefinished galvanized steel, coil coated.
2. Comply with ASTM A755/A755M.
 - a. Base Metal:
 - 1) Comply with ASTM A653/A653M.
 - 2) Quality: Structural.
 - 3) Grade: $F_y=50$ ksi.
 - 4) Zinc Coating: Class G90.
 - b. Exposed Finish Coating: Minimum three coats fluoropolymer with minimum 70 percent polyvinylidene fluoride (PVDF) resin.

2.3 FABRICATION

- A. Form section shapes as indicated on Drawings, accurate in size, square, and free from distortion or defects.
- B. Fasciae, Trim, Flashings, and Other Metal Components:
 1. Same material as metal roof panels.
 2. Provide exposed metal surfaces with same finish as exposed face of metal roof panels.
- C. Cleats:
 1. Material: Same as sheet.
 2. Interlock with sheet.
- D. Starter Strips:
 1. Description: Continuous, to interlock with sheet.
 2. Material: Same as sheet.
- E. Form pieces in longest practical lengths; roof panels shall be single-length sheets.
- F. Hems and Seams:
 1. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
 2. Hem exposed edges on underside 1/2 inch.
 3. At moving joints, use sealed and lapped bayonet-type or interlocking hooked seams.
- G. Corners:
 1. One piece.
 2. Minimum Leg Length: 18 inches.
 3. Miter and seam corners and seal with sealant.

H. Flashings:

1. Allow toe to extend 2 inches over roofing.
2. Return and brake edges.

I. Profile and Size of Accessories:

1. Anchorage Devices: Comply with SMACNA, type as recommended by fabricator.

2.4 ACCESSORIES

A. Fasteners:

1. Material: Type as recommended by roofing fabricator.

B. Underlayment:

1. Description: Unperforated asphalt felt.
2. Type: II, No. 30.
3. Comply with ASTM D226/D226M.

C. Fire-Resistant Roof Deck Protection:

1. Fiberglass-reinforced underlayment, mechanically fastened for UL Class A rating.
2. Versa-Shield by GAF, or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Wood and Metal Deck Substrate:

1. Inspect roof deck to verify that deck is clean and smooth; free of depressions, waves, or projections; and properly sloped to eaves.
2. Verify that deck is dry and free of snow and ice.
3. Verify that substrate joints are solidly supported and fastened.
4. Verify that wood nailers are installed and correctly located.

B. Structural Framing Substrate:

1. Verify that primary and secondary framing members are installed and fastened, properly aligned, and sloped to eaves.
2. Verify that damaged shop coatings are repaired with touchup paint.

C. Verify that roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets are in place, and nailing strips are located properly.

- D. Verify that roofing termination and base flashings are in place, sealed, and secure.
- E. Verify that insulation is installed and ready for roof application.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Wood and Metal Deck Substrate:
 - 1. Fill knot holes and surface cracks with latex filler at areas of bonded eave protection.
 - 2. Broom clean deck surfaces under eave protection and underlayment.
- C. Back paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to minimum dry film thickness of 15 mils.

3.3 INSTALLATION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. Ice Dam Membrane:
 - 1. Place edge of eaves and gable edge metal flashings tight with fascia boards.
 - 2. Weather-lap joints minimum 2 inches and seal with plastic cement.
 - 3. Secure flange with nails at maximum 12 inches o.c.
 - 4. Extend ice dam membrane a minimum of 2 feet upslope, beyond interior face of exterior wall.
- C. Underlayment:
 - 1. Apply underlayment over entire roof area in single layer fastened to substrate.
 - 2. Lay perpendicular to slope.
 - 3. Weather-lap edges 2 inches and nail in place.
 - 4. Stagger end joints minimum 24 inches.
 - 5. Apply slip sheet in one layer, laid loose.
- D. Standing Seam Metal Roofing:
 - 1. Comply with SMACNA details.
 - 2. Install blocking under roof sheathing at exposed areas.
 - 3. Panels:
 - a. Begin installation at eaves.
 - b. Long dimension perpendicular to eaves.
 - c. Lap ends minimum 6 inches.
 - d. Install clips to secure roof panels without deforming roof panels.

4. End Caps:
 - a. Snap standing seam cap in place over roofing panel vertical legs.
 - b. Miter seam cap at changes in direction.
 - c. Cut and trim end cap to conceal batten space at roofing panel terminations.
5. Termination:
 - a. Terminate roofing panels with sheet metal trim and flashing for watertight installation.
 - b. Close and conceal openings between roofing panels, panel seams, and roof substrate.
6. Seal metal joints watertight.

E. Flashing:

1. Reglets: Comply with SMACNA details.
2. Fascia:
 - a. Place eave edge and gable edge metal flashings tight to fascia.
 - b. Weather-lap joints 2 inches and seal with plastic cement.
 - c. Secure flange to substrate.
3. Valleys:
 - a. Form valleys with sheet metal not exceeding 10 feet in length.
 - b. Lap joints 6 inches in direction of drainage.
 - c. Extend valley sheet minimum 6 inches under roofing sheets.
4. Fasteners:
 - a. Secure flashings in place using concealed fasteners.
5. Secure flashing exposed edges with continuous maximum 24 inches o.c.
6. Apply plastic cement compound between metal flashings and felt flashings.
7. Fit flashings tight in place, making corners square, surfaces true and straight in planes, and lines accurate to profiles.
8. Seal metal joints watertight.

3.4 PROTECTION

- A. Do not permit traffic over unprotected roof surface.

END OF SECTION 074113

SECTION 081213.13 - STANDARD HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Fire rated steel and FRP frames.

B. Related Sections:

1. Section 042000 - Unit Masonry: Masonry grout fill of metal frames and placement of anchors into masonry wall construction.
2. Section 081313.13 - Standard Hollow Metal and FRP Doors.
3. Section 087100 - Door Hardware: Hardware.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCES

A. American National Standards Institute:

1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. ASTM International:

1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. National Fire Protection Association:

1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives.
3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

D. Underwriters Laboratories Inc.:

1. UL 10B - Fire Tests of Door Assemblies.
2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
3. UL 1784 - Air Leakage Tests of Door Assemblies.

1.4 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.
- D. Product Data: Submit frame configuration and finishes.
- E. Manufacturer's Installation Instructions: Submit special installation instructions.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Conform to requirements of ANSI A250.8.
- B. Fire Rated Frame Construction: Conform to NFPA 252.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Accept frames on site in manufacturer's packaging. Inspect for damage.
- C. Break seal on-site to permit ventilation.

1.8 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work with frame opening construction, door, and hardware installation.

PART 2 - PRODUCTS

2.1 STANDARD STEEL FRAMES

- A. Manufacturers:
 - 1. Ceco.
 - 2. Chem-Pruf.
 - 3. Curries.
 - 4. Steelcraft.
 - 5. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 6. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Description: Standard shop fabricated steel frames, fire rated and non-rated types.
 - 1. Exterior Frames (Metal):
 - a. Level 2 for Door Models 1, nominal 16 gage/0.053-inch-thick material, base metal thickness.
 - 2. Exterior Frames (FRP Corrosion Resistant):
 - a. Style 4 standard door frame.

2.2 ACCESSORIES

- A. Primer: ANSI A250.10 rust inhibitive type.
- B. Silencers: Specified in Section 087100 - Door Hardware.
- C. Weatherstripping: Specified in Section 087100 - Door Hardware.

2.3 FABRICATION

- A. Fabricate frames as welded unit.
- B. Mullions for Double Doors: Removable type, of same profiles as jambs.
- C. Fabricate frames with hardware reinforcement plates welded in place. Provide mortar guard boxes.
- D. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
- E. Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.
- F. Attach fire rated label to each fire rated frame.

- G. Fabricate frames to suit masonry wall coursing with 2-inch head member.

2.4 SHOP FINISHING

- A. Steel Sheet: Galvanized to ASTM A653 G60.
- B. Primer: Baked.
- C. Coat inside of frame profile with bituminous coating to minimum thickness of 1/16 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

- A. Install frames in accordance with ANSI A250.8.
- B. Coordinate with masonry wall construction for anchor placement.
- C. Coordinate installation of frames with installation of hardware specified in Section 087100 - Door Hardware, and doors in Section 081313.13 - Standard Hollow Metal and FRP Doors.
- D. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
- E. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- F. Field paint after installation per Section 099000 - Painting and Coating. Color to be selected by Owner.

3.3 ERECTION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

END OF SECTION 081213.13

SECTION 081313.13 - STANDARD HOLLOW METAL AND FRP DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-rated doors.

B. Related Sections:

1. Section 081213.13 - Standard Hollow Metal and FRP Frames.
2. Section 087100 - Door Hardware.
3. Section 099000 - Painting and Coating: Field painting of doors.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCES

A. American National Standards Institute:

1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. ASTM International:

1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM C1363 - Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM E413 - Classification for Rating Sound Insulation.

C. Hollow Metal Manufacturers Association:

1. HMMA 810 - Hollow Metal Doors.

D. National Fire Protection Association:

1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives.
3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

- E. Steel Door Institute:
 - 1. SDI 108 - Recommended Selection and Usage Guide for Standard Steel Doors.
- F. Underwriters Laboratories Inc.:
 - 1. UL 10B - Fire Tests of Door Assemblies.
 - 2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
 - 3. UL 1784 - Air Leakage Tests of Door Assemblies.

1.4 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, louvers, and finishes.
- D. Product Data: Submit door configurations, location of cut-outs for hardware reinforcement.
- E. Manufacturer's Installation Instructions: Submit special installation instructions.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSI A250.8.
- B. Fire-Rated Door and Panel Construction: Conform to NFPA 252, 20-minute fire rating.
- C. Attach label from agency approved by authority having jurisdiction to identify each fire-rated door.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years' documented experience.
- B. Installer: Company specializing in performing work of this section with minimum three years' documented experience approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Protect doors with resilient packaging.

- C. Accept doors on site in manufacturer's packaging. Inspect for damage.
- D. Break seal on site to permit ventilation.

1.8 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work with door opening construction, door frame, and door hardware installation.
- C. Coordinate installation to accommodate door hardware electric wire connections.

PART 2 - PRODUCTS

2.1 STANDARD STEEL DOORS

- A. Manufacturers:
 - 1. Ceco.
 - 2. Chem-Pruf Door Company.
 - 3. Curries.
 - 4. Steelcraft.
 - 5. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 6. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Description:
 - 1. Exterior Doors (Insulated): ANSI A250.8, 1³/₄-inch thick.
 - a. Level 2 - Heavy Duty, Model 1, full flush design.
 - 2. Exterior FRP Doors (Fire-Rated) (Corrosion Resistant): 1³/₄-inch thick.

2.2 COMPONENTS

- A. Face: Steel sheet or fiberglass reinforced plastic (FRP) in accordance with ANSI A250 and SDI 108.
- B. End Closure: Channel, 0.04 inches thick, flush.
- C. Core: Polypropylene honeycomb, polyurethane, and polystyrene foam.
- D. Thermal Insulated Door: Total insulation R-Value of 2.4, measured in accordance with ASTM C1363.

2.3 ACCESSORIES

- A. Louvers: Size as indicated on Drawings, supplied by door manufacturer.
- B. Primer: ANSI A250.10 rust inhibitive type.

2.4 FABRICATION

- A. Fabricate doors with hardware reinforcement welded in place.
- B. Attach astragal to one inactive leaf of pairs of doors.

2.5 SHOP FINISHING

- A. Steel Sheet: Galvanized to ASTM A653/A653M G60.
- B. Primer: Baked.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

- A. Install doors in accordance with ANSI A250.8.
- B. Install door louvers, plumb and level.
- C. Coordinate installation of glass and glazing specified in Section 088000.
- D. Coordinate installation of doors with installation of frames specified in Section 081213.13 and hardware specified in Section 087100.
- E. Touch-up damaged shop finishes.
- F. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.3 ERECTION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16-inch measured with straight edge, corner to corner.

- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

3.4 ADJUSTING

- A. Adjust door for smooth and balanced door movement.

3.5 SCHEDULE

- A. Refer to Door and Frame Schedule appended to this section.

END OF SECTION 081313.13

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hardware for steel and FRP doors.

B. Related Requirements:

1. Section 081213.13 - Standard Hollow Metal Frames: Silencers integral with steel frames.
2. Section 081313.13 - Standard Hollow Metal Doors: Shop-fabricated steel doors and door panels.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. Builders Hardware Manufacturers Association:

1. ANSI/BHMA Certified Products Directory.
2. ANSI/BHMA A156.1 - Butts and Hinges.
3. ANSI/BHMA A156.2 - Bored & Preassembled Locks and Latches.
4. ANSI/BHMA A156.3 - Exit Devices.
5. ANSI/BHMA A156.4 - Door Controls - Closers.
6. ANSI/BHMA A156.5 - Cylinders and Input Devices for Locks.
7. ANSI/BHMA A156.6 - Architectural Door Trim.
8. ANSI/BHMA A156.7 - Template Hinge Dimensions.
9. ANSI/BHMA A156.8 - Door Controls - Overhead Stops and Holders.
10. ANSI/BHMA A156.12 - Interconnected Locks & Latches.
11. ANSI/BHMA A156.13 - Mortise Locks.
12. ANSI/BHMA A156.14 - Sliding and Folding Door Hardware.
13. ANSI/BHMA A156.15 - Release Devices.
14. ANSI/BHMA A156.16 - Auxiliary Hardware.
15. ANSI/BHMA A156.17 - Self Closing Hinges.
16. ANSI/BHMA A156.18 - Materials and Finishes.
17. ANSI/BHMA A156.19 - Power Assist & Low Energy Power Operated Doors.
18. ANSI/BHMA A156.21 - Thresholds.
19. ANSI/BHMA A156.22 - Door Gasketing and Edge Seal Systems.
20. ANSI/BHMA A156.23 - Electromagnetic Locks.

21. ANSI/BHMA A156.24 - Delayed Egress Locks.
22. ANSI/BHMA A156.25 - Electrified Locking Devices.

C. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Listed Product and Code Compliance Directory.

D. NFPA:

1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

E. UL:

1. UL - Building Materials Directory.
2. UL 10B - Standard for Fire Tests of Door Assemblies.
3. UL 305 - Standard for Panic Hardware.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work of this Section with other directly affected Sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
- C. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.
- D. Coordinate mounting heights with door and frame manufacturers.
- E. Sequence installation to accommodate required utility connections.
- F. Coordinate Owner's keying requirements during course of Work.
- G. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.

1.5 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Product Data: Submit manufacturer information.
- D. Shop Drawings:
 1. Indicate locations and mounting heights of each type of hardware.
 2. Submit schedules, templates, and manufacturer's parts lists.

3. Submit wiring diagrams including system descriptions for electrical hardware, point-to-point and riser diagrams, and function statements.

E. Finish Hardware List:

1. Designate items of hardware furnished for each opening or place of installation, identified by floor name or number and door number as used in door schedule on Drawings.
2. Show door number and location, handing, door and frame material, manufacturer and catalog numbers, finishes, and keying information.
3. Explain abbreviations.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Manufacturer Instructions: Submit special procedures and perimeter conditions requiring special attention.

H. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

I. Qualifications Statements:

1. Submit qualifications for manufacturer and supplier.

1.6 CLOSEOUT SUBMITTALS

A. Refer to Standard General Conditions – Record Documents.

B. Project Record Documents: Record actual locations of installed cylinders and their master key code.

C. Operation and Maintenance Data: Submit manufacturer information regarding operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

D. Keys: Deliver with identifying tags to Owner by secure shipment direct from supplier.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Materials:

1. Furnish two extra key lock cylinders for each master keyed group.

B. Tools: Furnish special wrenches and tools applicable for each different and special hardware component.

1.8 QUALITY ASSURANCE

A. Perform Work according to:

1. ANSI/BHMA A156 series.

2. NFPA 80.
3. UL 305.

B. Furnish hardware marked and listed in BHMA Certified Products Directory.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

B. Supplier:

1. Company specializing in supplying commercial door hardware as specified in this Section, with minimum three years' documented experience.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Handling:

1. Package hardware items individually with necessary fasteners, instructions, and installation templates.
2. Label and identify each package with door opening code to match hardware schedule.

D. Store materials according to manufacturer instructions.

E. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.11 WARRANTY

A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Furnish five-year manufacturer's warranty for locksets and door closers.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

A. Fire-Rated Openings:

1. Provide door hardware UL listed, WH listed, or listed by other testing laboratory approved by applicable authorities.
2. Hardware Testing: Comply with NFPA 252.

2.2 DOOR HARDWARE

A. Hinges:

1. Manufacturers:

- a. McKinney.
- b. Stanley.
- c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
- d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2. Description:

- a. Type: Full mortise.
- b. Comply with ANSI/BHMA A156.1, A156.7, and A156.17.
- c. Widths: Sufficient to clear trim projection when door swings 180 degrees.
- d. Minimum Quantity per Door Leaf:

- 1) Doors 90 Inches High: Three hinges.
- 2) Doors 120 Inches High: Four hinges.
- 3) Fire-Rated Doors 86 Inches High: Three hinges.

3. Size and Weight:

- a. 1-3/4-Inch Doors: 4-1/2 inches, heavyweight.
- b. Doors Greater Than 40 Inches Wide: Extra heavyweight ball or oilite bearing type.
- c. Doors Greater Than 48 Inches Wide: 5 inches, extra heavyweight ball or oilite bearing type.

4. Pins:

- a. Type: Nonferrous and nonremovable.
- b. Location: Exterior and locked out-swinging doors.
- c. Furnish nonrising pins for interior doors.

B. Locksets:

1. Manufacturers:
 - a. Sargent.
 - b. Schlage.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Description:
 - a. Compatible with specified cylinders.
 - b. Typical Backset: 2-3/4 inches.
 - c. Strikes:
 - 1) Standard, with extended lips to protect trim from being marred by latchbolt.
 - 2) Verify type of cutouts provided in metal frames.
3. Mortise Locksets: Comply with ANSI/BHMA A156.13, Series 1000, Grade 1.
4. Bored (Cylindrical) Locksets: Comply with ANSI/BHMA A156.2, Series 4000, Grade 1.
5. Preassembled (Unit) Locksets: Comply with ANSI/BHMA A156.12, Series 2000, Grade 1.
6. Interconnected Locksets: Comply with ANSI/BHMA A156.12, Series 5000, Grade 1.

C. Latchsets:

1. Manufacturers:
 - a. McKinney.
 - b. Schlage.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Description:
 - a. Match locksets.
 - b. Typical Backset: 2-3/4 inches.
 - c. Strikes:
 - 1) Standard, with extended lips to protect trim from being marred by latchbolt.
 - 2) Verify type of cutouts provided in metal frames.
3. Mortise Latchsets: Comply with ANSI/BHMA A156.13, Series 1000, Grade 1.
4. Bored (Cylindrical) Latchsets: Comply with ANSI/BHMA A156.2, Series 4000, Grade 1.

D. Exit Devices:

1. Manufacturers:
 - a. Allegion.
 - b. Sargent Manufacturing.

- c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Description:
- a. Suitable for doors requiring exit devices.
 - b. Type: Concealed vertical rod, with crossbar.
 - c. Comply with ANSI/BHMA A156.3, Grade 1.
 - d. Strikes:
 - 1) Standard, with extended lips to protect trim from being marred by latchbolt.
 - 2) Verify type of cutouts provided in metal frames.
 - 3) Furnish dustproof floor strikes.
3. Coordinators: Overhead type at pairs of doors.
- E. Cylinders:
1. Manufacturers:
- a. McKinney.
 - b. Schlage.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Keying:
- a. As directed by Owner.
 - b. Furnish construction keying.
3. Keys:
- a. Material: Nickel-silver.
 - b. Stamp keys with "DO NOT DUPLICATE."
 - c. Minimum Quantities:
 - 1) Master Keys: Five.
- F. Closers:
1. Manufacturers:
- a. LCN.
 - b. Sargent.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2. Description:
 - a. Type: Modern, with cover.
 - b. Comply with ANSI/BHMA A156.4.
 - c. Mounting: Surface.
 - d. Operation: Full rack and pinion, with steel spring and nonfreezing hydraulic fluid.
 - e. Required for fire-rated doors.
 3. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
 4. Arms:
 - a. Type: To suit individual condition.
 - b. Furnish parallel-arm closers at reverse-bevel doors and where doors swing full 180 degrees.
 5. Location:
 - a. Exterior Doors: Inside of door.
 - b. Interior Doors: Room side of door.
 - c. Other Doors: Pull side of door.
 6. Maximum Operating Pressure:
 - a. Interior Doors: 5 lbf.
 - b. Exterior Doors: 8.5 lbf.
 - c. Fire-Rated Doors: 15 lbf.
- G. Protection Plates, Gaskets, Thresholds, and Trim:
1. Manufacturers:
 - a. Pemko.
 - b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
 2. Description: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
 3. Kickplates:
 - a. Comply with ANSI/BHMA A156.6.
 - b. Height: As indicated on hardware schedule.
 - c. Width: 1 inch less than door width.
 - d. Material:
 - 1) Stainless steel.
 - 2) Thickness: Minimum 0.050 inch.
 4. Weatherstripping: Continuous at top and sides of exterior doors.
 - a. Comply with ANSI/BHMA A156.21.

5. Fire-Rated Gaskets: Continuous at top and sides of fire-rated doors.
 - a. Comply with ANSI/BHMA A156.21 and A156.22.
6. Thresholds: Maximum height of 1/2 inch.
 - a. Comply with ANSI/BHMA A156.21.
7. Wall Stops:
 - a. Size: 3 inches.
 - b. Description: Convex or concave pad with no visible screws.
 - c. Comply with ANSI/BHMA A156.1, Grade 1.
8. Floor Stops:
 - a. Description: Standard floor type, with no visible screws.
 - b. Comply with ANSI/BHMA A156.1, Grade 1.

2.3 FINISHES

A. Finishes:

1. Comply with ANSI/BHMA A156.18.
2. Hinges:
 - a. Satin Finish: Comply with BHMA 630 and 626.
3. Typical Exterior Exposed and High Use Interior Door Hardware:
 - a. Satin-Finished Stainless Steel: Comply with BHMA 630.
4. Typical Interior Door Hardware:
 - a. Satin-Finished Stainless Steel: Comply with BHMA 630.
5. Closers:
 - a. Clear Anodized Satin Aluminum: Comply with BHMA 628.
6. Thresholds:
 - a. Clear Anodized Satin Aluminum: Comply with BHMA 628.
7. Other Items: Furnish manufacturer's standard finishes to match similar hardware types on same door, and maintain acceptable finish considering anticipated use and BHMA category of finish.

2.4 ACCESSORIES

- A. Lock Trim: Furnish levers with escutcheon plate as indicated in schedule following END OF SECTION.
- B. Through Bolts:
 - 1. Do not permit through bolts and grommet-nuts on door faces in occupied areas unless no alternative is possible.
 - 2. Do not use through bolts on solid-wood core doors.
- C. Fasteners:
 - 1. As recommended by hardware manufacturer and as required to secure hardware.
 - 2. Finish: Match hardware item being fastened.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that doors and frames are ready to receive door hardware.
- B. Verify that dimensions are as indicated on Shop Drawings by manufacturer.

3.2 INSTALLATION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. Mounting Heights from Finished Floor to Center Line of Hardware Item:
 - 1. Comply with manufacturer recommendations and applicable codes, if not otherwise indicated.
 - 2. Locksets: 38 inches.
 - 3. Push/Pulls: 42 inches.
 - 4. Deadlocks: 48 inches.
 - 5. Push Pad-Type Exit Devices: 42 inches.
 - 6. Crossbar-Type Exit Devices: 38 inches.
 - 7. Top Hinge: Jamb manufacturer's standard, but not greater than 10 inches from head of frame to centerline of hinge.
 - 8. Bottom Hinge: Jamb manufacturer's standard, but not greater than 12-1/2 inches from floor to centerline of hinge.
 - 9. Intermediate Hinges: Equally spaced between top and bottom hinges and from each other.
 - 10. Hinge Mortise on Door Leaf: 1/4 inch to 5/16 inch from stop side of door.

3.3 ADJUSTING

- A. Adjust hardware for smooth operation.

3.4 PROTECTION

- A. Do not permit adjacent Work to damage hardware or hardware finish.

3.5 ATTACHMENTS

- A. Hardware Schedule:

1. Hardware Group A – Exterior Single Doors:

- a. Hinges: Full mortise, Stanley FBB, or McKinney equal.
- b. Lockset:
 - 1) Type: Mortise.
 - 2) Schlage L9453 P-06, Sargent Series 8200, or equal.
- c. Closer: Surface mounted.
 - 1) Sargent 1430 PSH, LCN 1460 H Cush, or equal.
- d. Latch Guard: Glynn-Johnson LP Series; or equal; stainless steel satin finish.
- e. Weatherstrip: Pemko S44; Reese 796B; or equal. Install after door and frame are finish painted.
- f. Threshold: Pemko 270A; Reese S404A; or equal. Set threshold on continuous bead of polyurethane joint sealant at all bearing points. Caulk the jambs after painting.
- g. Door Shoe: Pemko 216AV; Reese DB595AF; or equal.
- h. Head Drip: Pemko 346C; Reese 201A; or equal. Extend 2 inches beyond each side of door opening. Attach to frame with galvanized steel sheet metal screws.
- i. Kickplate: Ives 8400, or equal; 12 inches tall, 2 inches less than door width, stainless steel.

2. Hardware Group B – Exterior Double Doors:

- a. Hinges: Stanley FBB 191 or McKinney equal; stainless steel satin finish; 1½ pair 4½ x 4½, NRP.
- b. Lockset: Provide active leaf with Schlage L9453P-06, Sargent Series 8100, or equal; level handle; dull chrome finish; keyed to the Owner's master.
- c. Door Closer: On active leaf provide Sargent 1430 PSH, LCN 1460 H Cush, or equal.
- d. Weatherstrip: Pemko PF114PS, Reese 796B, or equal. Install after door and frame are finish painted.
- e. Threshold: Pemko 270A, Reese S404A, or equal. Set threshold on continuous bead of polyurethane joint sealant at all bearing points. Caulk the jambs after painting.
- f. Door Shoe: Pemko 216AV, Reese DB595AF, or equal.
- g. Head Drip: Pemko 346C, Reese 201A, or equal. Extend 2 inches beyond each side of door opening. Attach to frame with galvanized steel sheet metal screws.

- h. Panic: Sargent 8813 ETL, Von Duprin 99L, or equal at Ponderosa Way Pump Station chemical room door only.
- i. Kickplate: Ives 8400 or equal; 12 inches tall, 2 inches less than door width, stainless steel.

END OF SECTION 087100

SECTION 099000 - PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Surface preparation and field application of paints and other coatings.
2. Painting and finishing of interior and exterior surfaces:
 - a. Structural steel.
 - b. Miscellaneous metals.
 - c. Ceilings.
 - d. Walls.
 - e. Floors.
 - f. Doors.
 - g. Frames.
 - h. Roof fans.
 - i. Construction signs.
 - j. Guardrails.
 - k. Posts.
 - l. Fittings.
 - m. Valves.
 - n. Equipment.
 - o. Pumps.
 - p. Piping.
 - q. Metal pipe lining and coating systems.
 - r. All other work obviously required to be painted unless otherwise specified herein or on the Drawings.
3. Omission of minor items in the schedule of work shall not relieve the Contractor of his obligation to include such items where they come within the general intent of the specification as stated herein.
4. The Contractor shall furnish all materials, labor, equipment, and incidentals required to provide a protective coating system for the surfaces listed herein and not otherwise excluded.
5. The following items will not be painted:
 - a. Code-requiring labels, such as:
 - 1) Underwriters' Laboratories and Factor Mutual.
 - 2) Equipment identification.
 - 3) Performance rating.
 - 4) Name or nomenclature plates.

- b. Unless otherwise indicated, moving parts of operating units, mechanical, and electrical parts such as:
 - 1) Valve and damper operators.
 - 2) Linkages.
 - 3) Sinkages.
 - 4) Sensing devices.
 - 5) Motor and fan shafts.
- c. Concrete surfaces, except as noted herein.
- d. Aluminum handrails (except where aluminum is in contact with damp concrete).
- e. Walkways.
- f. Windows.
- g. Louvers.
- h. Grating.
- i. Nonferrous and corrosion-resistant ferrous alloys such as:
 - 1) Copper.
 - 2) Bronze.
 - 3) Monel.
 - 4) Aluminum.
 - 5) Chromium plate.
 - 6) Stainless steel.
 - 7) Except where:
 - a) Required for electrical insulation between dissimilar metals.
 - b) Aluminum is in contact with damp concrete or masonry.
 - c) Color coding of equipment and piping is required.
 - d) Protection of metals is required in wet, humid, or chlorine environments.
- j. Signs and nameplates.
- k. Finish hardware.
- l. Non metallics materials such as:
 - 1) Glass.
 - 2) Polyvinyl Chloride (PVC).
 - 3) Concealed wood.
 - 4) Porcelain.
 - 5) Plastics.
 - 6) Except as required for architectural painting or color coding.
- m. Small piping including:
 - 1) Exposed electrical conduits.
 - 2) Plumbing.
- n. Electrical panels and equipment with finished enamel coatings applied by the manufacturer.
- o. Roof gutters and downspouts with anodized or baked-on enamel finish.

- p. Piping and conduit in wet well and backwash basin, except as specifically noted herein. Touch-up is required on fusion bonded epoxy coated steel pipe.
- q. Package treatment units C except as required for touch-up.
- r. Sludge pump.
- s. Air compressor.
- t. Products with polished chrome, aluminum, nickel, or stainless steel finish.
- u. Plastic switch plates and receptacle plates.
- v. Lubricated bearing surfaces.
- w. Insulation.
- x. Metal and plastic pipe interior unless otherwise indicated.
- y. Sprinkler heads.

B. Related Requirements:

- 1. Section 055000 - Metal Fabrications: Shop-primed items.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 DEFINITIONS

- A. Refer to ASTM D16 for definitions of terms used in this Section.

1.4 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. ASTM International:

- 1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
- 2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
- 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. California Department of Public Health:

- 1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

D. Green Seal:

- 1. GS-03 - Anti-Corrosive Paints.
- 2. GS-11 - Paints and Coatings.

- E. Master Painters Institute:
 - 1. MPI - Approved Products List.
 - 2. MPI - Architectural Painting Manual.
- F. SSPC – Steel Structures Painting Council.
- G. Metal Ladder Manufacturer’s Association – Specification for Ladders and Scaffolds.
- H. UL and Cal OSHA requirements for Ladders and Scaffolds.

1.5 SEQUENCING

- A. Refer to Engineer’s Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES.
- B. Do not apply finish coats until paintable sealant is applied.
- C. Back prime wood trim before installation of trim.

1.6 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data:
 - 1. Manufacturer’s Product Data Sheet (PDS) for all products of each paint system.
 - 2. Include MPI - Approved Products Lists with proposed products highlighted.
 - 3. Colors not specified shall be selected by the Engineer during the Shop Drawing submittal phase of the project.
- C. Manufacturer’s Safety Data Sheet for all products of each paint system.
- D. Manufacturer’s Coating Preparation and Application Sheet (CPAS) for all products of each paint system.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements and comply with Federal, State, and Local, whichever is more stringent, requirement for Volatile Organic Compound (VOC).
- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- G. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and applicator.
 - 2. Submit manufacturer's approval of applicator.

1.7 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Operation and Maintenance Data: Submit information on cleaning, touchup, and repair of painted and coated surfaces.

1.8 QUALITY ASSURANCE

- A. Workmanship shall be performed by skilled workmen thoroughly trained in necessary crafts and completely familiar with specific requirements and methods specified herein.
- B. All materials of a given paint system shall be produced by a single manufacturer. However different paint systems may be produced by different paint manufacturers.
- C. MPI Standards:
 - 1. Comply with indicated MPI standards.
 - 2. Products: Listed in MPI - Approved Products List.
- D. Surface Burning Characteristics:
 - 1. Fire-Retardant Finishes: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.
- B. Applicator: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Container Labeling: Include manufacturer's name, type of paint, brand name, batch number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, instructions for mixing and reducing, application instruction and contents by volume for major constituents.
- C. Inspection:
 - 1. Accept materials on Site in manufacturer's sealed and labeled containers.
 - 2. Inspect for damage and to verify acceptability.
- D. Store materials in ventilated area and otherwise according to manufacturer instructions.

- E. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.
- F. Paint, coatings, reducing agents, and other solvents must be stored in original containers until opened; if not resealable, then must be transferred to UL approved safety containers. Provide proper ventilation, personal protection, and fire protection for storage and use of same.
- G. Comply with requirements set forth by Occupational Safety and Health Act (OSHA) for storage and use of painting materials and equipment.

1.11 AMBIENT CONDITIONS

- A. Storage Conditions per the CPAS.
- B. Application Conditions per the CPAS.

1.12 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Furnish five-year manufacturer's warranty for paint and coatings.

PART 2 - PRODUCTS

2.1 PAINTS AND COATINGS

- A. Manufacturers:
 - 1. Paint products/systems specified are not intended to limit competition, but to establish a desired standard of quality and type of generic coating.
 - 2. BASF-Master Builders, Shakopee, MN (Master Builders).
 - 3. Carboline Company, St. Louis, MO (Carboline).
 - 4. Kelly-Moore Paint Co., Redding, CA (Kelly-Moore).
 - 5. Pittsburgh Paint, Pittsburgh, PA; Cascade Paint, Redding, CA (Pittsburgh).
 - 6. Sherwin-Williams Co., Cleveland, OH; Redding, CA (Sherwin Williams).
 - 7. Sunshine Supply Co., San Diego, CA (Sunshine).
 - 8. Tnemec Inc., Kansas City, MO (Tnemec).
 - 9. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 10. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

11. Equivalent materials of other manufacturers may be substituted on approval of the Owner's Representative. Request substitution shall include manufacturer's literature for each product giving name, generic type, descriptive information, performance and test data, and evidence of satisfactory past performance. No request for substitution shall be considered that would decrease film thickness and/or number of coats or offer a change in the generic type of coating specified.
 - a. No request will be considered unless request for approval has been submitted by the Contractor during the Shop Drawing Submittal phase of the project.
 - b. The Owner's Representative's decision of approval or disapproval of the proposed substitution shall be final.
12. Furnish materials according to manufacturer's standards.

B. Paint Products:

1. Deviations from the specified paint systems or products may be approved subject to the approval of the paint manufacturer and the Engineer.
2. Any chemical, including protective materials such as coatings, linings, and liners, that will result in contact with drinking water must be certified as meeting the specifications of NSF 61 and Addendum 1.0.
 - a. Acrylic Epoxy:
 - 1) Aquapon WB 98-Line, Semi-Gloss (Pittsburgh).
 - 2) Pro Industrial Pre-Catalized WB Epoxy (Sherwin Williams).
 - 3) Series 113 HB Tneme-Tufcoat (Tnemec).
 - b. Acrylic Satin:
 - 1) Pitt Tech 90 Series Acrylic Enamel, Satin Finish (Pittsburgh).
 - 2) A-100 Exterior Latex, Satin Finish (Sherwin Williams).
 - 3) Series 1029 Enduratone (Tnemec).
 - c. Clear Sealer:
 - 1) Protectosil Aqua-trete (Degussa).
 - 2) Conflex 7% Siloxane Water Repellant (Sherwin Williams).
 - 3) Prime-A-Pell Plus Series 662 (Tnemec).
 - d. Clear Sealer (Masonry/Concrete Block):
 - 1) MasterProtect H185 (Master Builders).
 - 2) Chemstop Heavy Duty (Tamms).
 - e. Elastomeric Primer:
 - 1) No. 250 Primer (Kelly-Moore).
 - 2) Loxon Masonry & Concrete Primer (Sherwin Williams).
 - 3) Elasto-Grip Series 156 (Tnemec).

- f. Epoxy DTR:
 - 1) Pitt-Guard 97-145 Series DTR (Pittsburgh).
 - 2) Macropoxy 646 (Sherwin Williams).
 - 3) Chembuild Series 135 (Tnemec).

- g. Epoxy Intermediate:
 - 1) Carboguard 691 (Carboline).
 - 2) Carboguard 891 (Carboline).
 - 3) Macropoxy 646PW (Sherwin Williams).
 - 4) Series V140F Pota-Pox Plus (Tnemec).
 - 5) Series L69 Hi-Build Epoxoline II (Tnemec).

- h. Epoxy Primer/Epoxy Finish:
 - 1) Plasite 9060 (Carboline).
 - 2) Macropoxy 646PW (Sherwin Williams).
 - 3) Series V140 Pota-Pox Plus (Tnemec).

- i. Galvanized Primer:
 - 1) Speedhide White Galvanizing Primer (Pittsburgh).
 - 2) Pro Industrial Pro-Cryl (Sherwin Williams).
 - 3) Series L69 Hi-Build Epoxoline II (Tnemec).

- j. Latex Enamel:
 - 1) Speedhide Acrylic Latex Semi-Gloss Enamel (Pittsburgh).
 - 2) Pro Industrial Acrylic Semi-Gloss (Sherwin Williams).
 - 3) Series 1028 Enduratone (Tnemec).

- k. Latex Filler:
 - 1) Speedhide Block Filler (Pittsburgh).
 - 2) Pro Industrial Heavy-Duty Block Filler (Sherwin Williams).
 - 3) Series 130 Envirofill (Tnemec).

- l. Latex Sealer:
 - 1) Speedhide Quick Drying Interior Latex Primer/Sealer (Pittsburgh).
 - 2) Pro Max 200 Zero VOC Latex Primer (Sherwin Williams).
 - 3) Series 115 (Tnemec)

- m. Polysiloxane:
 - 1) Carboxane 2000 (Gloss) (Carboline).
 - 2) Sher-loxane 800 (Gloss) (Sherwin Williams).

- n. Submerged Epoxy:
 - 1) Pitt-Guard 97 (Pittsburgh).
 - 2) Series 145 DTR (Pittsburgh).
 - 3) Macropoxy 646 (Sherwin Williams).
 - 4) Series L69 Hi-Build Epoxoline II (Tnemec).
 - 5) Series 104 HS (Tnemec).
- o. Universal Primer:
 - 1) Multiprime 97-680 Primer (Pittsburgh).
 - 2) Macropoxy 646 (Sherwin Williams).
 - 3) Chembuild 135 (Tnemec).
- p. Urethane Semi-Gloss:
 - 1) Carbothane 133 LV (Carboline).
 - 2) HS Polyurethane 250 (Sherwin Williams).
 - 3) Series 750 EnduraShield (Tnemec).
- q. Wood Primer:
 - 1) Seal Grip (Pittsburgh).
 - 2) Exterior Latex Wood Primer (Sherwin Williams).
 - 3) Elasto-Grip Series 151 (Tnemec).
- r. Zinc Primer:
 - 1) Zinc Clad III HS (Sherwin Williams).

2.2 PAINT SYSTEMS

A. Metal Surfaces:

- 1. Manufactured primed/painted equipment – interior exposure:
 - a. Metal Trim System:
 - 1) Includes: Metal trim, including metal louvers, skylight frames, metal doors, and metal frames.
 - 2) Color: Beige.
 - 3) Surface Prep: Primer Touch-Up. Touch-up with Universal Primer manufacturer-primed items that are not finish painted and apply Hard Acrylic Satin. Galvanized surfaces that are not factory primed shall be primed with one coat of Galvanized Primer prior to applying Hard Acrylic Satin.
 - 4) Paint Material:
 - a) Hard Acrylic Satin: 2 coats; 4 mils minimum.

- b. Exposed Metal System:
 - 1) Includes: Piping, valves, pumps, motors, bases, and supports.
 - 2) Color: Beige or Pipe Color Coding System, as applicable.
 - 3) Surface Prep: Clean, dry.
 - 4) Paint Material:
 - a) Universal Primer: 1 coat; 3 mils minimum. Touch-up with Universal Primer manufacturers primed items that are not finish painted and apply Hard Acrylic Satin or Acrylic Epoxy. Items that are finish painted by the manufacturers may be acceptable as furnished or may need to be top coated with Hard Acrylic Satin or Acrylic Epoxy at the discretion of the Engineer.
 - b) Hard Acrylic Satin: 2 coats, 4 mils minimum.
- 2. Industrial Metal System:
 - a. Includes: Equipment platforms, exterior surfaces of tanks, bins, hoppers, stairways, ladders, and railings.
 - b. Color: Beige.
 - c. Surface Prep: SP10. Anchor pattern of blast to be 2 mils.
 - d. Paint Material:
 - 1) Zinc Primer, 1 coat, 2 mils minimum.
 - 2) Epoxy Intermediate: 1 coat, 3 mils minimum.
 - 3) Urethane Semi-gloss: 2 coats, 4 mils minimum.
- 3. Galvanized Metal Conditioning:
 - a. All galvanized surfaces (including hot-dipped galvanized surfaces, electro galvanized surfaces, and cadmium-plated surfaces) requiring painting shall be prepared and primed with the Galvanized Primer.
- 4. Fusion Bonded Epoxy Coating:
 - a. Includes: All exposed fusion bonded epoxy coated surfaces of steel water pipe, fittings, and flow meter.
 - b. Color: Pipe Color Coding System.
 - c. Surface Prep: Light sanding with 100 grit sandpaper.
 - d. Paint Material:
 - 1) Urethane Semi-Gloss: 1 coat, 4 mils minimum.
 - 2) Hard Acrylic Satin (Interior or exterior use): 2 coats, 4 mils minimum.
- 5. Metal Insulation System:
 - a. Includes: items located outdoors or in submerged, splash zone, or damp areas. All dissimilar metals in contact with each other and all aluminum surfaces in contact with concrete, or masonry.
 - b. Surface Prep: SP1; 100 grit sandpaper.

- c. Paint Material:
 - 1) Epoxy DTR: 1 coat, 5 mils minimum.
 - 2) An approved self-adhering tape (10 mils).

- 6. Outdoor Iron Pipe System:
 - a. Includes: Ductile iron or cast-iron pipe that is not submerged or in a splash zone area but is exposed and is located outdoors and is required to be painted for purposes of aesthetics, piping color coding, etc.
 - b. Color: Beige or Pipe Color Coding System, as applicable.
 - c. Surface Prep: SP6. If piping is located in a location where sandblasting is not permitted, then the surface preparation shall be power or hand sanding followed with solvent cleaning to remove all traces of the pipe manufacturer-applied bituminous coating.
 - d. Paint Material:
 - 1) Epoxy DTR: 1 coat, 4 mils, minimum.
 - 2) Hard Acrylic Satin: 2 coats, 4 mils minimum.

- 7. Indoor Iron Pipe System:
 - a. Includes: Ductile iron or cast-iron pipe that is not submerged or in a splash zone area but is exposed and is in a temperature conditioned environment that requires the pipe to be painted for aesthetics or piping color coding, etc.
 - b. If the pipe is indoors but is not in a temperature conditioned environment, then it shall receive the Outdoor Iron Pipe System.
 - c. Color: Beige or Pipe Color Coding System, as applicable.
 - d. Surface Prep: SP1. The surface of the manufacturer-applied bituminous coating needs to be wire brushed and solvent wiped clean.
 - e. Paint Material:
 - 1) Epoxy DTR: 1 coat, 4 mils minimum.
 - 2) Hard Acrylic Satin: 2 coats, 4 mils minimum.

- 8. Submerged Metal System:
 - a. Includes:
 - 1) Exterior surface of the pump bowls, discharge pipes, and underside of pump bases and sole plates and other piping, brackets, and equipment below a plane 2 feet above the maximum water surface level.
 - b. Color: Gray.
 - c. Surface Prep: SP5.
 - d. Paint Material:
 - 1) Submerged Epoxy: 3 coats, 16 mils minimum.

9. Color Coding System:
- a. Includes: All exposed metal piping, including fittings, valves, pipe support, connected equipment such as pumps, motors, tanks, etc.
 - b. Piping System (Colors refer to Tnemec Colors):
 - 1) Treatment Units, Treated Water and Backwash Supply: Delft Blue.
 - 2) Raw Water: Pleasant Pond Green.
 - 3) Backwash Drain: Umber Brown.
 - 4) Low Pressure Air: Confederate Gray.
 - 5) Chlorine Gas Conduit: OSHA Bright Yellow.
 - 6) Equipment Safety Guards: OSHA Safety Orange.
 - 7) Copper Sample Lines: Not color coded.

B. Masonry Surfaces:

1. Sealed Concrete Block System:
- a. Includes: Interior and exterior of the building block walls, except for the interior surfaces of the Chlorine Room, which are specified in Chlorine Room Masonry System.
 - b. Surface Prep: Water blast then wait until dry.
 - c. Paint Material:
 - 1) Clear Sealer:
 - a) Exterior: 2 coats, 50 SFPGPC minimum.
 - b) Interior: 1 coat, 50 SFPG minimum.
2. Chlorine Room Masonry System:
- a. Includes: Masonry walls in the chlorine room.
 - b. Color: Ivory.
 - c. Surface Prep: Clean, dry.
 - d. Paint Material (Apply to masonry walls with long-nap, shed-resistant roller, and squeegee for smooth finish.):
 - 1) Latex Filler: 1 coat, 75 SFPG minimum.
 - 2) Acrylic Epoxy: 2 coats, 250 SFPGPC minimum.

C. Concrete Surfaces:

1. Chlorine Room Floor:
- a. Includes: Concrete floor of the Chlorine Room with chlorine solution dispensing system.
 - b. Color: Gray.
 - c. Surface Prep: Acid etch with muriatic acid. If the floor slab was cured with liquid curing compound, the surface must be cleaned by sandblasting which would eliminate the need for the acid etch treatment.

d. Paint Material:

- 1) Epoxy Primer: 1 coat, 200 SFPG minimum. After applying Epoxy Primer, broadcast 16-mesh sand onto wet coat. Sweep off excess sand prior to applying Epoxy Finish.
- 2) Epoxy Finish: 1 coat, 200 SFPG minimum. Apply with shed resistant roller prior to the installation of floor-mounted equipment.

D. Wood Surfaces:

1. Interior and Exterior Wood System:

- a. Includes: All exposed wood.
- b. Color: Beige, unless otherwise selected by owner, except exterior fascia's beams and rake boards shall be dark brown, unless otherwise selected by Owner.
- c. Surface Prep: Clean, dry.
- d. Paint Material:
 - 1) Wood Primer: 1 coat, 300 SFPG minimum. Metal framing hardware and fasteners shall be primed with one coat of Galvanized Primer in Lieu of the Wood Primer.
 - 2) Acrylic Satin: 1 coat, 300 SFPGPC minimum.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and substrate conditions are ready to receive Work as recommended by product manufacturer prior to commencing Work.
- B. Examine surfaces scheduled to be finished prior to commencement of Work, and report conditions capable of affecting proper application and overall performance of coating system, in writing, to Engineer.
- C. Do not proceed with work until such condition have been corrected. Commencing with work indicates acceptance of existing conditions and for responsibility for performance of applied coating.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Moisture Content:
 1. Measure moisture content of surfaces using electronic moisture meter.
 2. Do not apply finishes unless moisture content of surfaces is below following maximums:
 - a. Plaster and Gypsum Wallboard: 12 percent.
 - b. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 - c. Interior Wood: 15 percent, measured according to ASTM D4442.
 - d. Exterior Wood: 15 percent, measured according to ASTM D4442.
 - e. Concrete Floors: 8 percent.

3.2 PROTECTION

- A. Extreme diligence shall be taken to ensure that vehicles, equipment, hardware, fixtures, materials, etc., are protected against paint spillage, overspray, etc. Such damages shall be corrected at no expense to Owner.
- B. Surfaces not to be coated shall be masked, removed, or otherwise covered to protect against cleaning and coating application procedures. Drop cloths shall be used to protect floors, walls, machinery, equipment, and previously coated surfaces.
- C. Exercise care in erecting, bracing, handling, and dismantling staging and scaffolding, to avoid scratching or damaging walls, floors, equipment, etc.
- D. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

3.3 PREPARATION

- A. Perform preparation procedures in strict accordance with manufacturer's instructions for each substrate condition.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Prepare coatings as follows:
 - 1. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.
 - 2. For smooth flow and brushing properties.
- D. Defects:
 - 1. Correct defects and clean surfaces capable of affecting Work of this Section.
 - 2. Remove or repair existing coatings exhibiting surface defects.
- E. Marks: Seal marks that may bleed through surface finishes with shellac.
- F. Impervious Surfaces:
 - 1. Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach.
 - 2. Rinse with clean water and allow surface to dry.
- G. Metal Surfaces Scheduled for Paint Finish:
 - 1. General:
 - a. Metal surfaces shall be prepared as listed in the section regarding Paint Systems, Metal Surfaces included herein.
 - b. Metal surfaces shall be cleaned of all oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning or painting.

- c. All exposed sharp edges on outdoor or submerged items shall be rounded, all burrs, jagged edges, and surface defects shall be ground smooth.
 - d. Shop primed items shall comply with the above items prior to touch-up painting of field painting.
2. Cleaning:
- a. Abrasive blast cleaning shall not be performed whenever the relative humidity exceeds 85 percent, nor whenever the surface temperature is within 5° F above the dew point of the ambient air and the temperature is falling.
 - 1) Dehumidifiers may be used to control the humidity.
 - b. The Contractor shall comply with applicable State and local air pollution control regulations for blast cleaning.
 - c. All surfaces shall be cleaned of dust and residual particles of the cleaning operations by brushing and air blast cleaning supplemented with vacuuming of the dust laden air prior to painting.
 - d. Enclosed areas and other areas where dust settling is a problem shall be vacuum cleaned and wiped clean with a tack cloth.
 - e. Surfaces shall be painted within eight hours after the start of cleaning operations or sooner, if required, to preclude surface rusting.
 - 1) Surfaces that have started to rust before they are painted shall be reblasted.
 - 2) A temporary holding primer or rust inhibitor compatible with the specified primer may be used by the Contractor provided written approvals and instructions for its use are submitted by the paint manufacturer of the specified primer.
 - f. Galvanized metals requiring paint shall be cleaned by removing all oil, grease, dirt, dust and foreign matter by solvent cleaning in accordance with SSPC-SP1 prior to applying the specified primer.
 - g. Aluminum Surfaces:
 - 1) Remove surface contamination by steam or high-pressure water.
 - 2) Remove oxidation with acid etch and solvent washing.
 - 3) Apply etching primer immediately following cleaning.
 - h. Copper Surfaces:
 - 1) Remove contamination by steam, high-pressure water, or solvent washing.
 - 2) Apply vinyl-etch primer immediately following cleaning.
 - i. Copper Surfaces Scheduled for Natural Oxidized Finish:
 - 1) Remove contamination by applying oxidizing solution of copper acetate and ammonium chloride in acetic acid.
 - 2) Rub on repeatedly for required effect, and, once attained, rinse surfaces with clear water and allow to dry.

- j. Uncoated Steel and Iron Surfaces:
 - 1) Remove grease, mill scale, weld splatter, dirt, and rust.
 - 2) If heavy coatings of scale are evident, remove by hand, power tool, wire brushing, or by sandblasting.
 - 3) Clean by washing with solvent.
 - 4) Apply treatment of phosphoric acid solution, ensuring that weld joints, bolts, and nuts are similarly cleaned.
 - 5) Spot-prime paint after repairs.
- k. Shop-Primed Steel Surfaces:
 - 1) Sand and scrape to remove loose primer and rust.
 - 2) Feather edges to make touch-up patches inconspicuous.
 - 3) Clean surfaces with solvent.
 - 4) Prime bare steel surfaces.
- l. Metal Doors Scheduled for Painting: Prime metal door at top and bottom edge surfaces.

H. Masonry Surfaces Scheduled for Paint Finish:

- 1. Cleaning:
 - a. Exterior masonry surfaces receiving either the Clear Sealer or the Hi-Build Elastomere Paint shall first be cleaned by water blasting.
 - 1) After the surface is dry, it shall be inspected for cracks.
 - a) Cracks shall be sealed in accordance with recommendations of the of the paint manufacturer.
 - b. Interior masonry surfaces to be painted shall have all surface contaminants removed by means that will not adversely affect proximate equipment, etc.
 - 1) Remove all mortar protrusions and surface defects using a carborundum stone or other approved means.
 - 2) Backfilled walls shall be tested for moisture with a 2-foot-square, 10 mil clear polyethylene sheet securely taped around the perimeter.
 - a) The underlying area shall be dry for 18 hours before being painted.

I. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.

J. Concrete Surfaces:

- 1. General:
 - a. All exposed concrete surfaces shall have all form oil and other surface contaminants removed.
 - b. Mortar fins plugged from the cones and other protrusions should be ground flesh.

- c. Concrete surfaces receiving either the Epoxy Sealer or the Epoxy Primer/Epoxy Finish shall then be dry sandblasted to remove the weak surface layer of the concrete and expose all bug holes, hone-combed areas, and other such voids and defects.
 - d. Surfaces shall be brushed and vacuumed to remove all contaminants.
2. Surface Voids:
- a. Surface voids in excess of 1/16-inch shall be trowel-filled with an epoxy mortar compatible with the epoxy sealer or epoxy primer.
 - b. After the epoxy mortar has cured, the first coat of epoxy sealer or primer shall be applied by trowel and spread with a squeegee to a uniform thickness.
 - c. After the first coat has cured, the second coat shall also be applied by trowel and spread with a squeegee to a uniform thickness.
3. Moisture Test:
- a. The surface shall be tested for moisture before any coating work begins.
 - 1) Unless otherwise approved, 2-foot by 2-foot square piece of 10 mil polyethylene sheeting shall be taped to two areas of each wall and the floor.
 - 2) The perimeter of each sheet shall be taped with duct tape.
 - 3) If the underlying concrete surface is dry after 18 hours, the concrete is ready to be coated.
 - 4) If not, the concrete must be dried longer, and the test must be repeated until there is no evidence of moisture.
4. Concrete Floors:
- a. Remove contamination, acid etch, and rinse floors with clear water.
 - b. Verify that required acid-alkali balance is achieved.
 - c. Allow to dry.
- K. Wood Surfaces:
1. General:
- a. Exposed lumber and plywood shall have all knots sealed with a knot sealer recommended by the manufacturer of the applicable paint system.
 - b. All splits, cracks, and checks shall be filled with a putty recommended by the manufacturer of the applicable paint system.
 - c. All nails shall be flush with the surface of the wood.
 - d. The moisture content of the wood shall be 15 percent maximum when the primer is applied unless a lower moisture content is required by the paint manufacturer.
- L. Interior Wood Items Scheduled to Receive Paint Finish:
- 1. Wipe off dust and grit prior to priming.
 - 2. Seal knots, pitch streaks, and sappy sections with sealer.
 - 3. Fill nail holes and cracks after primer has dried.
 - 4. Sand between coats.

M. Exterior Wood Scheduled to Receive Paint Finish:

1. Remove dust, grit, and foreign matter.
2. Seal knots, pitch streaks, and sappy sections.
3. Fill nail holes with tinted exterior paintable calking compound after prime coat has been applied.

3.4 APPLICATION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. All coatings shall be applied in strict accordance with the PDS and CPAS.
- C. Do not apply finishes to surfaces that are not dry.
- D. Apply each coat to uniform appearance.
- E. Apply each coat of paint slightly darker than preceding coat, unless specified otherwise.
- F. Sand wood and metal surfaces lightly between coats to achieve required finish.
- G. Cleaning:
1. Vacuum surfaces to remove loose particles.
 2. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Fillers:
1. If clear finishes are required, tint fillers to match wood.
 2. Work fillers into grain before set, and wipe excess from surface.
- I. Concealed Surfaces:
1. Prime concealed surfaces of interior and exterior woodwork with primer paint.
 2. Prime concealed surfaces of interior wood surfaces scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with thinner.
- J. Finishing Mechanical and Electrical Equipment:
1. Paint shop-primed equipment.
 2. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components, and paint separately.
 3. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, and collars and supports, except where these items are shop finished.
 4. Paint interior surfaces of air ducts visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 5. Paint dampers exposed behind louvers, grilles, to match face panels.
 6. Paint exposed conduit and electrical equipment installed in finished areas.

7. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
 8. Color-Coding:
 - a. Color-code equipment, piping, conduit, and exposed duct work according to Owner requirements.
 - b. Color band and identify with flow arrows, names, and numbering.
 9. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings that were removed prior to finishing.
- K. Coverage:
1. Spreading Rates:
 - a. Listed As: Either the total minimum dry film thickness in mils for a particular paint material, or the spreading rate in square feet per gallon (SFPG).
 - 1) The spreading rate for multiple coats is listed in square feet per gallon per coat (SFPGPC).
 - b. Based On: 80 percent efficiency of application.
 2. Actual coverage may differ depending on the texture and porosity of the surface.
 3. Coats:
 - a. The number of coats is the minimum required irrespective of the applied coating thickness.
 - b. Additional coats may be required to obtain the minimum required paint thickness, depending on the method of application, differences in manufacturer's products, and atmospheric conditions.
 - c. Maximum film build per coat shall not exceed the coating manufacturer's recommendations.
- L. Ventilation:
1. Maintain proper ventilation in area of work to alleviate volatile solvents evaporating from coating materials.
- M. Mixing:
1. All ingredients in any container of the coating materials shall be thoroughly mixed and shall be agitated often enough during application to keep the pigment suspended.
- N. Thinning:
1. Should thinning be required, use only the amounts specified by the coating manufacturer.

- O. Application of coatings shall be by brush, roller, mitt, or spray and in accordance with manufacturer's recommendations.
 - 1. All materials shall be evenly applied to form a smooth, continuous, unbroken coating.
 - 2. Drips, runs, sags, or pinholes shall not be acceptable.
- P. Equipment:
 - 1. Provide proper application equipment, including ladders, scaffolding, masking materials, and tools to perform work.
 - 2. Ladders and Scaffolding shall meet or exceed UL requirements and Metal Ladder Manufacturer's Association.
- Q. Meet all requirements set forth by California Occupational Safety and Health Act (Cal OSHA), including those for confined spaces.

3.5 SYSTEM INSPECTION AND TESTING

- A. Ferrous Surfaces:
 - 1. Coating thickness specified in mils will have each coat of primer, intermediate and finish checked for thickness conformance using an electronic gauge such as PosiTector 6000 manufactured by DeFelski Corp., Ogdensburg, NY; or an Elcometer 456 manufactured by Elcometer, Inc., Rochester Hills, MI.
 - 2. The Microtest reading shall be reduced by 2 mil or an amount determined by the Engineer which more accurately accounts for the depth of the surface profile.
- B. Number and Location of Thickness Measurements:
 - 1. Determined by: Engineer.
 - 2. Number: Approximately equal to the ratio of one measurement for each 100 square feet of painted surface but not less than two measurements for each surface.
- C. Metallic surfaces placed in immersion service shall have the coating checked for discontinuities using a low voltage wet sponge holiday detector such as Model M-1, manufactured by Tinker and Razor, San Gabriel, CA.
- D. Masonry, drywall, or other non-metallic surfaces shall be continuously checked with a wet-film thickness gauges during application to ensure proper dry film thickness will be attained.
 - 1. Also, square feet coverage needs to be monitored to verify proper coverage rates.
- E. Painting contractor shall permit Owner's Representative and/or paint and coating manufacturer (as requested by Owner) to inspect his work for conformance to this specification.
- F. Owner reserves the right to reject all work that does not comply with this specification.

3.6 FIELD QUALITY CONTROL

- A. Inspecting and Testing: Comply with MPI - Architectural Painting Manual.

3.7 CLEANING

- A. Collect waste material that may constitute fire hazards, place in closed metal containers, and remove daily from Site.
- B. Upon completion, painting contractor shall clean up and remove from site all surplus materials, tools, appliances, empty cans, cartons, and rubbish resulting from painting work. Site shall be left in neat, orderly condition.
- C. Remove all protective drop cloths and masking from surfaces not being painted.
- D. Provide touch-up around same areas as directed by Owner's Representative.
- E. Remove all misplaced paint splatters or drippings resulting from this work.

END OF SECTION 099000



Phone: 530/244-0202
 FAX: 530/244-1978

COATING PREPARATION AND APPLICATION SHEET (CPAS)

NOTE: This form together with the Manufacturer's Technical Data Sheet and the product Material Safety Data Sheet (MSDS) constitute the Manufacturer's Shop Drawing Coating Submittal, and will be considered to be the manufacturer's recommendations for coating application purposes.

COATING MANUFACTURER

Manufacturer's Name _____
 Address _____
 Name, Phone, and Fax Number of Manufacturer's Representative who completed this form _____ Date _____

Phone: _____ Fax: _____

COATING IDENTIFICATION

Product Name and Number _____
 Generic Type and Description _____
 Recommended Thinner _____
 Recommended Cleaner _____

STORAGE AND MIXING CRITERIA

Shelf Life @ 75°F _____
 Storage Temperature (°F) Min. _____ Max. _____ Preferred _____

Product Temp.	40°F		60°F		80°F		100°F	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Mixing Time								
Sweating Time								
Pot Life								
*Thinning								

Special Mixing Instructions - such as: type of mixing equipment, blending procedure of the various components, etc. _____

*State maximum or minimum amounts of thinner in quarts per gallon permitted.

If thinning is dependent upon methods of application, state accordingly _____

SURFACE PREPARATION

Uncoated Surfaces

Metals:

Recommended surface profile (range) _____ mils

Concrete, Masonry, Plaster, Wood:

Maximum surface moisture (%) _____

Acceptable range of pH _____

Surface moisture allowed (i.e., dry, damp, condensate, wet, etc.) _____

Previously Coated Surface

Required surface preparation when not recoated within the recommended recoat time (i.e., solvent wiping, brush off blasting, water blasting, etc. State recommended solvent and methods.) _____

APPLICATION CRITERIA

Method of Application (state preferred and unacceptable methods)

Brush: (type and length of bristle, etc.) _____

Roller: (type and length of nap, type of backing, etc.) _____

*Conventional Spray: (tip size, air cap, hose material & size, etc.) _____

*Airless Spray: (pump size, tip size, tip pressure, hose material and size, etc.) _____

*Equipment information may be provided on Technical Data Sheet in lieu of this space.

Atmospheric Condition During Application

	Minimum	Maximum	Preferred
Relative Humidity (%)			
Ambient Air Temperature (°F)			
Surface Temperature (°F)			
Wind Velocity (mph)	N.A.		N.A.

Film Thickness

To obtain the specified dry film thickness, the required wet film thickness is _____ mils.

Film thickness limitations per coat (wet film):

maximum thickness _____ mils⁽¹⁾

minimum thickness _____ mils

Nonvolatile solids content (% volume) _____ %

VOC Emissions _____ (mg/L)

⁽¹⁾ If the maximum thickness is exceeded, the dry film will be compromised and will be removed and reapplied by the Contractor at his expense.

CURING/DRYING CRITERIA⁽²⁾

TIME						
TEMPERATURE (air or Surface) °F	TOUCH	HANDLE/ TRAFFIC	RECOAT		SUBMERSION	
	MINIMUM	MINIMUM	MIN	MAX	POTABLE WATER MINIMUM	SEWAGE MINIMUM
40						
60						
80						
100						
120						

⁽²⁾ If this information is not contained in the PDS it shall be provided by the technical department.

Effect of moisture while coating is curing/drying (is rainfall or water harmful, if so, within what time period) _____

Is moisture required for proper curing? _____ If so, explain: _____

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Backdraft dampers.
 - 2. Duct accessory hardware.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Certifications as required to comply with American Iron and Steel (AIS) provisions.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
 - 1. Product data showing compliance with ASHRAE 62.1.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Operation and maintenance data.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise

indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.2 MATERIALS

- A. Galvanized Sheet Steel: Comply with ASTM A 653.
 - 1. Galvanized Coating Designation: G60.
 - 2. Exposed-Surface Finish: Mill phosphatized.
- B. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and finish for exposed ducts.
- C. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 BACKDRAFT DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Greenheck Fan Corporation.
 - 2. Ruskin Company.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description: Gravity balanced with mounting flange and bird screen.
- C. Maximum System Pressure: 1-inch wg.
- D. Frame: Hat-shaped, with welded corners or mechanically attached and mounting flange.
- E. Blades: Multiple single-piece blades, center pivoted, maximum 3-inch width, 0.05-inch-thick, roll-formed aluminum or 0.05-inch-thick aluminum sheet with sealed edges.
- F. Blade Action: Parallel.
- G. Blade Seals: Extruded vinyl.
- H. Blade Axles:
 - 1. Material: Aluminum.
- I. Tie Bars and Brackets: Aluminum.
- J. Type: Gravity.
- K. Bearings: Synthetic pivot bushings.

L. Accessories:

1. Adjustment device to permit setting for varying differential static pressure.
2. Counterweights.
3. 90-degree stops.

2.4 DUCT ACCESSORY HARDWARE

- A. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized steel accessories in galvanized steel and fibrous glass ducts.
- C. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.2 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 1. Operate dampers to verify full range of movement.

END OF SECTION 233300

SECTION 233400 - HVAC FANS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Centrifugal wall fans.

B. Related Sections:

1. Section 233300 - Air Duct Accessories: Product requirements for duct accessories for placement by this section.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCES

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Bearing Manufacturers Association:

1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

C. Air Movement and Control Association International, Inc.:

1. AMCA 99 - Standards Handbook.
2. AMCA 204 - Balance Quality and Vibration Levels for Fans.
3. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
4. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
5. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.

D. National Electrical Manufacturers Association:

1. NEMA MG 1 - Motors and Generators.
2. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

E. Underwriters Laboratories Inc.:

1. UL 705 - Power Ventilators.

1.4 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Only request submittals needed to verify compliance Project requirements.
- C. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- D. Product Data: Submit data on each type of fan and include accessories, fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.
- E. Manufacturer's Installation Instructions: Submit fan manufacturer instructions.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.6 QUALITY ASSURANCE

- A. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300.
- C. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- D. Balance Quality: Conform to AMCA 204.
- E. Perform Work in accordance with 2019 California Mechanical Code.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years' documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Protect motors, shafts, and bearings from weather and construction dust.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL WALL FANS

- A. Manufacturers:
 - 1. Greenheck.
 - 2. Loren Cook.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Fan Unit: Direct drive with spun aluminum housing; resiliently mounted motor; aluminum wire bird screen.
- C. Motor: Open drip proof.
- D. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor NEMA 250 Type 1 enclosure.
- E. Accessories:
 - 1. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked.
- F. Performance: Per schedule.
- G. Electrical Characteristics and Components: Per schedule.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Secure centrifugal wall fans to wall with wall bracket or curb.
- B. Install bird screen where inlet or outlet is exposed.
- C. Install Work in accordance with 2019 California Mechanical Code.
- D. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.2 CLEANING

- A. Vacuum inside of fan.

3.3 DEMONSTRATION

- A. Demonstrate fan operation and maintenance procedures.

3.4 PROTECTION OF FINISHED WORK

- A. Do not operate fans until ductwork is clean, filters are in place, bearings lubricated, and fan has been test-run under observation.

END OF SECTION 233400

SECTION 233750 - AIR LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Louvers.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCES

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.
- B. Air Movement and Control Association International, Inc.:
 1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

1.4 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: Submit sizes, finish, and type of mounting.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of air outlets and inlets.

1.6 QUALITY ASSURANCE

- A. Test and rate louver performance in accordance with AMCA 500.

PART 2 - PRODUCTS

2.1 LOUVERS

- A. Manufacturers:
 - 1. Greenheck.
 - 2. Ruskin.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Description: Stationary, drainable.
- C. Type: 6-inch deep with radial-shaped blades and heavy channel frame.
- D. Fabrication: 0.081-inch-thick extruded aluminum, welded assembly, with mill finish, ready to paint. Match finish color to building wall. Space blades at 3¼-inch on center.
- E. Mounting: Furnish with anchor/attachment system and flanges that are compatible with building system construction type and acceptable to the Engineer.
- F. Screen: Bird screen with 3/4-inch x 0.051-inch-thick flattened, expanded aluminum in removable frame, on wall louvers. Internal aluminum insect screen on gable louvers.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify inlet and outlet locations.
- B. Verify wall systems are ready for installation.

3.2 INSTALLATION

- A. Install diffusers to ductwork with airtight connection.
- B. Paint visible portion of ductwork behind air outlets and inlets matte black.
- C. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

END OF SECTION 233750

SECTION 235400 - FURNACES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Electric furnaces.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- C. Product Data: Submit rated capacities, efficiencies, weights, required clearances, locations and sizes of field connections, accessories, electrical nameplate data, and wiring diagrams.

1.4 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of furnaces, components, and connections.

1.5 QUALITY ASSURANCE

- A. Minimum Furnace Efficiency:
 1. Comply with ASHRAE/IES 90.1.
- B. Furnish equipment that is UL listed as suitable for clearance space available in installed location.

PART 2 - PRODUCTS

2.1 ELECTRIC FURNACES

- A. Manufacturers:

1. Subject to compliance with requirements, provide products by one of the following:
 - a. Modine.
 - b. Reznor.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 1. Self-contained, packaged, factory-assembled, pre-wired unit consisting of cabinet, supply fan, heating element, controls and accessories.
- C. Cabinet:
 1. Material: Steel with baked enamel finish.
 2. Access Doors:
 - a. Removable.
 - b. Furnish glass-fiber insulation and reflective liner.
- D. Supply Fan:
 1. Type: Centrifugal.
 2. Mounting: Rubberized.
 3. Operation: Direct drive.
- E. Motors:
 1. Speed: Single.
- F. Electric Heater: Helix-wound, bare nichrome-wire elements arranged in incremental stages with porcelain insulators.
- G. Operating Controls:
 1. Analog Thermostat: Line-voltage adjustable room thermostat.
 2. High-Limit Temperature Control: De-energize heating elements and automatic resets.
 3. Supply Fan:
 - a. Starts simultaneously with electric elements or after they are energized and continue operating until thermostat is satisfied or until outlet air temperature reaches minimum setting.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. According to manufacturer instructions.

B. Power and Controls:

1. Connect units to electric supply.
2. Connect controls remote from units.
3. Install control components supplied with equipment and provide control wiring.
4. Install control wiring between thermostat and indoor unit.

C. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

END OF SECTION 235400

SECTION 255003 - FLOW METERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Electromagnetic flow meters.
2. Transmitters.
3. Indicators.

B. Related Requirements:

1. Section 260533 - Raceways and Boxes for Electrical Systems.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

A. American Water Works Association:

1. AWWA C704 - Propeller-Type Meters for Waterworks Applications.
2. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.
3. AWWA M33 - Flowmeters in Water Supply.

B. ASME International:

1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.

C. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts maximum)

D. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

- B. Coordinate Work of this Section with Division 40 specifications.

1.5 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: Submit manufacturer information for system materials and component equipment, including connection requirements.
- C. Shop Drawings:
 - 1. Indicate system materials and component equipment.
 - 2. Submit installation requirements and other details.

1.6 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record configuration settings of equipment including, but not limited to, 4 to 20 mA setpoints, flow display settings, etc.

1.7 QUALITY ASSURANCE

- A. Ensure that materials of construction of wetted parts are compatible with process liquid.
- B. Materials in Contact with Potable Water: Certified to NSF 61 and NSF 372.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store equipment according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.10 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Furnish two-year manufacturer's warranty for magnetic flow meters and appurtenant devices.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Furnish sensors, field preamplifiers, signal conditioners, offset and span adjustments, amplifiers, transducers, transmitters, control devices, interconnecting cables, and unit conversions and algorithms as required for application.

2.2 ELECTROMAGNETIC FLOW METERS

- A. Manufacturers:
 - 1. McCrometer, Ultra Mag.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Function: Measure, indicate, and transmit the flow rate of a process liquid in a full pipe.
 - 2. Type: Electromagnetic flow meter, with operation based on Faraday's law, utilizing the pulsed DC type coil excitation principle with high impedance electrodes.
 - 3. Parts: Flow element, transmitter, interconnecting cables, grounding rings, and mounting hardware.
- C. Service:
 - 1. Stream Fluid: Potable water.
- D. Performance:
 - 1. Flow Range: 0-340 GPM.
 - 2. Velocity Range: 0.2 To 32 feet per second (FPS).
 - 3. Accuracy: 0.5% of rate.
 - a. Accuracy shall be maintained with 90- or 45-degree elbows, valves, partially opened valves, one pipe diameters upstream and zero pipe diameters downstream.
 - 4. Turndown Ratio: Minimum of 100 to 1 when flow velocity at minimum flow is at least 1-foot per second.
 - 5. Repeatability: 0.05%.
 - 6. Working Pressure Rating: 150 psi.
 - 7. Temperature Range: 14° to 140°F.

- E. Features:
 - 1. Zero stability feature to eliminate the need to stop flow to check zero alignment.
 - 2. No obstructions to flow.
- F. Process Connection:
 - 1. Meter Size: Two inches.
 - 2. Connection Type: Steel AWWA Class D flat face flanges.
 - 3. Flange Material: Carbon steel.
- G. Signal Interface: Two 4 to 20 mA DC for load impedance 0 to 800 ohms minimum for 24 VDC supply.
- H. Power: 120 VAC, 60 Hz.
- I. Element:
 - 1. Meter Tube Material: 304 stainless steel.
 - 2. Liner Material: NSF-approved fusion-bonded epoxy.
 - 3. Liner Protectors: Covers on each end to protect liner during shipment.
 - 4. Electrode Type: Flush or bullet nose.
 - 5. Electrode Material: 316 stainless steel.
 - 6. Enclosure: NEMA 6P, unless otherwise noted.
 - 7. Grounding Ring/Electrode Material: 316 stainless steel.
 - 8. Grounding rings are required for all sizes.
- J. Transmitter:
 - 1. Display: 32-character, indicating and totalizing.
 - 2. Mounting: Integral to flowmeter.
 - 3. Zero and Span: Field adjustable.
 - 4. Indicator: Digital display, with scale range as noted.
 - 5. Totalizer: Digital display.
- K. Cables:
 - 1. Types: As recommended by manufacturer.
 - 2. Lengths: As required to accommodate device locations.
- L. Calibration System:
 - 1. Features:
 - a. Field programmable electronics.
 - b. Self-diagnostics with trouble shooting codes.
 - c. Ability to program electronics with full scale flow, engineering units, meter size, zero flow cutoff, desired signal damping, etc.

- M. Electrodes:
 - 1. Flush or bullet nose, Type 316L stainless steel.
 - 2. Self-cleaning.
- N. Accuracy: Plus or minus 1 percent of actual flow rate over a 10:1 range.
- O. Provide adjustment for zero and span.
- P. Accessories:
 - 1. Furnish cable between transmitter and receiver.
 - 2. Grounding kit with grounding rings.

2.3 SOURCE QUALITY CONTROL

- A. Provide shop inspection and testing of meters according to AWWA M6.
- B. Certificate of Compliance:
 - 1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
 - 2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that items provided by other Sections of Work are ready to receive Work of this Section.

3.2 INSTALLATION

- A. Coordinate location and orientation of flow meter with final equipment installations.
- B. Ensure that instruments are located to be easily accessible for maintenance.
- C. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.3 FIELD QUALITY CONTROL

- A. Section 259000 - ORT and FAT Requirements.

B. Testing:

1. Test and calibrate flow meter to demonstrate that it meets specified accuracy requirements. For additional requirements see Section 259000 - ORT and FAT testing requirements.
2. Comply with AWWA M6.

C. Equipment Acceptance:

1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
2. Make final adjustments to equipment under direction of manufacturer's representative.

D. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

3.4 DEMONSTRATION

- A. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

END OF SECTION 255003

SECTION 259000 - ORT AND FAT REQUIREMENTS

PART 1 - GENERAL

1.1 SYSTEM OPERATION

- A. See Supplement No. 2 - Functional Descriptions for a description of the system operation. The system shall operate as described, and any changes to the system operation shall be approved by the EEOR.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

3.1 TESTING

- A. Operational Readiness Test (ORT):
 1. The entire installed I&C system shall be certified (inspected, tested, and documented) that it is ready for operation. The objective of this test is to demonstrate that the I&C system is ready for functional acceptance testing. The ORT shall be completed, documented, and submitted to the engineer prior to commencing with the functional acceptance test. See Supplement No. 1 - Example ORT Form for an example of an acceptable set of ORT forms.
 2. Point-to-Point Wire Check: After installation, termination, and identification of conductors, perform a point-to-point wire check to verify that all wiring has been properly installed and identified and that there are no shorts between wires, shields, and ground. Lift conductors from terminals as required to perform this test.
 - a. Sequence Test: The sequence test is a step-by-step check of a control circuit to verify that the circuit does function as shown on the elementary diagrams and schematic diagrams.
 - 1) The test is performed with control busses energized. Load elements (relay coils, indicating lights, solenoid valves, etc.) are energized and de energized by opening and closing contacts in the circuit leading to each load element. Each contact is checked individually, either by actual operation of the contact, or if that is not practical, by simulated operation of the contact, or, if that is not practical, by simulated operation of the contact (removing a wire or shorting the contact).
 - 2) The sequence test is performed by going through the elementary diagrams on a line-by-line basis. As each circuit is checked, the drawing is marked with a colored pen. The objective is to confirm that the control circuitry agrees with the elementary diagrams. Corrections shall be made as required to the circuitry and to the Drawings. The end item is the set of marked-up elementary diagrams.

- 3) Simulate operation of remote devices by opening or jumpering control circuits.

B. Functional Acceptance Testing (FAT):

1. Testing:

- a. Testing shall be scheduled and performed in accordance with the requirements detailed in the Engineer's Supplementary Conditions.
- b. After the Contractor has completed all required ORT documentation, manufacturer startups, and equipment calibrations, the engineer shall be notified for approval of ORT and startup documentation.
- c. Contractor shall then provide written permission to PACE to perform pre-FAT by powering and starting/operating their equipment along with notification that all supplied equipment, system documentation, and O&M manuals are on-site and available. PACE shall begin this pre-FAT only after receiving these notifications. The Contractor and PACE shall establish a written schedule as to when PACE will be on-site to conduct pre-FAT. Contractor shall have a representative on-site that has operational knowledge of the equipment and is authorized to operate the equipment. If Contractor chooses not to have someone on-site and PACE is there when scheduled, then permission to operate needs to be granted with this acknowledgement. Granting permission to PACE to start operation of the equipment in no way relieves the Contractor from providing a fully functional system. The Contractor shall remain responsible for all supplied equipment and materials during pre-FAT.
- d. If it is determined that the Contractor's equipment is malfunctioning, PACE will notify the Contractor of the malfunction and may need to cease all pre-FAT efforts until the Contractor can correct the malfunction.
- e. When pre-FAT is complete, PACE shall perform the FAT along with the Contractor and Owner's representatives. PACE is responsible for developing FAT documentation that will be used during on-site testing. The Contractor shall build 2 weeks into his schedule of work that includes PACE's FAT efforts. This additional time shall fall within the contract time schedule.
- f. The FAT shall test all modes of operation as described in the Functional Descriptions. During this testing, it is required that all project equipment, including but not limited to pumps, motors, valves, instrumentation, and panels be operated to verify conformance to the Contract Documents.
- g. The Contractor shall remain responsible for all supplied equipment during the FAT. PACE shall not be liable for any actual or perceived damage that occurs during integration or functional testing.

- C. Any changes to wiring or product changes shall be documented in the respective documents such as O&M manuals, ORT forms, etc.

3.2 SUPPLEMENTS

- A. Supplements listed below are part of this Specification.

1. SUPPLEMENT NO. 1 – Example ORT Form.
2. SUPPLEMENT NO. 2 – Functional Descriptions.

END OF SECTION 259000

SUPPLEMENT NO. 1

EXAMPLE
ORT FORM

PACE ENGINEERING OPERATIONAL READINESS TEST (ORT) - INSTRUMENT CALIBRATION

COMPONENT	MANUFACTURER	PROJECT
Name:	Name:	Name:
	Model:	Number:
	Serial No.:	

FUNCTIONS

	Range	Units	Control? Y/N
Indicate? Y/N			Action? Direct/Reverse
Record? Y/N			Switch? Y/N Unit Range: Differential: Reset? Automatic/Manual
Transmit? Y/N			

ANALOG CALIBRATIONS	DISCRETE CALIBRATIONS
---------------------	-----------------------

REQUIRED			AS CALIBRATED				REQUIRED		As Calibrated	
			Increasing Input		Decreasing Input		Trip Point	Reset Point	Trip Point	Reset Point
Input	Indicated	Output	Indicated	Output	Indicated	Output	(Note rising or falling)		(Note rising or falling)	

NOTES:	Component Calibrated and Ready for Start-up
	By:
	Date:

SUPPLEMENT NO. 2
FUNCTIONAL DESCRIPTIONS

LEWISTON COMMUNITY SERVICES DISTRICT **FUNCTIONAL DESCRIPTIONS, TRENDING REQUIREMENTS, AND** **SCADA VISUALIZATION**

1.0 Well Site

1.1 Site Description

Water will be collected from the well, dosed with chlorine, and pumped into the distribution system and up to the South Tank. Well flow will be monitored with a magnetic flowmeter. A chemical dosing pump shall supply 12.5% sodium hypochlorite and only operate while the well pump is running. The well pump will be powered and controlled with an across-the-line motor starter panel.

1.2 Process Equipment

Well Pump, Well Flow Meter, Dosing Pump

1.3 Automatic Operation

SCADA allows the user to configure four unique start/stop level setpoints for the four wells in a LEAD/LAG1/LAG2/LAG3 configuration. Well rotation shall occur automatically when enabled in SCADA. The pump control panel shall have a HAND-OFF-AUTO (HOA) switch mounted to the front. When in local AUTO, the well pump shall operate based upon SCADA. SCADA shall have an AUTO-MANUAL switch and a START-STOP switch on the Well 8 control screen. When selected for SCADA MANUAL, the pump shall operate based upon the SCADA START-STOP switch position, regardless of the lead storage tank level. When selected for SCADA AUTO, the well pump shall operate based upon the lead storage tank level. As the tank level falls below an operator-adjustable ON setpoint, the well pump shall be called to run until the tank level fills above an operator-adjustable OFF setpoint. The setpoint that controls Well 8 is dependent on Well 8's position in the alternating well sequence (LEAD, LAG1, LAG2, or LAG3).

The dosing pump shall automatically operate only while the well pump is ON, regardless of the local HOA switch position or SCADA control. Dosing setpoints and other methods of control shall occur locally at the dosing pump.

Automatic operation shall be unavailable when communication between the well and tank site is lost.

1.4 Manual Operation

The pump control panel shall have an HOA switch. When the pump is locally selected for HAND or OFF, the pump shall remain ON or OFF, respectively, regardless of the tank level.

The dosing pump shall contain a dial for manual speed control.

1.5 Alarms

Each of the following alarms shall be indicated in SCADA. The following alarms shall be generated:

1. **Pump Not in AUTO Alarm:** If the local well pump HOA switch is not in the AUTO position for an operator-adjustable time delay, an alarm shall be activated. The alarm shall be dialed out to notify operators. The alarm shall be reset when the well pump is selected for AUTO locally.
2. **Pump Overload Alarm:** When the well pump motor starter detects an overload condition, a pump overload alarm shall be activated. When a pump overload alarm is activated, the pump shall be prevented from operating. The alarm shall be dialed out to notify operators. The alarm shall be reset locally at the pump starter panel.
3. **Pump Fail to Start Alarm:** When the pump is locally selected for AUTO and called to run from SCADA and no pump running status is received after an operator-adjustable time delay, an alarm shall be activated. The alarm shall be dialed out to notify operations. The alarm shall be reset by taking the pump out of local AUTO.
4. **Power FAIL Alarm:** The well control panel power shall be monitored, and a power FAIL alarm shall be activated upon a loss of power. The alarm shall be dialed out to notify operators. The alarm shall be reset once power is restored.
5. **UPS FAIL Alarm:** The well control panel UPS power shall be monitored, and a UPS FAIL alarm shall be activated upon loss of power from the UPS. The alarm shall be reset once UPS power is restored.
6. **Communication FAIL Alarm:** When radio communication between the well and tank fails, a COMM FAIL alarm shall be activated. The alarm shall be dialed out to notify operators. The alarm shall be reset when communication is reestablished. The well pump shall be prevented from operating in AUTO while the COMM FAIL alarm is active.
7. **Phase High Transducer Alarm:** Each phase of motor power shall be monitored and displayed in SCADA. If measured current for a phase is greater than an operator-adjustable setpoint for an operator-adjustable time delay, an alarm shall be activated. This alarm is to monitor current that is outside the transducers' normal range. The alarm shall reset when phase current falls below the alarm setpoint. There shall be a unique alarm per phase.

8. **Phase High Lockout Alarm:** If measured current for a phase is greater than an operator-adjustable setpoint for an operator-adjustable time delay, an alarm shall be activated. This alarm is to monitor current that is close to motor's maximum current without being damaged. The pump shall be prevented from operating automatically while the alarm is active. The alarm shall be reset by taking the pump out of local AUTO. There shall be a unique alarm per phase.
9. **Phase High Alarm:** If measured current for a phase is greater than an operator-adjustable setpoint for an operator-adjustable time delay, an alarm shall be activated. The alarm shall be reset when phase current falls below the operator-adjustable setpoint. There shall be a unique alarm per phase.
10. **Phase Low Alarm:** If measured current for a phase is lower than an operator adjustable setpoint for an operator-adjustable time delay while the pump is running, an alarm shall be activated. The alarm shall be reset when phase current rises above the operator-adjustable setpoint or the pump stops running. There shall be a unique alarm per phase.
11. **Phase Low Transducer Alarm:** If measured current for a phase is less than an operator-adjustable setpoint for an operator-adjustable time delay, an alarm shall be activated. This alarm is to monitor current that is outside the transducers' normal range. The alarm shall reset when phase current rises above the alarm setpoint. There shall be a unique alarm per phase.

1.6 Trending

The following shall be historized and available for trending:

- Well Pump ON Status
- Well Phase Currents (A, B, and C)
- Well Flow
- Total Well Flow

2.0 Trending and Reporting

2.1 Trending

Trending Timeline:	
Every 30 seconds	Flows: GPM and MGD
Change of state	Discrete signals, internal alarms

2.2 Reporting

Must have daily flow totals (automatically reset/rollover at midnight) and total accumulating flow. This data is used for regulatory reporting.

3.0 SCADA Visualization

3.1 Overview Screen

1. Well Site – Well pump status (ON/OFF) and alarm halo must be visible on SCADA.

3.2 Well Screen

Layout and status of the site process.

1. Pump:
 - a. Local Control Status: AUTO/Not In AUTO
 - b. SCADA Control Status: PLC Manual/PLC Automatic
 - c. Phase Current (xx.x Amps)
 - d. Status Indicator: ON/OFF
 - e. ETM (xxx Hours): (non-resettable, today's, yesterday's, resettable)
 - f. Number of Pump Starts: (non-resettable, today's, yesterday's, resettable)
 - g. ETM Reset pushbutton
 - h. Number of Pump Start Reset pushbutton
2. Alarm:
 - a. Alarm setpoints, time delays, alarm ENABLE/DISABLE toggle pushbutton

3.3 PLC/SCADA Communications Screen

1. Well 8 PLC – Well 8 communication status and total amount of successful communication polls.

3.4 Alarm Screens

1. Alarm History Screen – Shows all active alarms, inactive alarms, unacknowledged and acknowledged.
2. Alarm Summary Screen – Shows all unacknowledged alarms.

3.5 Trending Screen

See Section 2.0 Trending and Reporting for what must be visible.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Twisted shielded pair (TSP) cable.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 DEFINITIONS

- A. MOCP: Maximum overcurrent protection.
- B. MCA: Minimum circuit ampacity.
- C. Exposed: On or attached to the surface or behind panels designed to allow access. Raceways and cables in unfinished basements in accessible underfloor areas or attics; or behind, above, or below panels designed to allow access; and that may be removed without damage to the building structure or finish are considered exposed.
- D. Concealed: Rendered inaccessible by the structure of finish of the building. Raceways and cables supported or located within hollow frames or permanently enclosed by the finish of buildings are considered concealed.

1.4 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

1.5 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.6 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.7 ACTION SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: For each type of product.

1.8 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Southwire Company.
 - 2. Okonite.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- C. Standards:
 - 1. Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and use.
 - 2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 or ASTM B496 for stranded conductors.
- E. Conductor Insulation:
 - 1. Type THHN and Type THWN-2: Comply with UL 83.

2.2 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and use.

- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. 3M Electrical Products.
 2. Greaves.
 3. Hubbell Power Systems, Inc.
 4. Ideal Industries, Inc.
 5. ILSCO.
 6. NSi Industries LLC.
 7. Thomas & Betts Corporation; A Member of the ABB Group.
 8. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 9. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
1. Material: Copper.
 2. Type: One or two-hole with standard or long barrels.
 3. Termination: Compression.
- E. Splices shall be in accordance with the CEC and UL Listing.
- F. Above Ground Splices for No. 10 AWG and Smaller:
1. Solderless, screw-on, reusable pressure cable type, with integral insulation, approved for copper and aluminum conductors.
 2. The integral insulator shall have a skirt to completely cover the stripped conductors.
 3. The number, size, and combination of conductors used with the connector, as listed on the manufacturer's packaging, shall be strictly followed.
- G. Above Ground Splices for No. 8 AWG to No. 4/0 AWG:
1. Compression, hex screw, or bolt clamp-type of high conductivity and corrosion-resistant material, listed for use with copper and aluminum conductors.
 2. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
 3. Splice and insulation shall be product of the same manufacturer.
- H. Underground Splices for No. 10 AWG and Smaller:
1. Solderless, screw-on, reusable pressure cable type, with integral insulation. Listed for wet locations and approved for copper and aluminum conductors.
 2. The integral insulator shall have a skirt to completely cover the stripped conductors.
 3. The number, size, and combination of conductors used with the connector, as listed on the manufacturer's packaging, shall be strictly followed.
 4. Submersible-type.
 5. Standards: ANSI C119.1 and C119.4 for Class A underground.
 6. Multicable pedestals allowed.

- I. Underground Splices for No. 8 AWG and Larger:
 1. Mechanical type, of high conductivity and corrosion-resistant material. Listed for wet locations and approved for copper and aluminum conductors.
 2. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
 3. Splice and insulation shall be product of the same manufacturer.
 4. Plastic electrical insulating tape: Per ASTM D2304, flame-retardant, cold, and weather resistant.
 5. Submersible-type.
 6. Standards: ANSI C119.1 and C119.4 for Class A underground.
 7. Multicable pedestals allowed.

2.3 TWISTED SHIELDED PAIR (TSP) CABLE

- A. General:
 1. Type: TC, meeting requirements of UL 1277 and CEC, Article 340, or UL 13 Listed Power Limited Circuit Cable meeting requirements of CEC, Article 725.
 2. Permanently and legibly marked with manufacturer's name, maximum working voltage for which cable was tested, type of cable, and UL listing mark.
 3. Suitable for installation in open air, in cable trays, or conduit.
 4. Minimum temperature rating: 90°C dry locations, 75°C wet locations.
 5. Passes vertical tray flame test.
 6. Overall Outer Jacket: PVC, flame-retardant, sunlight- and oil-resistant.
- B. Type 1 – No. 16 AWG, Twisted, Shielded Pair, Instrumentation Cable: Single pair, designed for noise rejection for process control, computer, or data log applications meeting requirements for UL types CL2 and CL3.
 1. Outer Jacket: 35-mil nominal thickness.
 2. Individual Pair Shield: 1.35-mil, double-faced aluminum/synthetic polymer overlapped to provide 100% coverage.
 3. Dimension: 0.26-inch nominal OD.
- C. Conductors:
 1. Bare soft annealed copper, Class B, seven-strand concentric, meeting requirements of ASTM B8.
 2. 20 AWG, seven-strand tinned copper drain wire.
 3. Insulation: 15-mil nominal PVC.
 4. Color Code: Pair conductors black and clear.

2.4 TWISTED PAIR CABLE HARDWARE

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Belden Inc.
 2. Berk-Tek Leviton; a Nexans/Leviton alliance.
 3. General Cable; General Cable Corporation.
 4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description: Hardware designed to connect, splice, and terminate twisted pair copper communications cable.

PART 3 - EXECUTION

3.1 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

3.2 INSTALLATION

- A. Comply with:
1. CEC Chapter 2 for Wiring and Protection.
 2. CEC Chapter 3 for Wiring Methods and Materials.
 3. NECA 1: Standard Practices for Good Workmanship in Electrical Construction.
 4. NECA 101 Standard for Installing Steel Conduits (RMC, IMC, EMT).
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. The contractor shall verify MOCP and MCA requirements with the listing and labeling of each piece of equipment or device delivered to the field and determine if the feeder or branch circuit is compliant with the listing and labeling. Comply with CEC 110.3 and 422.60. The contractor shall inform the EEOR of any discrepancies.
- D. It is assumed that all terminations in the field shall have minimum rated 75°C rated terminals. The contractor shall field verify all terminals for connection in compliance with CEC 110.14. The contractor shall inform the Engineer of Record of any terminals deviating from 75°C. All conductors are rated for 75°C on plans unless otherwise noted.

3.3 CONDUCTOR MATERIAL APPLICATIONS

- A. Branch Circuits and Feeders: THHN/THWN-2 Copper; solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.4 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Feeders: Concealed or exposed: Type THHN/THWN-2, single conductors in raceway.
- B. Branch Circuits:
 - 1. General:
 - a. Branch circuits shall be routed as single conductors in raceway from the panelboard until reaching the room, space, device, or equipment served.
 - b. The use of flexible raceway to equipment, appliances, surface and lay-in luminaires and devices shall be limited to 6'-0".
 - 2. Exposed Branch Circuits not readily visible (typ. above ceiling or other similar spaces) without removal of an access panel: Type THHN/THWN-2.
 - 3. Exposed Branch Circuits readily visible: Type THHN/THWN-2, single conductors in raceway.
 - 4. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2.
 - 5. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
 - 6. Branch Circuits Installed below Raised Flooring: Type THHN/THWN-2.
- C. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application. Comply with CEC Article 400.

3.5 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer with a minimum separation of 0'-6". Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with fire-alarm system to terminal blocks. Mark each terminal

according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

- G. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes; cabinets; or equipment enclosures where circuit connections are made.
- H. Color-Coding: Color-code Division 27 and Division 28 conductors differently from normal building power wiring.

3.6 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.
 - 1. Comply with CEC 110.14.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.7 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 Identification for Electrical Systems.

3.8 FIELD QUALITY CONTROL

- A. Perform Tests and Inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors and all conductors #6 AWG and larger.
 - a. The cabling system shall be certified (inspected, tested, and documented) that it is ready for operation.
 - 1) Insulation Resistance Test:
 - a) Perform insulation resistance test on each conductor #6 AWG and larger with respect to ground. Applied potential to be 1,000 VDC for one minute.
 - b) Record test values and submit to the Engineer. Insulation resistance to be 50 megohm, minimum.
 - c) Measure insulation resistance of complete circuits with the breakers open.

- b. Forms: Example ORT forms are provided in the supplement at the end of this section.

END OF SECTION 260519

SUPPLEMENT NO. 1
EXAMPLE
ORT FORMS

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DEFINITIONS

- A. Structure: That which is built or constructed, other than equipment (CEC Article 100).
- B. EGC: Equipment ground conductor.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.6 ACTION SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: For each type of product indicated.

1.7 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B3.
 - 2. Stranded Conductors: ASTM B8.
 - 3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 4. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.2 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
- D. Conduit Grounding Hubs: Mechanical type, terminal with threaded hub.
- E. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex-head bolt.
- F. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.
- G. Water Pipe Clamps:
 - 1. Mechanical type, two pieces with stainless-steel bolts.
 - a. Material: Tin-plated aluminum.
 - b. Listed for direct burial.
 - 2. U-bolt type with malleable-iron clamp and copper ground connector rated for direct burial.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet.
- B. UFER Ground: See construction drawing electrical details.

2.4 INTERSYSTEM GROUNDING BUSBAR

- A. Predrilled, wall-mounted, rectangular bars of hard-drawn solid copper, 1/4"x4"x20" in cross section, length as indicated on Drawings.
 - 1. Predrilling shall be with holes for use with cable lugs.
 - 2. Mounting Hardware: Stand-off brackets that provide a minimum 2.5-inch clearance to access the rear of the busbar. Brackets and bolts shall be stainless steel.
 - 3. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.

PART 3 - EXECUTION

3.1 COMPLY WITH CEC ARTICLE 250.

3.2 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors.
 - 3. Connections to Structural Steel: Bolted Connectors.
- C. Grounding Conductors: Green insulation.

3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- C. Expansion, expansion-deflection, or deflection fittings and telescoping sections of metal raceways shall be made electrically continuous by equipment bonding jumpers or other means (CEC 250.98).
 - 1. Expansion Couplings:
 - a. Weatherproof and approved for use indoors or outdoors.
 - b. Internal bonding springs and metallic bushings to create high integrity internal ground connection.
 - c. UL Listed for wet locations.

d. Certifications and compliance:

- 1) UL Standard 514B.
- 2) CSA 22.2 No. 18 3-12.
- 3) NEMA FB 1.
- 4) Wet locations.

D. Underground Equipment Grounding Conductors:

1. Bury at least 30 inches below grade.
2. Bare tinned copper conductor sized according to the largest feeder routed with the underground duct per CEC Table 250.66 for pullboxes.
3. Conductor shall run the length of underground trench duct and be exothermically bonded to steel pullbox covers and mechanically bonded to steel, enclosures poles, (etc.) using listed and labeled materials for the use.
4. Pullboxes and parking lot poles are considered structures. For any structure containing more than one circuit (which may be 1Ø or 3Ø in accordance with CEC 250.32), provide and install (1) ground rod at each structure in addition to the underground EGC.
 - a. Provide ground rod within the pullbox. Exothermically weld the EGC to the ground rod.
 - b. At light pole locations, provide the ground rod within the pole base or coil (1) 20'-0" UFER ground within the pole base from top to bottom. Exothermically weld the EGC to the ground rod or UFER ground. The bonding conductor from the pole shall be mechanically fastened to the pole and exothermically welded ground rod or UFER ground using #6 bare tinned conductor, minimum. Use non-reversible mechanical direct-bury grounding clamps to bond the #6 bare tinned conductor to all metal materials at the light pole cage. All mechanical fasteners shall be listed and labeled for the use.
 - c. A ground rod shall not be required for structures having only one circuit as defined by CEC 250.32 (A), Exception 1. The EGC shall still be required to bond metal parts in pullboxes and light poles. For light poles, the EGC routed with the branch circuit may be used as the EGC at the light pole. For pullboxes, the underground EGC shall be used to bond the lid.
5. Equipment grounding conductors at pullboxes and vaults that are exothermically welded at the lid shall allow contain 5'-0" of slack so that the lid may be laid adjacent to the pullbox on the ground for service or maintenance within the pullbox.

E. Indoor Grounding of Low-Voltage Transformers: Provide and install in accordance with CEC requirements and the drawings.

F. Outdoor Grounding of Low-Voltage Transformers: Provide and install (2) ground rods spaced a minimum of 6'-0" from the other. Each ground rod shall have the top of the ground rod buried 6" beneath grade into the earth. Ground rods shall be exothermically welded to the grounding electrode conductor. The grounding electrode conductor shall be routed to the primary and secondary sides of the transformer where they shall be landed at conduit grounding hubs (if applicable) and the neutral ground.

3.4 FENCE GROUNDING

- A. Fence Grounding: Install at maximum intervals of 1500 feet except as follows:
 - 1. Fences within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet.
 - a. Gates and Other Fence Openings: Ground fence on each side of opening.
 - 1) Bond metal gates to gate posts.
 - 2) Bond across openings, with and without gates, except at openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet on each side of crossing.
- C. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.
- D. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- E. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.

3.5 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Concrete-Encased Grounding Electrode (UFER Ground): Fabricate according to CEC; use a minimum of 20 feet of bare copper conductor (size as indicated on plans).
 - 1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
- D. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. Use exothermic welds for all below-grade connections.

- E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations.
- F. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 - 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- G. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.
- H. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

3.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Report measured ground resistances that exceed the following values:
 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
 4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).
 5. Substations and Pad-Mounted Equipment: 5 ohms.
- E. Prepare test and inspection reports.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.
- G. See attached Supplement No. 1 for ORT Forms.

END OF SECTION 260526

SUPPLEMENT NO. 1
EXAMPLE
ORT FORMS

GROUND RESISTANCE TEST REPORT

Project:	Location:	Date:
		Tested By:

Test Method:	Two Point	Test Equipment Used:
	Fall of Potential	

GROUND DESIGNATION	OHMS	GROUND DESIGNATION	OHMS	GROUND DESIGNATION	OHMS	GROUND DESIGNATION	OHMS

NOTES:

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel slotted support systems.
2. Conduit and cable support devices.
3. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.6 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches on center in at least one surface.
1. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.

2. Material for Channel, Fittings, and Accessories: Stainless steel, Type 304 Stainless steel.
 3. Channel Width: Selected for applicable load criteria.
 4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 5. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 6. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
 7. Comply with 2019 CBC Chapter 16A and ASCE 7-16 Mechanical Equipment Anchorage Requirements.
- B. Conduit and Cable Support Devices: Stainless-steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened Portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 3. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
 4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325.
 5. Hanger Rods: Threaded galvanized steel.
 6. Raceway spring steel clamps listed and suitable for the use.

PART 3 - EXECUTION

3.1 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

3.2 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
1. NECA 1 (Good Workmanship Standards).
 2. NECA 101 (Metallic Raceway Standards).
 3. NECA 111 (Nonmetallic Raceway Standards).
 4. California Electric Code 300.19 and Table 300.19 (A) for vertical cable supports.

- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, and RMC as required by CEC. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.3 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Raceway Support Methods: In addition to methods described in NECA 1, EMT IMC and RMC may be supported by openings through structure members, according to CEC.
- D. Strength of Support Assemblies: Where indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- E. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
 - 6. To Light Steel: Sheet metal screws.
 - 7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.
- F. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.4 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.5 CEILING FIXTURES, TERMINALS, AND DEVICES

- A. All fixtures, terminals and other devices shall be mounted in a manner that will not compromise ceiling performance in accordance with Section 13.5.6.2.2 Item 5 of ASCE 7 as amended by CBC Section 1616A.1.20 (1616.10.16*) and ASTM E580 Sections 5.3 and 5.4.
- B. Ceiling panels shall not support any light fixtures or devices.

3.6 CONCRETE

- A. Construct concrete pads, foundations and bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 4000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements shall be per Structural and Architectural contract documents.
- C. Anchor Equipment to Concrete Base as Follows:
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.7 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Specification Division 09 and Architectural plan sheets for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

END OF SECTION 260529

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Conduit and fittings.
2. Metal wireways and auxiliary gutters.
3. Boxes, enclosures, and cabinets.
4. Pullboxes and handholes.
5. Above ground enclosures.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCES

- A. See Section 260544 - Sleeves and Sleeve Seals for Electrical Raceways and Cabling.
- B. See Section 260519 - Low Voltage Electrical Power Conductors and Cables. Section 260519 may supersede Section 260533, Part 3, Section 3.1.

1.4 DEFINITIONS

- A. RMC: Rigid Metallic Conduit.
- B. PVC: Rigid Polyvinyl Chloride Conduit.
- C. LFMC: Liquid-tight Flexible Metal Conduit.
- D. Concealed: Rendered inaccessible by the structure or finish of the building. Raceways and cables supported or located within hollow frames or permanently enclosed by the finish of buildings are considered concealed.
- E. Exposed: On or attached to the surface or behind panels designed to allow access. Raceways and cables in unfinished basements in accessible underfloor areas or attics; or behind, above, or below
- F. Auxiliary Gutter: A sheet metal enclosure used to supplement wiring spaces at meter centers, distribution centers, switchgear, switchboards, and similar points of wiring systems. The enclosure has hinged or removable covers for housing and protecting electrical wires, cables, and busbars. The enclosure is designed for conductors to be laid or set in place after the enclosures have been installed as a complete system (CEC 366.2).

- G. Gutter: A sheet metal enclosure used for wiring spaces at meter centers, distribution centers, switchgear, switchboards, and similar points of wiring systems.
- H. Enclosure: a space within an above ground box to which raceways terminate and wire space is given to redirect, splice, or terminate to power distribution blocks (CEC 314.28). Cabinets and enclosures are typically equipped with hinged doors that may be lockable, or gasketed.
- I. Pullbox: Underground box to which raceways terminate and wire space is given to redirect or splice conductors.
- J. Wireway: Sheet metal troughs with hinged or removable covers for housing and protecting electrical wires and cable and in which conductors are laid in place after the raceway has been installed as a complete system (CEC 376.2).
- K. Cabinet: A space in which to mount devices or other equipment. Cabinets and enclosures are typically equipped with hinged doors that may be lockable, or gasketed.
- L. Vault: A room or space not accessible to unauthorized personnel typically enclosed by concrete walls, floor, and ceiling with a minimum fire rating of three hours.

1.5 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

1.6 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.7 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Certifications as required to comply with American Iron and Steel (AIS) provisions.

1.8 ACTION SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: For all products.

1.9 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.

PART 2 - PRODUCTS

2.1 CONDUITS AND FITTINGS

A. General:

1. Listing and Labeling: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application. Comply with NEMA FB 1 and UL 514B.
2. Fittings shall be listed and labeled for type of conduit, location, and use.
3. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and CEC.
4. Nonmetallic conduit shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

B. RMC:

1. Rigid galvanized threaded.
2. Comply with ANSI C80.1 and UL 6.
3. Joint Compound for RMC: Approved, as defined in CEC, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

C. LFMC:

1. Liquid tight steel or iron.
2. Flexible steel conduit with PVC jacket and complying with UL 360.

D. PVC:

1. Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
2. Fittings to match conduit type.
3. Solvents and adhesive shall be as recommended by conduit manufacturer.
4. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions. Steel expansion fittings shall be outfitted by a braided bonding jumper listed for the use.

E. PVC Coated RMC: Comply with ANSI C80.1, ETL PVC-001, NEMA RN 1, and UL 6.

1. Coating Thickness: 0.040 inch (1 mm), minimum.
2. A "PVC Coated Sealing Locknut" shall be used on all exposed male threads transitioning into female NPT threads which do not have sealing sleeves, including transitions from PVC couplings/female adapters to PVC coated RMC elbows in direct burial applications. "PVC Coated Sealing Locknuts" are not to be used in place of a conduit hub.
3. PVC-Coated Fittings:
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide products by one of the following:
 - 1) Korkap.
 - 2) Perma-Cote.

3) Plasti-Bond.

- b. Fittings shall be Form 8 with a V-Seal tongue-in-groove gasket and supplied with plastic encapsulated stainless steel cover screws. Form 8 fittings shall be UL Type 4X listed and IEC IP69 certified. Fittings shall be from the same manufacturer as the conduit in order to maintain system continuity and warranty. PVC Coated fittings for hazardous locations must be UL 1203 listed after the coating is applied and have a red metal tag attached to the fitting to signify compliance.

2.2 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 12 unless otherwise indicated, and sized according to CEC.
1. Metal wireways installed outdoors shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- C. Wireway Covers: Screw-cover type unless otherwise indicated.
- D. Finish: Manufacturer's standard enamel finish.

2.3 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets:
1. Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- D. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- E. Device Box Dimensions:
1. General: 4 inches square by 2-1/8 inches deep.
2. For Cat6A cable installation: 5-Square box.

2.4 PULLBOXES AND HANDHOLES

A. General Requirements for Underground Pullboxes and Handholes:

1. Pullboxes for use in underground systems shall be designed and identified as defined in CEC, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

B. Underground Polymer-Concrete Pullboxes:

1. Polymer-Concrete Cover: Used in non-rated traffic areas: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
2. Steel Cover: Used in traffic-rated areas: H20 AASHTO M309, skid resistant and marked. Frame to be reinforced concrete with steel frame.
3. Configuration: Designed for flush burial with **[open]** **[closed]** **[integral closed]** bottom unless otherwise indicated.
4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
6. Cover Legend: Molded lettering, "ELECTRIC", or "FIRE ALARM" or "COMMUNICATION" as shown on Drawings.
7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
8. Precast concrete structures shall be designed and constructed in accordance with ASTM C857 and ASTM C858. Concrete compressive strength at 28 days shall not be less than 3,000 PSI.
9. Extension rings: as required.
10. Pullboxes providing entry for line and low-voltage systems shall incorporate a pullbox divider separation.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

2.5 ABOVE GROUND ENCLOSURES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work is limited to the following:

1. Gaylord Manufacturing.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. General Requirements for Above Ground Enclosures:

1. Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Cabinets:

1. NEMA 250, Type 3R galvanized-steel box.
2. Hinged doors in front with flush latch and concealed hinge.
3. Key latch to match switchboards.

PART 3 - EXECUTION

3.1 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

3.2 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit not Subject to damage: RMC.
2. Exposed Conduit Subject to damage: RMC.
3. Concealed Conduit, Aboveground: RMC.
4. Underground Conduit: PVC Type 40.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
6. Boxes, Wireways and Enclosures, Aboveground: NEMA 250, Type 3R.

- B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit not Subject to damage: RMC.
2. Exposed Conduit Subject to damage: RMC.
3. Concealed in Ceilings and Interior Walls and Partitions: RMC.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

- C. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid Steel Conduit: Comply with NEMA FB 2.10.
2. EMT: Comply with NEMA FB 2.10.
3. Flexible Conduit: Comply with NEMA FB 2.20.

3.3 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with CEC limitations for types of raceways allowed in specific occupancies and number of floors.

- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Wireways shall be installed per CEC Article 376.
- D. Raceways shall be installed in compliance with the manufacturer installation instructions, this Section and relevant CEC Articles listed below:
 - 1. RMC: CEC Article 344.
 - 2. FMC: CEC Article 348.
 - 3. LFMC: CEC Article 350.
 - 4. PVC: CEC Article 352.
 - 5. PVC Coated RMC: CEC 300.6; 344.
- E. For metallic and nonmetallic surface mounted raceways, comply with CEC Articles 386 through 388.
- F. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- G. Complete raceway installation before starting conductor installation.
- H. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- I. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- J. Make bends in raceway using large-radius preformed ells. Field bending shall be according to CEC minimum radii requirements. Use only equipment specifically designed for material and size involved.
- K. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- L. Support conduit within 36 inches of boxes, cabinets, and enclosures to which attached.
- M. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
- N. Stub-Ups to Above Recessed Ceilings:
 - 1. Use 1" RMC for raceway.

2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
 3. Stub ups shall be installed for every data box location shown in Drawings.
- O. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- P. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- Q. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated throat metal grounding bushings on service conduits.
- R. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- S. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- T. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- U. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- V. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- W. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- X. Horizontally separate boxes mounted on opposite sides of walls, so they are not in the same vertical channel.
- Y. Locate boxes so that cover or plate will not span different building finishes.
- Z. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- AA. Fasten junction and pullboxes to or support from building structure. Do not support boxes by conduits.

3.4 INSTALLATION OF UNDERGROUND CONDUIT

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

B. Direct-Buried Conduit:

1. All work performed in the field shall comply with CEC Article 300.5(A) through 300.5(F).
2. Comply with minimum coverage in accordance with CEC Table 300.5.
3. Compacted trench backfill shall be 95% relative compaction per ASTM D1557 Maximum Dry Density.
4. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in contract documents.
5. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
6. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

3.5 INSTALLATION OF UNDERGROUND PULLBOXES

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. Install pullboxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- C. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- D. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.
- F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

END OF SECTION 260533

SECTION 279000 - RADIO SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Antenna cable.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work of this Section with Division 25 and Division 26 specifications.

1.4 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: Submit manufacturer information for system materials and component equipment, including connection requirements.
- C. Shop Drawings:
 1. Indicate system materials and component equipment.
 2. Submit installation requirements and other details.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store equipment according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.8 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 ANTENNA CABLE

- A. Manufacturers:
 - 1. Tessco.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Features:
 - 1. Type: LMR 400 Cable.
 - 2. Application: Outdoor.
 - 3. Cable OD: 0.405 inches.
 - 4. Operating Temperature: -40 to 185° F.
 - 5. Impedence: 50 Ohm.
- C. Include all required mounting hardware, connectors, and fittings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that items provided by other Sections of Work are ready to receive Work of this Section.

3.2 INSTALLATION

- A. Ensure that instruments are located to be easily accessible for maintenance.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.3 FIELD QUALITY CONTROL

- A. Section 259000 - ORT and FAT Requirements.
- B. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.
- C. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

3.4 DEMONSTRATION

- A. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

END OF SECTION 279000

SECTION 312316 - EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Earthwork quantities.
2. General.
3. Archeological.
4. Dust control.
5. Blasting.
6. Dewatering.
7. Erosion control.
8. Structure and footing excavation.
9. Excavating for slabs on grade.

B. Related Requirements:

1. Section 312316.13 - Trenching: Excavating as required for building foundations and utilities within building perimeter.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.
- B. Local utility standards when working within 24 inches of utility lines.
- C. The "Greenbook" Standard Specifications for Public Works Construction (SS), 2018 Edition.
 1. SS 3-12.2 Air Pollution Control.
 2. SS 7-4 Payment for Extra Work.

1.4 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Erosion Control Plan. Refer to Engineer's Supplementary Conditions – BEST MANAGEMENT PRACTICES AND EROSION CONTROL.
- C. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Refer to Engineer's Supplementary Conditions for public utilities serving the area of work.
- C. Utility Service Locator:
 - 1. Call local utility service-line information at USA (811) not less than five working days, not including date of notification, before performing Work.
 - 2. Request that underground utilities be located and marked within and immediately surrounding construction areas.
 - 3. Identify required lines, levels, contours, and data.
- D. Existing Utilities:
 - 1. Locate and expose (pothole) existing utilities to be encountered at least three working days prior to excavation work to allow for field changes in the location of new utilities.
 - 2. Notify Engineer immediately of conflicting utilities.
 - 3. Protect from damage utilities indicated to remain.
- E. Protect plant life, lawns, and other features designated to remain as portion of final landscaping.
- F. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- G. Do not close or obstruct roadways, sidewalks, and hydrants without permits.
- H. Erect and maintain temporary barriers and security devices, including warning signs, warning lights, and similar measures, for protection of public, Owner, and existing improvements indicated to remain.

3.2 EXCAVATION

- A. Earthwork Quantities:
 - 1. The Contractor is solely responsible to make his own determination of quantities based on his own calculations, interpretations of the Drawings, and field observations.
 - 2. No extra payment for earthwork will be made to the Contractor for any actual quantity difference from these estimates, unless the scope of the work shown on the Drawings and in these Specifications is changed.

B. General:

1. Excavation is unclassified.
2. The Contractor shall excavate whatever material is encountered to the lines and grades shown on the Drawings.
3. Tops of cut slopes shall be rounded.
4. The Contractor shall furnish, install, and operate all necessary machinery, appliances, and equipment to keep excavations free of all water which would be detrimental to any phase of construction and shall dewater and dispose of the water so as not to cause injury to public or private property or to cause a nuisance or a menace to the public.

C. Archeological:

1. Refer to the Standard General Conditions and Supplementary Conditions.
2. If artifacts, exotic rock, or unusual amounts of shell or bone are uncovered during construction, work should stop in that area immediately and a qualified cultural resources specialist will be contacted by the Owner in order to evaluate the deposit.
3. If the bone found may be human, state law requires the immediate cessation of construction activities as well as immediate contact with the County Coroner and Native American Heritage Commission, Sacramento.
4. Such work stoppage will be considered Extra Work.

D. Dust Control: Refer to the Supplementary Conditions

1. No separate payment will be made for any work performed or material used to control dust resulting from the Contractor's performance of the work.
2. Full compensation for such dust control will be considered as included in the prices paid for the various items of work involved.

E. Dewatering:

1. Contractor shall control water entering the excavation such that it does not interfere with fill operations.
2. Comply with authorities having jurisdiction for water discharge and disposal from pumping operations.
3. Prevent damage to adjacent properties, buildings, structures, utilities, and other facilities from dewatering operations.
 - a. Repair damage caused by dewatering operations at no additional cost to the Owner.
4. Prevent loss of fines, quick condition, or softening of foundation subgrade.
5. Maintain stability of sides and bottoms of excavations and trenches.
6. Pump water into drainage channels according to requirements of authorities having jurisdiction.
7. Remove dewatering equipment after dewatering operations are discontinued.

F. Erosion Control:

1. Refer to Engineer's Supplementary Conditions – BEST MANAGEMENT PRACTICES AND EROSION CONTROL.

- G. Blasting:
 - 1. Blasting is not allowed.
- H. Structure and Footing Excavation:
 - 1. Excavations shall be taken to the depths shown on the Drawings.
 - 2. If soft or otherwise unsuitable material is encountered at or below Plan grade, the unsuitable material shall be removed to a depth recommended by the Engineer and replaced with structure backfill.
 - 3. The excavation and replacement of unsuitable material ordered by the Engineer will be paid for as specified in SS 7-4 PAYMENT FOR EXTRA WORK.
 - 4. Overexcavation below the slab grades shown on the Drawings caused by an act or failure to act on the part of the Contractor shall be replaced with compacted structure backfill.
 - 5. Overexcavations under footings shall be replaced with concrete of equal strength to that of the footing.
 - 6. Cuts below grade shall be corrected by similarly cutting adjoining areas and creating a smooth transition.
 - 7. The Contractor shall bear all costs for correcting overexcavated areas.
 - 8. After footing excavation has been completed, the bottom 6 inches shall be compacted to 95 percent maximum test density prior to the placement of any additional fill material or concrete.
 - 9. Rough grading shall be completed prior to excavation for footings, utilities, or other structures.
 - 10. Where pipelines enter and leave a structure, the requirement for trench excavation and backfill shall be complied with up to the excavation line of the structure, unless specified or directed otherwise.
 - 11. Excavation shall extend a sufficient distance from walls and footings to allow for placement and removal of forms, installation of services, and for inspection, except where concrete is authorized by the Engineer to be deposited directly against the excavated surface.
 - 12. Keep excavations free of all water that would be detrimental to any phase of construction and dewater and dispose of the water so as not to cause injury to public or private property or to cause a nuisance or a menace to the public.
- I. Underpin adjacent structures which may be damaged by excavation Work.
- J. Excavate subsoil to accommodate building foundations, slabs on grade, and construction operations.
- K. Excavate to working elevation for piling Work.
- L. Compact disturbed load-bearing soil in direct contact with foundations to original bearing capacity, as specified in Section 312316.13 - Trenching.
- M. Slope banks to angle of repose or less until shored.
- N. Do not interfere with two horizontal to one vertical bearing splay of foundations.
- O. Grade top perimeter of excavation to prevent surface water from draining into excavation.

- P. Trim excavation and remove loose matter.
- Q. Removal of Deleterious Materials:
 - 1. Remove lumped subsoil, boulders, and rock up to 1/3 cu. yd., measured by volume.
 - 2. Remove excess and unsuitable material from Site.
- R. Notify Engineer of unexpected subsurface conditions.
- S. Correct over-excavated areas as directed by Engineer.
- T. Remove all excavated material from Site. Comply with Trinity County Grading Ordinance No. 1347.
- U. Repair or replace items indicated to remain that have been damaged by excavation.

3.3 FIELD QUALITY CONTROL

- A. Testing: As specified in Section 312316.13 - Trenching

3.4 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation and maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that may be created by earth operations.

END OF SECTION 312316

SECTION 312316.13 - TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Trenching.
2. Bedding.
3. Backfill.

B. Related Sections:

1. Section 331413 - Public Water Utility Distribution Piping.
2. Section 331417 - Site Water Service Utility Laterals.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 012100 - Measurement and Payment.

B. Sheeting, Shoring, and Bracing of Trenches: Payment for sheeting, shoring, and bracing of trenches or equivalent means for protection of workers will be made at the Contract lump-sum price for the Work.

1.3 REFERENCE STANDARDS

A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. ASTM International:

1. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

C. California State Department of Transportation (Caltrans), 2018 Revised Standard Specification (RSS).

D. The "Greenbook" Standard Specifications for Public Works Construction (SS), 2018 Edition.

1. SS 306-3 Trench Excavation.
2. SS 306-4 Shoring and Bracing.
3. SS 201-1 Portland Cement Concrete.
4. SS 7-4 Payment for Extra Work.

1.4 DEFINITIONS

- A. Bedding: Material supporting, surrounding, and extending 6 to 12 inches above the top of the pipe as shown on the Drawings.
- B. Utility: Any buried pipe, duct, conduit, or cable.
- C. Where the word pipe is used, it shall be understood to mean pipe and/or conduit.

1.5 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Excavation Protection Plan: Refer to the Standard General Conditions and Supplementary Conditions.
- C. Erosion Control Plan. Refer to Engineer's Supplementary Conditions – BEST MANAGEMENT PRACTICES AND EROSION CONTROL.
- D. Traffic Control Plan: Refer to the Standard General Conditions and Supplementary Conditions.
- E. Grading Permit: As required by Trinity County Grading Ordinance No. 1347.
- F. Product Data: Submit manufacturer's product data sheet for all products specified.
- G. Material Data: Submit laboratory analysis, from a certified lab, as required to show conformance with these specifications.
- H. Materials Source: Submit name of all imported fill and aggregate base material suppliers.

1.6 QUALIFICATIONS

- A. Prepare excavation protection plan under direct supervision of Professional Engineer experienced in design of this work and licensed in the State of California.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.8 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. Pipe Bedding:

1. Imported clean sand or well graded sand gravel mix free from all organic matter and debris.
2. Maximum Size: $\frac{3}{4}$ -inch.
3. Minimum Sand Equivalent: 30.
4. In paved areas with pipe slope greater than two percent use a silt-sand-gravel mixture with gradation corresponding to that for Caltrans Class 2 aggregate base, $\frac{3}{4}$ -inch maximum size.

B. Aggregate Base:

1. Caltrans Class 2, $\frac{3}{4}$ -inch minus aggregate base.
2. Maximum Size: $\frac{3}{4}$ -inch.

C. Imported Gravel Backfill:

1. Reasonably well-graded silty sand or a well-graded silt, sand, and gravel mixture.
2. Maximum Particle Size: 3 inches.
3. Minimum Sand Equivalent: 30.
4. Cinders or pea gravel are not acceptable.
5. At the Contractor's option, aggregate base material may be substituted.
6. In paved areas with surface slope greater than two percent use a silt-sand-gravel mixture with gradation corresponding to that for Caltrans Class 2 aggregate base.
7. Select native material meeting the above requirements may be used, see Item [F]< ____ > included in this Section.

D. Trench Stabilization Material:

1. Clean imported gravel, free from clay balls and organic matter.
2. Reasonably well-graded from fine sand to 2½ inches maximum.
3. Gradation shall be such as to fill all large voids with fines to prevent piping of native soils.

E. Native Backfill:

1. Material excavated from the trench.
2. Free of roots and debris.
3. Remove any rocks larger than 6 inches in greatest dimension within 2 feet of top of pipe.
4. In lawn areas, the trench shall be back filled to a level 12 inches below finish grade.
5. Then topsoil shall be placed to within 1-inch of the surface.

F. Select Native Backfill:

1. Material excavated from the trench.
2. Free of roots and debris.

- 3. Remove any rocks larger than 3 inches in greatest dimension.
- 4. The burden of proof that the select native materials meet these requirements will be on the Contractor and no additional payment will be made for materials testing or material processing associated with the use of native materials.

G. Concrete:

- 1. Thrust Blocks: Class 450-C-2000 per SS 201-1.
- 2. Valve Box Collars, Curb, Gutter, Sidewalk, and Exposed Locations: Class 520-C-2500 per SS 201-1 with 4%-6% air entrainment.
- 3. Concrete Encasement: Class 450-C-2000 per SS 201-1.
- 4. Concrete Cap: Class 520-C-2500 per SS 201-1.

H. Slurry Mix:

- 1. Type II Portland Cement: 94 lbs.
- 2. Sand: 800 lbs.
- 3. 3/8-inch Graded Aggregate: 2,600 lbs.
- 4. Water: 12 gallons.

I. Filter Fabric:

- 1. Nonwicking.
- 2. Permeable.
- 3. Nonwoven polyester, nylon, or polypropylene material or any combination thereof.
- 4. Furnish a protective covering capable of protecting the fabric from ultraviolet rays, abrasion, and water prior to installation.
- 5. Filter fabric shall have the following characteristics:
 - a. Weight, ounces per square yard, minimum
ASTM Designation: D3776 4.0
 - b. Grab tensile strength (1-inch grip), pounds, minimum,
In each direction, ASTM Designation: D4632 90
 - c. Elongation at break, percent, minimum,
ASTM Designation: D4632 30
 - d. Toughness, pounds, minimum
(Percent elongation × grab tensile strength) 6,000
 - e. Permittivity, 1/sec., minimum
ASTM Designation: D4491 0.5

PART 3 - EXECUTION

3.1 LINES AND GRADES

A. Lay pipes to lines and grades indicated on Drawings.

- 1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Call Local Utility Line Information service at USA (811) not less than five working days, not including day of notification, before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- C. Existing Utilities:
 - 1. Locate and expose (pothole) the existing utilities to be encountered marked by the utility at least three working days before the excavation occurs, unless otherwise approved by the Engineer, to allow for field changes in the alignment of the new utilities.
 - a. Construct new utility mains and appurtenances in such a manner as to maintain the minimum cover requirements and utility clearance requirements as shown on the Drawings.
 - b. In some cases, new pipeline alignment may be raised to less than the normal 36-inch cover when restricted by existing utilities (26-inch absolute minimum), but in most cases it will be necessary to deepen the alignment in order to pass under the utility.
 - c. No extra payment will be due the Contractor for alignment changes (either vertical or horizontal) as may be required to clear existing utilities, unless it can be shown that such utilities have been shown or marked at incorrect locations and their actual location necessitates an increase in the scope of work.
 - 2. Protection of utilities that have been identified in the Drawings and Specifications and correctly marked by the utility operator in the field prior to construction, when required by law, will be considered to be in the normal scope of work (not extra work).
 - 3. Notify the appropriate utility company 48 hours in advance of connecting to or modifying existing utilities.
 - 4. The Contractor will be responsible for the immediate repair of any water or sewer facilities broken or damaged during construction. Service repair materials shall be kept on the job and repairs shall be performed in a manner acceptable to the Owner.
- D. Pavement Removal:
 - 1. Sawcut all bituminous pavement regardless of the thickness prior to excavation of the trenches.
 - 2. Use an approved pavement saw or other approved pavement cutter. Depth of pavement cut shall be a minimum of one-half the pavement thickness or as required to break at the cut when excavated.
 - 3. Pavement materials removed shall be hauled from the site and not used for trench backfill.
- E. Identify required lines, levels, contours, and datum locations.

F. Protection of Existing Trees and Shrubs:

1. It is the intent of these Contract Documents that the pipeline be constructed with a minimum of tree removal and disturbance of the existing landscape.
2. Do not cut or damage any trees or landscaping shrubs that are not specifically marked by the Engineer for removal.
3. All damage to trees, shrubs, and plants shall be the Contractor's responsibility.
4. To avoid damage to the tree trunks and limbs, the foliage of the trees shall be pruned as needed prior to commencement of the trenching operations. Additionally, where equipment must work in close proximity to the tree trunks, use of old tires, lumber, or other protective materials shall be temporarily placed against the trunks to protect them from injury.
5. When trenching within a zone extending from the tree trunk to a line 10 feet out beyond the drip line of trees, special attention shall be taken to avoid wrenching or otherwise damaging roots greater than 3 inches in diameter. When such roots are encountered, they shall be left intact if at all possible or cut cleanly with a saw. No roots greater than 6 inches in diameter shall be cut or damaged.
6. To avoid unnecessary compaction of soil around trees by construction equipment, construction materials shall not be stockpiled in the zone extending from the trunk to a line 10 feet out beyond the drip line of trees.

G. Protect plant life, lawns, and other features remaining as portion of final landscaping.

H. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic. If fences are removed to facilitate construction, they shall be replaced in-kind.

I. Maintain and protect above and below grade utilities indicated to remain.

J. Traffic Control:

1. Refer to the Standard General Conditions and Supplementary Conditions.
2. Submit Plan to Engineer for approval prior to performing Work.
3. Relocate controls and reroute traffic as required during progress of Work.

K. Erosion Control:

1. Refer to Engineer's Supplementary Conditions - BEST MANAGEMENT PRACTICES AND EROSION CONTROL.
2. Submit Plan to Engineer for approval prior to performing Work.

3.3 SHEETING, SHORING, AND BRACING

- A. Include SS 306-3.1 and 306-4, which will be strictly enforced. Governmental safety representatives may be notified before commencement of trenching and requested to inspect the work as it progresses.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Submit Plan to Engineer for approval prior to performing Work.

- D. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- E. Design sheeting and shoring to be removed at completion of excavation work.
- F. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.
- G. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.4 TRENCHING

- A. Trench excavation is unclassified. Complete all excavation regardless of the type of materials encountered. No extra payment will be made for rock or other difficult excavation.
- B. Trench Bottom Maximum Width: As indicated on Drawings.
- C. Trench Maximum Depth: As indicated on Drawings.
- D. Water Pipe: Maintain minimum cover requirements and conform to the general slope and grade of existing grade.
 - 1. No low spots or high spots will be allowed except at air valves and blowoff valves shown on the Drawings or instances where unknown utility locations require variations from the slopes of the existing grade.
- E. Cut trenches to width indicated on Drawings. Remove water or materials that interfere with Work.
- F. Length of Open Trench:
 - 1. Trench is considered open unless compacted backfill and/or temporary pavement is brought to a level flush with the existing grade, or the trench is covered with traffic-rated steel trench plates.
 - 2. Location: At all locations as shown on Drawings.
 - a. Maximum: That in which the pipeline can be installed, and the trench backfilled and compacted in the same day.
 - b. Install pipeline, complete with backfill and temporary pavement, across one traffic lane at a time.
 - c. Maintain one-way traffic during daylight hours and two-way traffic during hours of darkness.
 - d. At the end of each working day, clean up all operations performed by Contractor in such a manner that full traffic lanes and conditions are resumed, including complete backfill and temporary paving.
 - e. Open trench is allowed only where a full roadway width of 24 feet can be maintained and when traffic is properly protected from the trench with barricades, signs, and flashers.

3. All other locations:
 - a. Maximum at end of working day: 200 feet.
 4. Protect open trench to prevent danger to Owner and public at all times.
- G. Perform excavation within 24 inches of existing utility service in accordance with utility's requirements.
- H. Obstructions within the trench area or adjacent thereto such as dead tree roots, stumps, structures, logs, rubbish, and debris of all types shall be removed without additional compensation from the Owner. The Engineer may, if requested, make changes in the trench alignment to avoid major obstructions if such alignment changes can be made within the easement and right-of-way without adversely affecting the intended function of the facility.
- I. Directional Boring will not be allowed, except for copper service pipes, because a suitable bedding material is required around PVC water pipe. Copper service pipes installed by any boring method shall be provided with a continuous Schedule 40 PVC sleeve or casing.
- J. Over Excavation:
1. Any part of the trench carried below the proper grade by an act or failure to act on the part of the Contractor shall be corrected with compacted bedding material at the Contractor's expense.
 2. Where it becomes necessary to remove boulders or other interfering objects at subgrade for bedding, any void below such subgrade shall be filled with compacted bedding material.
- K. Dewatering:
1. Contractor shall control water entering the excavation such that it does not interfere with bedding, backfill, and pipe placement.
 2. Comply with authorities having jurisdiction for water discharge and disposal from pumping operations.
 3. Prevent damage to adjacent properties, buildings, structures, utilities, and other facilities from dewatering operations.
 - a. Repair damage caused by dewatering operations at no additional cost to the Owner.
 4. Prevent loss of fines, quick condition, or softening of foundation subgrade.
 5. Maintain stability of sides and bottoms of excavations and trenches.
 6. Pump water into drainage channels, according to requirements of authorities having jurisdiction.
 7. Remove dewatering equipment after dewatering operations are discontinued.
- L. Unsuitable Material:
1. If soft, spongy, unstable, or other similar material is encountered upon which the bedding material or pipe is to be placed, this unsuitable material shall be removed to a depth ordered by the Engineer and replaced with trench stabilization material suitably densified.

2. The Engineer may also require an envelope of an acceptable filter fabric be installed around the stabilization material if it appears migration of adjacent materials into the stabilization material could be a problem.
3. Addition of trench stabilization material so ordered will be paid for per SS 7-4 PAYMENT FOR EXTRA WORK.
 - a. The Contractor shall bear any additional expense for trench excavation, shoring, or dewatering.
 - b. If the necessity for such trench stabilization material has been caused by an act or failure to act on the part of the Contractor, the Contractor shall bear the entire expense of the additional material.

M. Material Disposal:

1. Refer to the Standard General Conditions and Supplementary Conditions.
2. All excavated material from Class "A" trenches and any excess material from Class "C" trenches shall be removed from the project site.
3. The Contractor shall make all arrangements for disposal of the material at off-site locations and shall, upon request, file with the Engineer the written consent of the Owner of the property upon which he intends to dispose of such material.
4. The Contractor shall comply with Trinity County Grading Ordinance No. 1347 for the disposal of excavated material.
5. The Contractor shall bear all costs of disposing of trees, stumps, brush, roots, limbs, and other waste materials from the clearing operation.
6. Material shall be disposed of in such a manner as to meet all requirements of State, County, and local regulations regarding health, safety, and public welfare.
7. In no case shall any material be left on the project, shoved onto abutting private properties, or be buried in embankments or trenches on the project.
8. No burning will be permitted.
 - a. On easements through private property, the Contractor shall not burn on the site unless specifically permitted in writing by the Owner of the property, in addition to complying with all State, County, and local regulations regarding burning.

3.5 TRENCH CUTOFFS

- A. Install on pipelines with slopes greater than three percent under pavement to prevent water migration and hydrostatic pressures on pavement caused by water in permeable backfill.
- B. Interval: At every four feet of vertical drop in elevation along the surface grade of the trench. For example, if the grade is five percent in 400 feet, there would be five trench cutoffs required in the trench along the route.
- C. Description:
 1. For use in Class "C" backfill.
 2. Material: Bentonite/Soil mixture consisting of eight percent (by weight) powdered bentonite mixed with native soil per the bentonite manufacturer's recommendations.
 3. Minimum Compaction: 90 percent relative compaction.

3.6 CONCRETE THRUST BLOCKS

- A. Required on all underground piping where the use of unrestrained rubber ring joints allows a hydraulic thrust to occur at a fitting.
- B. As shown on the Drawings.
 - 1. Pour neat against firm undisturbed material.

3.7 BEDDING

- A. Where it becomes necessary to remove boulders or other interfering objects at subgrade for bedding, any void below such subgrade shall be filled with compacted bedding material.
- B. Pre-Installation of Pipe:
 - 1. Place to a minimum depth of 4 inches.
 - 2. Level and compact with a vibratory plate compactor to provide a firm base for the pipe.
 - 3. Bell holes shall be dug to allow the pipe to be supported by the bottom of the pipe barrel over its full length.
 - 4. Install location wire as shown on the Drawings.
- C. Post-Installation of Pipe:
 - 1. Place to spring line of pipe and densify by hand tamping with an acceptable T-bar tool.
 - 2. Particular care shall be taken to provide solid backing against the underside of the pipe.
 - 3. Place in 8-inch maximum lifts.
 - 4. The degree of compaction shall not be less than 90 percent of the laboratory maximum density.
 - 5. A vibrating plate compactor shall be used at the top of the bedding material, 6 inches above the top of the pipe.
 - 6. Place in the manner described above, regardless of the class of backfill above the bedding material.
 - 7. Install pipe findertape in the trench as shown on the Drawings.

3.8 BACKFILLING

- A. Trench backfill above the pipe zone (including surface restoration) will be divided into the following classifications, limits, and details of which are shown on the Drawings.
 - 1. Class "A1" Backfill:
 - a. Use in graveled shoulder, alleys, under concrete, unpaved driveways, and at other locations as designated by the Engineer.
 - b. Use in all areas where backfill class is not designated on the Drawings or in the Specifications.

2. Class "C" Backfill:
 - a. Use in areas where vehicle traffic is not expected and at the locations designated by the Engineer.
- B. References to Class "A" backfill in general shall mean that the statement applies to all backfills with "A" in the designation.
- C. Complete in an orderly fashion; and, in general, immediately after the pipe has been properly bedded.
 1. Install sufficient backfill material to insulate the pipe from temperature changes.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
 1. When the moisture content of the material being compacted is below that required to achieve the specified density, add water to each layer by sprinkling.
 2. Manipulate material as necessary to ensure uniform distribution of moisture until the moisture content is satisfactory.
- E. Class "A" Backfill:
 1. Placement: Uniform layers not to exceed 8 inches in loose thickness.
 2. Compaction: 90 percent relative compaction except for the top 18 inches in paved areas shall be compacted to 95 percent relative compaction.
 3. Compaction Methods: Mechanical tamping, vibration, or other acceptable methods.
 4. Compaction Timeframe: Immediately following pipe backfill operations.
- F. Class "C" Backfill:
 1. Placement: Where shown on the Drawings.
 2. Compaction: No specific compaction requirements must be met, but the Contractor shall bear any expense for repair of settlement to trenches during the guarantee period.
 3. Compaction Methods: Jetting, inundation, or mechanical means.
 4. Compaction Timeframe: Immediately following pipe backfill operations.
- G. Backfill trenches to contours and elevations with unfrozen fill materials.
- H. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- I. Employ placement method that does not disturb or damage foundation perimeter drainage or utilities in trench.
- J. Undermining and/or damage to adjacent pavement:
 1. In the event that trenching in the unpaved area adjacent to a paved roadway results in undermining or damage to the adjacent pavement, remove the pavement to a point 6 inches beyond the edge of the undermined or damaged pavement and replace the pavement to its original width.
 2. Pavement shall be cut in neat straight lines and all patches shall be rectangular in shape.

3. Payment for pavement replacement type backfill will be made only when the plan view centerline of the pipe is within the limits of the existing pavement.

3.9 SLURRY MIX

- A. Use only when approved by Engineer.
- B. Placement: Trench backfill.
 1. When used as a pipe zone material, the slurry mix shall be placed to the springline of the pipe and immediately compacted around and under the pipe with a T-bar or concrete vibrator.
 2. When used as trench backfill, the slurry mix can be placed as soon as the pipe zone material allows without causing the pipe to float.
 3. Maximum Height of Lift: Three times the trench width.
- C. Compaction:
 1. Timeframe: As soon as the lift height has been achieved.
 2. Methods: Vibratory plate compactor, concrete vibrator, or jumping jack trench compactor at the Contractor's option.
- D. Provide suitable measures to prohibit the pipe from floating.

3.10 CONCRETE ENCASEMENT OR CONCRETE CAP

- A. Install where shown on the Drawings.

3.11 DRAINAGE CHANNELS AND CULVERTS

- A. Replace in kind drainage culverts and channels which are removed or damaged. If the culvert is damaged, dispose of it and furnish and install a new one of the same size and kind.
- B. Where erosion of the trench is caused by drainage ways, provide paving, riprap, or suitable approved repair materials to stabilize the surface of the trench.

3.12 DRESSING OF SHOULDERS AND ROADWAYS

- A. Blade shoulders and roadways, as directed by the Engineer, until it presents a neat and uniform appearance.
- B. Shoulders shall be graded to be flush with the adjacent pavement and re-compacted.
- C. Provide additional aggregate base material as necessary to maintain a gravel shoulder.
- D. Remove and grade material from all culverts and ditches obstructed by the construction operation and dispose of all debris therefrom.

3.13 SITE CLEANUP

- A. Upon completion of the Work, clean up and dispose of all waste material.
- B. Clean up Class "C" backfill areas by mounding the trench backfill as shown on the trench details to prevent surface water from traveling along the line of the ditch and to allow for some settlement. The entire Work area surface shall be graded and raked, if necessary, to make the appearance as close to the native condition as possible.

3.14 TOLERANCES

- A. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.15 FIELD QUALITY CONTROL

- A. Compaction:
 - 1. Laboratory Tests:
 - a. Performed By: Engineer at the Owner's expense, unless noted otherwise.
 - b. To Determine: Moisture-density relations and maximum dry density of the backfill material.
 - 1) If the Contractor elects to change backfill materials after the initial laboratory tests, the Contractor shall bear all laboratory costs for re-testing.
 - 2. Field Tests:
 - a. Performed By: Engineer or Owner's Representative, at Owner's expense, unless noted otherwise.
 - b. Method: ASTM D6938.
 - 1) Relative compaction is the ratio of the field dry density to the laboratory maximum dry density expressed as a percentage.
 - c. Locations: Selected by the Engineer.
 - 1) Engineer or Owner's Representative will notify the Contractor of test locations in advance of backfill or prior to there being more than 4 feet of mechanically compacted backfill over the test locations and before application of paving.
 - 2) Engineer or Owner's Representative shall perform the required tests not more than 24 hours after test locations have been selected to avoid the delay of the Contractor's work.

- d. The Contractor shall make provision for any excavation or shoring needed to expose the depth of the top of a compaction test and allow the Engineer access to the test location.
3. Rejected Work:
 - a. Where tests indicate the compaction is unsatisfactory, the Engineer may reject the Work up to half the way to the next acceptable test.
 - 1) The Contractor may, at his expense, order additional tests by the Engineer if he feels such tests do not adequately define the Work.
 - b. The Engineer may order additional compaction tests at any location where Work has been found not to be in conformance with the Specifications.
 - c. Rejected Work shall be corrected by the Contractor and may be retested if so ordered by the Engineer.
 - 1) If such Work is found to be in accordance with the Contract Documents, the Owner shall pay the cost of the retest.
 - 2) If such Work is not found to be in accordance with the Contract Documents, the Contractor shall pay such cost.
 - B. Perform laboratory material tests in accordance with [ASTM D1557.] [ASTM D698.] [AASHTO T180.]

3.16 PROTECTION OF FINISHED WORK

- A. Reshape and re-compact fills subjected to vehicular traffic during construction.

3.17 CONTRACTOR'S RESPONSIBILITY

- A. Settlement of replaced pavement over trenches within the warranty period shall be considered a result of improper or inadequate compaction of the backfill or base materials.
- B. Promptly repair all pavement deficiencies noted during the warranty period at no additional cost to the Owner.
- C. Promptly repair any settlement problems in other trench backfill areas during the warranty period at no additional cost to the Owner.
- D. Responsible for erosion of the trench during the warranty period.

END OF SECTION 312316.13

SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fence framework, fabric, and accessories.
2. Excavation for post footings.
3. Concrete foundation for posts and center drop for gates.
4. Manual gates and related hardware.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. ASTM International:

1. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire.
2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
4. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
5. ASTM A491 - Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric.
6. ASTM A817 - Standard Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric and Marcellled Tension Wire.
7. A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
8. ASTM B429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
9. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
10. ASTM F552 - Standard Terminology relating to Chain Link Fencing.
11. ASTM F567 - Standard Practice for Installation of Chain-Link Fence.
12. ASTM F626 - Standard Specification for Fence Fittings.
13. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric.
14. ASTM F900 - Standard Specification for Industrial and Commercial Swing Gates.

15. ASTM F934 - Standard Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials.
16. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
17. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
18. ASTM F1183 - Standard Specification for Aluminum Alloy Chain Link Fence Fabric.
19. ASTM F1184 - Standard Specification for Industrial and Commercial Horizontal Slide Gates.
20. ASTM F1345 - Standard Specification for Zinc - 5% Aluminum-Mischmetal Alloy-Coated Steel Chain-Link Fence Fabric.

C. Chain Link Fence Manufacturers Institute:

1. CLFMI - Product Manual.

D. The "Greenbook" Standard Specifications for Public Works Construction (SS), 2018 Edition.

1. Standard specifications for Public Works SS 206-6.
2. Standard specifications for Public Works SS 304-3.

1.4 SYSTEM DESCRIPTION

- A. Fence Height: 6 feet nominal.
- B. Line Post Spacing: At intervals not exceeding 10 feet.
- C. Fence Post and Rail Strength: Conform to ASTM F1083 Light Industrial Fence quality.

1.5 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
- D. Product Data: Submit data on fabric, posts, accessories, fittings and hardware.

1.6 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.

1.7 QUALITY ASSURANCE

- A. Perform installation according to ASTM F567.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum five years documented experience.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.
- C. Identify each package with manufacturer's name.
- D. Store fence fabric and accessories in secure and dry place.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

A. Chain Link Fence:

1. Chain link fence materials shall conform to SS. 206-6.
2. Fabric shall be 6 feet high and have twist finish on the bottom selvage and a knuckle finish on the top selvage and be galvanized after fabrication per ASTM A392 Class 1.
3. Top rail and bottom tension wire shall be provided on all fencing.
4. Provide stops and latches on all gates.
5. Drop rods shall be supplied on all double swing gates; steel pipe center gate stops encased in a 12-inch by 12-inch concrete footing shall be provided for all drop rod latches.
6. All gates shall be provided with industrial grade, hot dipped galvanized malleable iron, 180-degree hinges without the use of 180-degree adapters.
7. Posts shall be Class 1 galvanized steel pipe as defined in SS 206-6.1 with the following nominal pipe sizes (NPS):

Line Posts:	2 NPS (2.375 OD)
End and Corner Posts:	2-1/2 NPS (2.625 OD)
Gate Post for Single Gate Less Than 6 Feet:	2-1/2 NPS (2.625 OD)
Gate Post for Single Gate Over 6 Feet:	3-1/2 NPS (4.0 OD)
Top Rails and Braces:	1-1/4 NPS (1.660 OD)
Gate Frames:	1-1/2 NPS (1.9 OD)
Gate Stiffeners:	1-1/4 NPS (1.660 OD)

2.2 ACCESSORIES

- A. Caps: Sized to post diameter, set screw retainer.

- B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners, and fittings; galvanized steel.
- C. Gate Hardware: Center gate stop and drop rod.

2.3 GATES

A. General:

1. Gate Types, Opening Widths and Directions of Operation: As indicated on Drawings.
2. Factory-assembled gates.
3. Design gates for operation by one person.

B. Swing Gates:

1. Fabricate gates to permit 180 degree swing.
2. Gates Construction: ASTM F900 with welded corners. Use of corner fittings is not permitted.

2.4 FINISHES

- A. Components and Fabric: Galvanized to ASTM A123 for components; ASTM A153 for hardware; ASTM A392 for fabric; 2.0 oz/sq ft coating.
- B. Hardware: Galvanized to ASTM A153, 2.0 oz/sq ft coating.
- C. Accessories: Same finish as framing.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install framework, fabric, accessories and gates according to ASTM F567 and SS 304-3.
- B. Set all fence and gate posts plumb, in concrete footings with top of footing 1 inch above finish grade. Slope top of concrete for water runoff.
- C. Line Post Footing Depth Below Finish Grade: 36 inches.
- D. Corner, Gate, and Terminal Post Footing Depth Below Finish Grade: 36 inches.
- E. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.
- F. Install top rail through line post tops and splice with 6-inch-long rail sleeves.
- G. Install center and bottom brace rail on corner gate leaves.
- H. Place fabric on outside of posts and rails.

- I. Do not stretch fabric until concrete foundation has cured 7 days.
- J. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
- K. Position bottom of fabric 2 inches above finished grade.
- L. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- M. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
- N. Install bottom tension wire stretched taut between terminal posts.
- O. Support gates from gate posts. Do not attach hinged side of gate from building wall.
- P. Install gate with fabric to match fence. Install three hinges on each gate leaf, latch, catches, and drop bolt.
- Q. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.
- R. Install posts with 6 inches maximum clear opening from end posts to buildings, fences, and other structures.
- S. Excavate holes for posts to diameter and spacing indicated on Drawings without disturbing underlying materials.

3.2 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch.
- B. Maximum Offset from Indicated Position: 1 inch.
- C. Minimum distance from property line: 6 inches.

END OF SECTION 323113

SECTION 330110.58 - DISINFECTION OF WATER UTILITY PIPING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Disinfection of potable water main and piping systems.
2. Testing and reporting of results.

B. Related Requirements:

1. Section 402319.01 – Process Piping.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Water Works Association:

1. AWWA B300 - Hypochlorites.
2. AWWA B302 - Ammonium Sulfate.
3. AWWA B303 - Sodium Chlorite.
4. AWWA C651 - Disinfecting Water Mains.
5. AWWA C655 - Field Dechlorination.

1.4 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Disinfection Procedure:

1. Submit description of procedure, including type of disinfectant and calculations indicating quantities of disinfectants required to produce specified chlorine concentration.

- C. Product Data: Submit manufacturer information for proposed chemicals and treatment doses.

- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

- E. Certify that final water complies with disinfectant quality standards of authority having jurisdiction.

- F. Test and Evaluation Reports: Indicate testing results comparative to specified requirements.
- G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Disinfection Report:
 - 1. Type and form of disinfectant used.
 - 2. Date and time of disinfectant injection start and completion.
 - 3. Test locations.
 - 4. Name of person collecting samples.
 - 5. Initial and 24-hour disinfectant residuals in treated water in ppm for each outlet tested.
 - 6. Date and time of flushing start and completion.
 - 7. Disinfectant residual after flushing in ppm for each outlet tested.

1.6 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Perform Work according to AWWA C651.

PART 2 - PRODUCTS

2.1 DISINFECTION CHEMICALS

- A. Chemicals:
 - 1. Hypochlorite: Comply with AWWA B300.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that piping system has been cleaned, inspected, and pressure tested.

- B. Verify that access fittings have been installed under Section 331413 - Public Water Utility Distribution Piping and Section 402319.01 – Process Piping.
- C. Perform scheduling and disinfecting activity with startup, water pressure testing, adjusting and balancing, and demonstration procedures, including coordination with related systems.

3.2 INSTALLATION

- A. Provide all required equipment, tools, fittings, thrust restraints, personnel, and appurtenances to perform Work of this Section.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Disinfection shall be conducted in accordance to AWWA C651 Section 4.4 - Continuous Feed Method.
 - 1. The continuous feed method consists of completely filling the main with potable water, removing air pockets, then flushing the completed main to remove particulates, and refilling the main with potable water that has been chlorinated to 25 mg/L. After a 24-hr holding period in the main, there shall be a free chlorine residual of not less than 10 mg/L.
 - 2. Before the main is chlorinated, it shall be filled with potable water to eliminate air pockets and flushed to remove particulates. The flushing velocity in the main shall not be less than 3.0 ft/sec.
 - 3. For 24-inch or larger diameter mains, an acceptable alternative to flushing is to broom-sweep the main, carefully removing sweepings prior to filling and chlorinating the main. OSHA requirements for confined space need to be addressed before entering a pipeline.
 - 4. Potable water may be supplied from a temporary backflow-protected connection to the existing distribution system or other supply source approved by the Engineer. The cross-connection control device shall be consistent with the degree of hazard for backflow protection of the active distribution system. The flow shall be at a constant, measured rate into the newly installed water main.
 - 5. At a point not more than 10 feet downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 25 mg/L free chlorine. To ensure that an appropriate concentration is achieved, the free chlorine concentration shall be measured at regular time intervals in accordance with the procedures described in *Standard Methods for the Examination of Water and Wastewater* or AWWA Manual M12 or using appropriate chlorine test kit.
 - 6. Chlorine application shall not cease until the entire main is filled with chlorinated water. The chlorinated water shall be retained in the main for at least 24 hours, during which time valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances. At the end of this 24-hour period, the treated water in all portions of the main shall have a residual of not less than 10 mg/L of free chlorine.
 - 7. Disinfection agent shall consist of a sodium hypochlorite or calcium hypochlorite solution. Liquid chlorine (gas) is not permitted.

8. Hypochlorite solutions may be applied to the water main with a chemical-feed pump designed for feeding chlorine solutions. Feed lines shall be made of material capable of withstanding the corrosion caused by the concentrated chlorine solutions and the maximum pressures that may be created by the pumps. All connections shall be checked for tightness before the solution is applied to the main.
- D. The Contractor may elect to use the Tablet/Granule Method of chlorination per AWWA C651 Section 4.3.
1. Tablet/Granule Method will only be permitted if the pipe is kept clean and dry during construction.
 2. The Tablet Method must not be used on solvent-welded plastic or on screwed-joint steel pipe because of the danger of fire or explosion from the reaction of the joint compounds with the calcium hypochlorite.
 3. The Tablet Method consists of placing calcium hypochlorite granules or tablets in the water main during installation and then filling the main with potable water to create a chlorine solution.
 4. Calcium hypochlorite granules shall be placed at the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500-foot intervals. Also, at least one tablet shall be placed in each hydrant branch and in other appurtenances.
 5. The minimum number of 5-g tablets required for each pipe section shall be $0.0012 d^2L$ rounded to the next higher integer, where d is the inside pipe diameter, in inches, and L is the length of the pipe section, in feet (based on 3.25-g available chlorine per tablet).
 6. Calcium hypochlorite tablets shall be attached by an adhesive meeting the requirements of NSF/ANSI 61. There shall be adhesive only on the broadside of the tablet attached to the surface of the pipe. Attach tablets inside and at the top of the main. If the tablets are attached before the pipe section is placed in the trench, their positions shall be marked on the pipe exterior to indicate that the pipe has been installed with the tablets at the top.
 7. Potable water may be supplied from a temporary backflow-protected connection to the existing distribution system or other supply source approved by the Engineer. The cross-connection control device shall be consistent with the degree of hazard for backflow protection of the active distribution system. The flow shall be at a constant, measured rate into the newly installed water main.
 8. When installation has been completed, the main shall be filled with potable water such that the full pipe velocity is no greater than 1 ft/sec. Fill rate must be carefully controlled to ensure tablets do not come loose from pipe. Precautions shall be taken to ensure that air pockets are eliminated.
 9. The chlorinated water shall remain in the pipe for at least 24 hours. If the water temperature is less than 41°F, the water shall remain in the pipe for at least 48 hours. A detectable free chlorine residual (≥ 0.2 mg/L) shall be found at each sampling point after the 24- or 48-hour period.
- E. After chlorination, the water shall remain in the pipeline or be diluted until the chlorine residual has dropped to below two parts per million before it is flushed from the extremities of the system. Furthermore, it may be necessary to land apply the chlorinated water or otherwise dechlorinate the water in order to discharge it to any storm drain, drainage channel, or surface water where damage could occur to fish or other aquatic life or in violation of any governmental laws or regulations. Refer to AWWA C655 Field Dechlorination for dechlorination procedures if required.

- F. All of the pipeline shall then be flushed and remain full with a bacteriologically acceptable water supply.
- G. Before the new main is connected to the distribution system acceptable bacteriological test shall be received.
 - 1. The Contractor shall provide a sanitary means and all access fittings as required for sample collection.
 - 2. Samples for biological testing will be collected by the Owner. Biological laboratory tests will be paid for by the Owner.
 - 3. After disinfection and the required chlorine residuals have been confirmed, the main shall sit for 16 hours minimum without any water use. Then, without flushing, the Owner will collect two sets of acceptable samples taken at least 15 minutes apart.
 - 4. A minimum of four test samples for coliform bacteria shall be taken by the Engineer from selected points in the pipeline. At least one set of samples taken every 1200 feet, if trench water has entered the pipe during construction, samples will be collected at 200-foot intervals at no cost to the Owner.
 - 5. If the biological tests indicate contamination, the pipeline shall be disinfected again until no contamination exists, all at no extra cost to the Owner.
- H. At connections to the existing system where some sections of piping cannot be reasonably disinfected in the normal procedure, all new pipe, fittings, etc. shall be sprayed or swabbed inside and out with a strong (one to five percent) chlorine solution prior to installation and installed in a sanitary manner so as not to contaminate the system. If the Contractor fails to take the proper precautions during connections to existing systems and allows dirt or dirty water to enter the existing piping, he shall flush and disinfect the existing water system as required by the Engineer.
- I. Replace permanent system devices that were removed for disinfection.

3.3 FIELD QUALITY CONTROL

- A. Disinfection, Flushing, and Sampling:
 - 1. Disinfect pipeline installation according to AWWA C651.
 - 2. Use of liquid chlorine (gas) is not permitted.
 - 3. Upon completion of retention period required for disinfection, flush pipeline until chlorine concentration in water leaving pipeline is no higher than that generally prevailing in existing system or is acceptable for domestic use.
 - 4. Disposal:
 - a. Legally dispose of chlorinated water.
 - a. Chlorinated discharge must have a neutralizing chemical applied to neutralize chlorine residual remaining in water.
 - 5. After final flushing and before pipeline is connected to existing system or placed in service, certify that disinfectant level meets quality standards of authority having jurisdiction.

END OF SECTION 330110.58

SECTION 330550 - ENCLOSURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Backflow device enclosures.
2. Anchors.

B. Related Requirements:

1. Section 033000 - Cast-In-Place Concrete: Execution requirements for embedded anchors and attachments for metal fabrications specified by this Section in concrete.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American National Standards Institute:

1. ANSI A14.3 - American National Standard (ASC) for Ladders - Fixed - Safety Requirements.

C. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.
3. AWS D1.6 - Structural Welding Code - Stainless Steel.

D. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
4. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
5. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
6. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.

7. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
 8. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
- E. The “Greenbook” Standard Specifications for Public Works Construction (SS), 2018 Edition.
1. SS 201 - Concrete, Mortar, and Related Materials.
- F. SSPC: The Society for Protective Coatings:
1. SSPC - Steel Structures Painting Manual.
 2. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
 3. SSPC Paint 20 - Zinc-Rich Coating (Type I - Inorganic and Type II - Organic).
 4. SSPC SP 1 - Solvent Cleaning.
 5. SSPC SP 10 - Near-White Blast Cleaning.

1.4 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept metal fabrications on-Site in labeled shipments. Inspect for damage.
- C. Protect metal fabrications from damage by exposure to weather or by ground contact.

1.6 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 BACKFLOW DEVICE ENCLOSURES

- A. Manufacturers:
 1. Placer Waterworks, Model E1A.
 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.

3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Type: Insulated hinged door and cover to allow for 100% access for servicing.
2. Dimensions:
 - a. Width: 17.
 - b. Length: 40.
 - c. Height: 30.
3. Insulation: 1-inch Styrofoam insulation bonded to 22-gauge galvanized sheet steel.
4. Door Frame Material: 1³/₄-inch x 1³/₄-inch x 3/₁₆-inch angle iron.
5. Base Frame Material: 2-inch x 2-inch x 1/₈-inch angle iron.
6. Expanded Metal Screen: No. 9 by 1¹/₂-inch, welded every 6 inches.
7. Anchor Feet: Internal, 3-inch x 5-inch x 3/₈-inch steel plate with 5/₈-inch diameter hole.
8. Hinges: Internal, stainless steel.
9. Lock Mechanism: Recessed stainless steel lock hasp with guard.
10. All welding shall be done by the manufacturer per AWS specifications prior to coating.

C. Coating:

1. All parts to be media blasted to SSPC-5 white metal blast with 3-4 mils anchor pattern.
2. Prime Coat: Zinc rich epoxy powder coat, 4-5 mils dry film thickness (DFT).
3. Top Coat: Polyester polyurethane powder coat, 8-10 mils DFT.
4. Color: Hunter Green.

2.2 ANCHORS

A. Description:

1. ASTM A307; Grade A.
2. Shape: Hooked.
3. Furnish with nut and washer.
4. Finish: None.

B. Epoxy Adhesive Anchors:

1. Manufacturers:
 - a. Hilti HY-200.
 - b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Threaded Rod: Type 316 stainless steel, size per Drawings.
3. Nut: Type 316 stainless steel.

C. Mechanical Expansion Anchors:

1. Manufacturer:
 - a. Hilti Kwik Bolt TZ (KB-TZ).
 - b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Material: Type 316 stainless steel.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive Work.

3.2 INSTALLATION

- A. Install all enclosures and appurtenances per the manufacturer's recommendations.
- B. Install items plumb and level, accurately fitted, and free from distortion or defects.
- C. Make provisions for erection stresses. Install temporary bracing to maintain alignment until permanent bracing and attachments are installed.
- D. Perform field welding according to AWS D1.1.
- E. Obtain approval of Engineer prior to Site cutting or making adjustments not scheduled.
- F. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.3 FIELD QUALITY CONTROL

- A. Welding: Inspect welds according to AWS D1.1.
- B. Replace damaged or improperly functioning hardware.
- C. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.
- D. Touch up factory-applied finishes according to manufacturer-recommended procedures.

3.4 ADJUSTING

- A. Adjust operating hardware and lubricate as necessary for smooth operation.

END OF SECTION 330550

SECTION 330561 - CONCRETE MANHOLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete and masonry manholes.
2. Utility structures.
3. Frames and covers.
4. Riser rings.

B. Related Requirements:

1. Section 031000 - Concrete Forming and Accessories: Erection and bracing of forms.
2. Section 032000 - Concrete Reinforcing: Reinforcing steel as required by this Section.
3. Section 033000 - Cast-in-Place Concrete: Concrete type for manhole and structure foundation slab construction.
4. Section 040513 - Masonry Mortaring: Mortar.
5. Section 040516 - Masonry Grouting: Grout.
6. Section 312316.13 - Trenching

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Association of State Highway Transportation Officials:

1. AASHTO M306 - Standard Specification for Drainage, Sewer, Utility, and Related Castings.

C. American Concrete Institute:

1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.

D. ASTM International:

1. ASTM A48 - Standard Specification for Gray Iron Castings.
2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM C55 - Standard Specification for Concrete Building Brick.
4. ASTM C361 - Standard Specification for Reinforced Concrete Low-Head Pressure Pipe.

5. ASTM C443 - Standard Specification for Precast Manhole Sections.
6. ASTM C478 - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections.
7. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
8. ASTM C877 - Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections.
9. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.
10. ASTM C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
11. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
12. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
13. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

E. The “Greenbook” Standard Specifications for Public Works Projects (SS), 2018 Edition.

1.4 COORDINATION

A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 SUBMITTALS

A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Certifications as required to comply with American Iron and Steel (AIS) provisions.

C. Product Data: Submit manufacturer information for manhole covers, component construction, features, configuration, and dimensions.

D. Shop Drawings:

1. Indicate structure locations and elevations.
2. Indicate sizes and elevations of piping and penetrations.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

G. Qualifications Statement:

1. Submit qualifications for manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Refer to Standard General Conditions – Record Documents.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Handling: Comply with precast concrete manufacturer instructions and ASTM C913 for unloading and moving precast manholes and drainage structures.
- D. Storage:
 - 1. Store materials according to manufacturer instructions.
 - 2. Store precast concrete manholes and drainage structures to prevent damage to Owner's property or other public or private property.
 - 3. Repair property damaged from materials storage.
- E. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.9 AMBIENT CONDITIONS

- A. Maintain materials and surrounding air temperature to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry Work.

1.10 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.11 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 CONCRETE AND MASONRY MANHOLES

A. Precast:

1. Manufacturers:

- a. Cook Concrete Products.
- b. Teichert Aggregate.
- c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
- d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2. Base: None

3. Manhole Sections:

a. Materials:

- 1) Reinforced Precast Concrete: Comply with ASTM C478.
- 2) Gaskets: Comply with ASTM C923.

b. Joints:

- 1) Comply with ASTM C913.

c. Shaft and Concentric Cone Top Sections:

- 1) Pipe Sections: Reinforced precast concrete.
- 2) Joints:
 - a) Lipped male/female - tongue and groove.
- 3) Sleeved to receive pipe sections.

2.2 RISER RINGS

A. Manufacturers:

1. Cooks Concrete.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Thickness of 2 to 6 Inches:

- a. Precast concrete.
- b. Comply with ASTM C478.

2.3 ACCESSORIES

A. Drain Rock:

1. Description:

- a. Clean, imported gravel, free from clay balls and organic matter.
- b. Size: $\frac{3}{4}$ inch.

B. Grout: As specified in Section 033000 - Cast-in-Place Concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that items provided by other Sections of Work are properly sized and located.
- B. Verify that built-in items are in proper location and are ready for roughing into Work.
- C. Verify that excavation base is ready to receive Work and excavations and that dimensions and elevations are as indicated on Drawings.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with the Contract Documents, request clarification from Engineer before proceeding.
- B. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers as indicated on Drawings to indicate its intended use.
- C. Coordinate placement of inlet and outlet pipe or duct sleeves as required by other Sections.
- D. Do not install manholes and structures where Site conditions induce loads exceeding structural capacity of manholes or structures.
- E. Inspect precast concrete manholes and structures immediately prior to placement in excavation to verify that they are internally clean and free from damage; remove and replace damaged units.

3.3 INSTALLATION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface structures or utilities in immediate or adjacent areas.

- C. Correct over-excavation with coarse aggregate.
- D. Remove large stones or other hard matter impeding consistent backfilling or compaction.
- E. Protect manhole from damage or displacement while backfilling operation is in progress.
- F. Excavating:
 - 1. As specified in Section 312316.13 – Trenching and indicated locations and depths.
 - 2. Provide clearance around sidewalls of manhole or structure for construction operations, granular backfill, and placement of geotextile filter fabric.
 - 3. If ground water is encountered, prevent accumulation of water in excavations; place manhole or structure in dry trench.
 - 4. Where possibility exists of watertight manhole or structure becoming buoyant in flooded excavation, anchor manhole or structure to avoid flotation as approved by Engineer.
- G. Backfilling: As specified in Section 312316.13 - Trenching.
- H. Precast Concrete Manholes:
 - 1. Lift precast components at lifting points designated by manufacturer.
 - 2. When lowering manholes into excavations and joining pipe to units, take precautions to ensure that interior of pipeline and structure remains clean.
- I. Cast-in-Place Concrete Manholes
 - 1. Bear firmly and fully on compacted crushed stone bedding.
 - 2. Erect and brace forms against movement as specified in Section 031000 - Concrete Forming and Accessories.
 - 3. Install reinforcing steel as indicated on Drawings and as specified in Section 032000 - Concrete Reinforcing.
 - 4. Place and cure concrete as specified in Section 033000 - Cast-in-Place Concrete.
- J. Manhole Assembly:
 - 1. Remove foreign materials from joint surfaces.
 - a. Install rubber gasket joint sealant between all precast sections per manufacturer's recommendations.
 - 2. Maintain alignment between sections.
 - 3. Two 1¼-inch sealant ropes shall be placed as follows:
 - a. 1 to 1½ inches from interior manhole surface.
 - b. On horizontal portion of the outer joint about 1 to 1½ inches from outside manhole surface.
 - 4. Top joint between frame and first grade ring shall be set with mortar for adjustment of the final cover elevation.
 - a. No mortar joint shall be more than 1 inch thick.

5. 1-inch sealant rope shall be placed between each grade ring.

K. Frames and Covers:

1. Set frame and cover using a maximum of three grade rings not to exceed 12 inches in total height.
2. Set frame and cover to finished ground as detailed on the Drawings.

L. Completion of Manhole:

1. All lifting holes in wall or base shall be grouted full.
2. All steel lifting loops shall be cut off and coated with coal tar epoxy.
3. Grade rings shall be coated smoothly with mortar.

END OF SECTION 330561

SECTION 331413 - PUBLIC WATER UTILITY DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Polyvinyl Chloride (PVC) Pipe and Fittings, 3-Inch and Smaller.
2. Flanged Coupling Adapters (FCA) and Flexible Couplings (FC).
3. Pipe Tape Wrap.
4. Pipe Finder Tape.
5. Location Wire.

B. Related Requirements:

1. Section 330110.58 - Disinfection of Water Utility Piping Systems: Disinfection of water mains and appurtenances.
2. Section 331419 - Valves and Hydrants for Water Utility Service: Fire hydrants, valves, and valve boxes for fire hydrant and water main installations.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Association of State Highway and Transportation Officials:

1. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

C. American Society of Mechanical Engineers:

1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
2. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard.
3. ASME B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300.

D. ASTM International:

1. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)).
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).

3. ASTM D1785 - Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
4. ASTM D2241 - Standard Specification for Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series).
5. ASTM D2683 - Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
6. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
7. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
8. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
9. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

E. American Water Works Association:

1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
6. AWWA C153 - Ductile-Iron Compact Fittings.
7. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
8. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.
9. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.
10. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In., for Water Transmission and Distribution.
11. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. Through 3 In., for Water Service.

F. NSF International:

1. NSF 60 - Drinking Water Treatment Chemicals - Health Effects.
2. NSF 61 - Drinking Water System Components - Health Effects.
3. NSF 372 - Drinking Water System Components - Lead Content.

G. Plastic Pipe Institute.

H. City of Redding (COR) Construction Standards.

I. The "Greenbook" Standard Specifications for Public Works Construction (SS), 2018 Edition.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.6 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Product Data: Submit manufacturer information regarding pipe materials, pipe fittings, and valves.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. Preconstruction Photographs: Submit digital files of color photographs of Work areas and material storage areas.
- G. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and installer.

1.7 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and burial depth.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.8 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.

- D. Perform Work according to AWWA standards.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum five years' documented experience in installation of liner materials.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Storage:
 - 1. Store materials according to manufacturer instructions.
 - 2. Block individual and stockpiled pipe lengths to prevent moving.
 - 3. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.
 - 4. Store PE and PVC materials out of sunlight.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.11 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.12 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS, 3-INCH AND SMALLER

- A. Comply with ASTM D1785.

- B. Location: Distribution System.
- C. Schedule: 40.
- D. Fittings: Schedule 40 conforming to ASTM D2466.
- E. Joints:
 - 1. Type: Solvent weld.
 - a. Includes primer and concrete.
 - b. Certified by NSF for use with potable water.
 - c. Compatible with the material being conveyed by the piping system.

2.2 FLANGED COUPLING ADAPTERS (FCA) AND FLEXIBLE COUPLINGS (FC)

- A. Manufacturers:
 - 1. Romac Industries.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Comply with AWWA C219.
 - 2. NSF 61 Certified.
 - 3. Material:
 - a. 12-inch and Smaller: Ductile iron.
 - 4. Coatings and Linings:
 - a. Fusion bonded epoxy per AWWA C213, NSF 61 Certified.
 - 5. Fasteners:
 - a. High-strength low alloy steel with heavy hex nuts.
 - 6. Thrust Restraint: Suitable for piping test pressure.

2.3 MATERIALS

- A. Bedding and Backfill: As specified in Section 312316.13 - Trenching.

2.4 ACCESSORIES

- A. Pipe Tape Wrap:
 - 1. Manufacturers:
 - a. Polyken 930 by the Polyken Division of the Kendall Company, Chicago, IL.
 - b. Tapecoat Company, Inc., Evanston, IL.

- c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
 2. Description:
 - a. Type: Conformable polyethylene-backed butyl tape.
 - b. Thickness: 35 mils.
 - c. The surface preparation, type of primer and application, and application of tape, including the amount of lap, shall be in accordance with the recommendations of the coating manufacturer.
- B. Pipe Finder Tape:
 1. Manufacturers:
 - a. Christy's.
 - b. PRESCO.
 - c. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - d. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
 2. Description:
 - a. Type: Detectable Mylar encased aluminum foil.
 - b. Wording: "CAUTION: BURIED WATERLINE BELOW."
 - c. Color: Blue.
 - d. Width: 2 inches.
 - e. Printing shall be under the mylar (reverse printed) so as to be readable through the clear mylar.
 - f. Surface printing on the tape is not acceptable.
- C. Location Wire:
 1. Description:
 - a. Pipe Installation: Open-cut.
 - b. Type: 10 AWG solid copper conductor.
 - c. Insulation: 30-mil thick high-density polyethylene (HDPE).
 - d. Insulation Rating: 30 volts.
 - e. Insulation Color: Shall meet the APWA color code standard for identification of buried utilities.
- D. Location Wire Connector:
 1. Manufacturers:
 - a. Pro-Trace TW Connector.
 - b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2. Description:
 - a. Type: Silicone filled, manufactured from impact-resistant polycarbonate.
 - b. Rating: Direct burial use in damp, wet, and submersible locations.
 - c. Connector shall be designed to work with copper and copper-clad location wire.
 - d. Splices required for lateral runs shall be done without cutting the main location wire.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before installation, each article shall be inspected, and any damaged material discarded. Any damaged coating shall be repaired.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Preconstruction Site Photos:
 1. Take photographs along centerline of proposed pipe trench; minimum one photograph for each 50 feet of pipe trench.
 2. Show mailboxes, curbing, lawns, driveways, signs, culverts, and other existing Site features.
 3. Include Project description, date taken, and sequential number on back of each photograph.
- C. Pipe Cutting:
 1. The Contractor shall perform all work of cutting pipe and fittings or special castings necessary to the proper and accurate assembly, erection, and completion of the work. All pipe shall be cut to fit accurately without damaging the pipe or lining and so as to leave a smooth end at right angles to the axis of the pipe.
 2. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
 3. Use only equipment specifically designed for pipe cutting; use of chisels or hand saws is not permitted.
 4. Grind edges smooth with beveled end for push-on connections.
- D. Remove scale, dirt, and debris on inside and outside before assembly.
- E. Prepare pipe connections to equipment with flanges or unions.
- F. Pipe Threads: Pipe ends shall be reamed to the full bore of the pipe. Threads shall conform to ASNI B1.20.1. In making up threaded joints, an accepted thread lubricant shall be applied to the male threads only.

3.3 INSTALLATION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. Excavation: As specified in Section 312316.13 - Trenching.
- C. Bedding: As specified in Section 312316.13 - Trenching.
- D. Pipe and Fittings:
 - 1. Ductile iron pipe, fittings, and appurtenances shall be installed in accordance with AWWA C600 and the manufacturer's installation instructions.
 - 2. PVC pipe shall be assembled in accordance with AWWA C605 and the manufacturer's installation instructions.
 - 3. PVC Pipe 3-inch and Smaller:
 - a. Wipe off all joints and surfaces with clean, dry rag.
 - b. Apply primer to both the pipe and fitting, working the primer into the surface to soften the PVC pipe.
 - c. While the primer is still wet, apply the solvent cement. Work the cement onto the pipe using a circular motion.
 - 1) Apply a generous and even coat of solvent primer and cement.
 - 2) Do not let the primer or cement puddle inside the fitting or run down inside the pipe.
 - d. Assemble immediately. Push and twist (1/4 turn) socket/fitting onto pipe until it bottoms out.
 - e. Hold pieces together until cement sets. Refer to manufacturer's recommendations for set and cure time schedules.
 - f. Remove excess cement on outside of pipe.
 - g. Fill with water and thoroughly flush before capping off or closing. If there is still a strong smell of solvents in the piping, vapors are being generated.
 - h. Wait for joints to set before disturbing pipe. After cement has set, carefully assemble piping system in the final position.
 - 1) Snake pipe to allow for thermal expansion/contraction.
 - i. Avoid pressurization of system until adequately cured.
 - 4. All work shall conform to Drawing details and the manufacturer's recommendations.
 - 5. Handle all materials in a manner that will not damage the material or its coating.
 - 6. Handle, assemble, and install pipe and fittings in strict conformance with the manufacturer's recommendations and as indicated on Drawings.

7. Maximum pipeline joint deflections and minimum curve radii shall conform with published tables prepared by the manufacturers. Fittings shall be placed at the vertical/horizontal angle points as shown on the Drawings unless otherwise approved by the Engineer. The Contractor shall install additional vertical angle fittings where required to maintain conformance with the manufacturer's published tables on maximum pipeline joint deflections and minimum curve radii. The Contractor may, at his option, install up to one additional coupling per 20-foot length of PVC pipe in lieu of an additional vertical fitting, provided that the installation is in compliance with the manufacturer's recommendations.
 8. Do not over insert bell and spigot pipe. Do not assemble beyond the reference mark.
 9. Steel Rods, Bolts, Lugs, and Brackets: Coat buried steel before backfilling.
 10. Grooved and Shouldered Pipe Joints: Comply with AWWA C606.
 11. Field Welding Materials: Comply with AWWA C206.
 12. High Points:
 - a. Install pipe with no high points.
 - b. If unforeseen field conditions arise that necessitate high points, install air-release valves as directed by Engineer.
 13. Bearing:
 - a. Maintain bearing along entire length of pipe.
 - b. Pipes shall be laid with the bell end ready to receive the next pipe. Bell holes shall be dug, and the trench bottom graded such that the pipe is supported along the barrel and not the bell.
 - c. Do not lay pipe in wet or frozen trench.
 14. In addition to exercising extreme care to keep the inside of the pipe clear of dirt and debris during installation, the Contractor shall insert or place temporary water tight plugs over all ends of the pipe except during periods of continuous observation such as during pipeline installation.
 15. Install access fittings to permit pressure testing performed under this section and disinfection of water system performed under Section 330110.58 - Disinfection of Water Utility Piping Systems.
 16. Maintain 10 feet of horizontal separation between water main and sewer piping.
 17. Maintain 4 feet of horizontal separation between water main and storm drain and/or irrigation piping.
 18. Cover: Per Drawings.
 19. Maintain 1 foot of vertical separation between water main and storm drain, sewer, and/or irrigation crossings.
 20. Location Wire:
 - a. Install over all water main, services, and piping.
 - b. Placement: On top of the pipe and secured with tape at 10-foot (maximum) intervals.
 - c. Locator wire shall be brought to the surface at all valve risers.
- E. Valves: As specified in Section 331419 - Valves for Water Utility Service.
- F. Meters: As specified in Section – 331900.01 – Water Service Metering Equipment.

G. Polyethylene (PE) Film Encasement:

1. Encase all buried ductile-iron pipe, fittings, and valves in PE to prevent contact with surrounding backfill material.
2. Comply with AWWA C105.
3. Terminate encasement 3 to 6 inches above ground where pipe is exposed.

H. Service Connections: As specified in Section 331417 - Site Water Service Utility Laterals.

I. Flanged Joints:

1. Ductile iron flanges shall be assembled in accordance to AWWA C110 Appendix A, AWWA C115 Appendix C, and AWWA C115 Appendix A.

J. Backfilling:

1. Backfilling: Backfill around sides and to top of pipe as specified in Section 312316.13 - Trenching.

K. Disinfection of Potable Water Piping Systems: As specified in Section 330110.58 - Disinfection of Water Utility Piping Systems.

3.4 TOLERANCES

- A. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Install pipe to indicated elevation within tolerance of 5/8 inch.

3.5 FIELD QUALITY CONTROL

A. Testing:

1. Pressure test piping system according to AWWA C600 except as modified below:
 - a. Upon completion of the installation of the water mains and appurtenances, the Contractor shall, in the presence of the Engineer, pressure test all parts of the system.
 - b. Each section of water main between line valves shall be tested separately by closing the adjacent line valves and bring the isolated section up to a test pressure that will cause the pressure at the lowest point in the isolated section to be at least 150 pounds per square inch or 50 pounds per square inch above the maximum working pressure, whichever is greater.
 - c. Conduct hydrostatic test for a minimum of one hour.
 - d. At the end of the test period, the test pressure shall be at least equal to the starting test pressure in order to properly determine the leakage.
 - e. Observe joints, fittings, and valves under test.
 - f. Remove and replace cracked pipes, joints, fittings, and valves showing visible leakage, and retest.

- g. Correct visible leak deficiencies and continue testing at same test pressure for an additional one hour to determine leakage rate.
 - h. Leakage shall not be in excess of 2 gallons per inch of diameter per 1,000 feet of pipe per 24 hours. Leakage shall be determined by pumping water into the closed system from a barrel and maintaining the required pressure or by other means approved by the Engineer.
 - i. If pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size.
 - j. Where leakage is in excess of the specified rate, the amount of leakage shall be reduced by the Contractor to a quantity within the specified rate before the installation is accepted. In addition, the Contractor shall repair all visible leaks.
 - k. The Contractor shall provide all labor, tools, and equipment required to perform the pipe pressure test.
 - l. Where interconnections are made between existing and the new system at other than existing isolation valves the interconnection piping between the existing system and the first new isolation valve will not have to be pressure tested. However, when these interconnections are made and pressurized, any noticeable leaks shall be corrected.
 - m. Where the new system interconnects to an existing system at an existing isolation valve it will be the Contractor's option to either test against the existing isolation valve or to install a temporary thrust protected blind flange, cap or plug within 15 feet of the existing valve to test against.
 - n. If the Contractor elects to test against the existing valve, he shall bear the full responsibility for leakage that may occur through the valve; and no additional allowance will be given for such potential leaks.
 - o. If the second option is used the final connection to the existing valve after the pressure test is completed will not have to be tested but any noticeable leaks shall be corrected.
2. Compaction Testing: As specified in Section 312316.13 – Trenching.
3. Locating Wire Connectivity Testing: The Contractor shall coordinate with the Owner to verify all locating wires on water mains and services are detectable by Owner's equipment prior to acceptance.

END OF SECTION 331413

SECTION 331417 - SITE WATER SERVICE UTILITY LATERALS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Polyvinyl chloride (PVC) pipe.
2. Polyethylene (PE) pipe.
3. Corporation stops.
4. Angle meter stops.
5. Service saddles.

B. Related Requirements:

1. Section 312316.13 - Trenching: Excavation of pipe trench.
2. Section 330110.58 - Disinfection of Water Utility Piping Systems: Flushing and disinfecting of water system.
3. Section 331900.01 - Water Service Metering Equipment: Water meters as required by this Section.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Association of State Highway and Transportation Officials:

1. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

C. American Society of Mechanical Engineers:

1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

D. American Society of Sanitary Engineering:

1. ASSE 1012 - Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent.
2. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers.

E. ASTM International:

1. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
2. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
3. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³).
4. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³).
5. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
6. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
7. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
8. ASTM D2467 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
9. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.
10. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

F. American Welding Society:

1. AWS A5.8/A5.8M - Specification for Filler Metals for Brazing and Braze Welding.

G. American Water Works Association:

1. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.
2. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.
3. AWWA C800 - Underground Service Line Valves and Fittings.
4. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13 mm) Through 3 In. (76 mm), for Water Service.
5. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.

1.4 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Product Data: Submit manufacturer information regarding pipe materials, pipe fittings, corporation stop assemblies, curb stop assemblies, meters, meter setting equipment, service saddles, backflow preventers, and accessories.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- G. Qualifications Statement:
 - 1. Submit qualifications for manufacturer.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of piping mains, curb stops, connections, thrust restraints, pressure-pipe centerline elevations, and gravity-pipe invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 POLYVINYL CHLORIDE (PVC) PIPE

- A. Comply with ASTM D1785.
- B. Schedule: 40.
- C. Fittings: Schedule 40 conforming to ASTM D2466.
- D. Joints: Solvent welded; ASTM D2855.
 - 1. As described in Section 331413 – Public Water Utility Distribution Piping.

2.2 POLYETHYLENE (PE) PIPE

- A. Manufacturers:
 - 1. ADS.
 - 2. Centennial.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Comply with AWWA C901.
 - 2. Material: PE4710.
 - 3. Standard Dimension Ratio (SDR): 9 or as required to connect to existing pipe.
 - 4. Pressure Rating: 200 psi at 73°F.
 - 5. Standard Diameter: Outside diameter controlled, copper tube size (CTS).
 - 6. Joints: No joints allowed in the service pipe.
 - 7. Fittings: CTS restrained compression fittings.
- C. Accessories:
 - 1. Tubing Insert:
 - a. Tubing; Flanged insert.
 - b. Material: 304 stainless steel.
 - c. Dimensions: Suitable for specified high-density polyethylene pipe and compression fittings.

2.3 CORPORATION STOPS

- A. Manufacturers:
 - 1. Mueller 300.
 - 2. Ford.
 - 3. Jones.

4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Comply with AWWA C800.
2. Type: Ball.
3. Body: Brass or red brass alloy.
4. Inlet Threads: AWWA taper, AWWA iron pipe. Inlet threads to correspond to service saddle outlet.
5. Outlet End Connection: Restrained, suitable for service pipe specified.
6. Port: Full.

2.4 ANGLE METER STOPS

A. Manufacturers:

1. Mueller 300.
2. Ford.
3. Jones.
4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Comply with AWWA C800.
2. Type: Quarter-turn ball type with locking wing.
3. Inlet Connection: Restrained compression suitable for the service pipe specified.
4. Outlet Connection: Meter nut or flange suitable for the meter specified.
5. Port: Full.
6. Pressure Rating: 300 psi.
7. Material: Brass.

2.5 SERVICE SADDLES

A. Manufacturers:

1. Romac 202NS.
2. Ford FC 202.
3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Comply with AWWA C800.
2. Body: ASTM A536 ductile iron with nylon or epoxy coating.
3. Outlet Connection: Threaded, AWWA taper or NPT. Outlet threads to correspond to corporation stop, inlet threads.
4. Straps: Dual, manufactured from Type 304 stainless steel per ASTM A240.

5. Hardware: Type 304 stainless steel. Nuts shall be heavy hex per ASTM A194.
6. Pressure Rating: Equal to pressure rating of the pipe, minimum.

2.6 WATER METERS

- A. As specified in Section 331900.01 - Water Service Metering Equipment.

2.7 MATERIALS

- A. Bedding and Backfill: As specified in Section 312316.13 - Trenching.

2.8 ACCESSORIES

- A. Location Wire: As specified in Section 331413 - Public Water Utility Distribution Piping.
- B. Meter Boxes: As specified in Section 331900.01 – Water Service Metering Equipment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that building service connections and municipal utility water main sizes, locations, and inverts are as indicated on Drawings.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
- C. Remove scale and dirt from inside and outside of piping before assembly.
- D. Prepare pipe connections to equipment with flanges or unions.

3.3 INSTALLATION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. Corporation Stop:
 1. Make connection for each different kind of water main, using suitable materials, equipment, and methods as approved by Engineer.

2. Provide service saddles for all mains. Tapping of mains is not allowed.
 3. Location:
 - a. Screw corporation stops directly into service saddle at 10- and 2-o'clock positions along main's circumference.
 - b. Locate and stagger corporation stops at least 4 feet apart longitudinally.
 - c. Locate corporation stops at least 4 feet from all fittings and pipe bells.
 4. Do not backfill and cover service connections until installation has been approved by Engineer.
- C. Excavation, Bedding, and Backfill: As specified in Section 312316.13 - Trenching.
- D. Pipe and Fittings:
1. As specified in Section 331413 - Public Water Utility Distribution Piping.
 2. Install pipe to allow for expansion and contraction without stressing pipe or joints.
 3. Install access fittings to permit disinfection of water system.
- E. Curb Stop Assemblies:
1. Set curb stops as indicated on Drawings.
 2. Boxes:
 - a. Center and plumb meter boxes over curb stops and meter.
 - b. Set box cover flush with finished grade.
- F. Water Meters: As specified in Section 331900.01 - Water Service Metering Equipment.
- G. Service Connections:
1. Install water service as indicated on Drawings.
- H. Disinfection of Water Piping System: Flush and disinfect system as specified in Section 330110.58 - Disinfection of Water Utility Piping Systems.
- 3.4 FIELD QUALITY CONTROL
- A. Testing: As specified in Section 331413 - Public Water Utility Distribution Piping.
- B. Compaction Testing: As specified in Section 312316.13 - Trenching.

END OF SECTION 331417

SECTION 331419 - VALVES FOR WATER UTILITY SERVICE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gate valves.
2. Valve boxes.

B. Related Requirements:

1. Section 330110.58 - Disinfection of Water Utility Piping Systems: Requirements for flushing and disinfecting.
2. Section 331413 - Public Water Utility Distribution Piping: Pressure testing of valves.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Water Works Association:

1. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
2. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.
3. AWWA C515- Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
4. AWWA C550 - Protective Interior Coatings for Valves.

C. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work of this Section with installation of water mains.

1.5 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.6 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Product Data: Submit manufacturer information regarding component materials, fittings, assembly and parts diagram, and accessories.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- F. Source Quality-Control Submittals: Indicate results of factory tests and inspections.
- G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.7 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of valves.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Tools: Furnish one tee wrench of required length to Owner.

1.9 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Perform Work according to AWWA standards.

- E. Cast manufacturer's name, pressure rating, and year of fabrication into valve body.

1.10 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum five years' documented experience.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Delivery:
 - 1. Seal valve and hydrant ends to prevent entry of foreign matter.
 - 2. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 GATE VALVES – UNDER 4 INCHES

- A. Manufacturers:
 - 1. American Flow Control.
 - 2. Mueller Co.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Type: Resilient-seated, comply with AWWA C509.
 - 2. Stem: Non-rising stem (NRS).
 - 3. Coating and Lining: NSF 61-certified fusion-bonded epoxy, comply with AWWA C550.
 - 4. End Connections: As shown on the Drawings.

C. Operation:

1. Opening Direction: Counterclockwise.
2. Exposed: Hand wheel operator.
3. Buried: 2-inch square operating nut.

D. Materials:

1. Wedge: Resilient, fully encapsulated with Buna-N.
2. Body and Bonnet: Ductile iron.
3. Stem: Bronze.

2.2 VALVE BOXES

A. Provide for all buried valves.

B. Manufacturers:

1. Christy G-5.
2. Cook Concrete Products No. 10T12.
3. Brooks Products No. 1-RT.
4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

C. Description:

1. Traffic Rating: H-20.
2. Lid: Bolt down cast iron with machined mating surface.
3. Lid Inscription: WATER.
4. Ring: Cast iron with machined mating surface.
5. Extensions: 8-inch diameter PVC pipe. Extensions shall be centered and notched to fit over valve bonnet and sealed with polyurethane foam, mortar, or other Engineer approved sealant to prevent soil migration into the extension.

2.3 ACCESSORIES

A. Valve boxes shall be furnished with 8-inch PVC pipe extension sleeves, if needed.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Determine exact location and size of valves from Drawings.
- B. Identify required lines, levels, contours, and datum locations.
- C. Verify that elevations of existing facilities prior to excavation and installation of valves are as indicated on Drawings.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Locate, identify, and protect from damage utilities to remain.
- C. Do not interrupt existing utilities without permission and without making arrangements to provide temporary utility services.
 - 1. Notify Engineer not less than two working days in advance of proposed utility interruption.
 - 2. Do not proceed without written permission from Engineer.

3.3 INSTALLATION

- A. Perform trench excavation, backfilling, and compaction as specified in Section 312316.13 - Trenching.
- B. Install valves in conjunction with pipe laying.
- C. Provide buried valves with valve boxes installed per Drawings.
- D. Orientation:
 - 1. Set valves plumb.
- E. Disinfection of Water Piping System: Flush and disinfect valves with water mains as specified in Section 330110.58 - Disinfection of Water Utility Piping Systems.

3.4 FIELD QUALITY CONTROL

- A. Testing: Pressure test valves with water mains as specified in Section 331413 - Public Water Utility Distribution Piping.

END OF SECTION 331419

SECTION 331900.01 - WATER SERVICE METERING EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Water meters.
2. Registers.
3. Cellular endpoints.
4. Meter boxes.

B. Related Requirements:

1. Section 312316.13 - Trenching.
2. Section 331413 - Public Water Utility Distribution Piping: Requirements for domestic water piping from supply to utility source connection at Site.
3. Section 331417 - Site Water Service Utility Laterals.

1.2 DEFINITIONS

- A. AMI: Automated metering infrastructure – cellular-based using existing cellular network technology that requires no infrastructure to install or maintain.

1.3 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.4 REFERENCE STANDARDS

A. American Water Works Association:

1. AWWA C700 - Cold-Water Meters - Displacement Type, Metal Alloy Main Case.
2. AWWA C707 - Encoder-Type Remote-Registration Systems for Cold-Water Meters.
3. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.

B. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

1.5 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.6 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: Submit manufacturer information for water meters and accessories.
- C. Manufacturer's Certificate: Certify that water meters meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. Manufacturer Reports:
 - 1. Certify that equipment has been installed according to manufacturer's instructions.
 - 2. Indicate activities on Site, adverse findings, and recommendations.
- G. Qualifications Statements:
 - 1. Submit manufacturer's approval of installer.
- H. Water Meter Data Log:
 - 1. Prior to water meter work, the Contractor shall submit to the Engineer for approval a water meter data log. When approved, this data log will be used by the Contractor throughout the project to enter new water meter data.
 - 2. The meter data log shall include the following information:
 - a. Meter site name.
 - b. Description of meter location (e.g., location from surface landmarks such as sidewalks, fences, property lines, etc.).
 - c. Date and time of meter work.
 - d. New meter size.
 - e. New meter and/or register serial numbers.
 - f. New endpoint transmitter number.
 - g. Barcode meter endpoint transmitter information.
 - h. Totalizer reading on the new meter.
 - i. Notes and comments during installation.
 - j. Water meter testing.
 - k. Confirmation that the new meter communicates with Owner's software and is identified with the Owner's unique customer number.
 - l. Review and initials of Owner's Representative.

I. Photos:

1. At each meter installation, the Contractor shall take a digital photo of each meter and post-meter installation work.
 - a. Take clear digital photos with date and time stamp. Photos shall include at least one clear photo for each of the following:
 - 1) Meter pit.
 - 2) Serial numbers of meter and transmitter.
 - 3) Post install work area.
 - 4) All piping modifications prior to backfilling.
 - b. Each photo should be identified by site as shown on the Drawings.
 - c. Provide photos to the Owner on a flash drive in a format approved by the Owner at the end of installations of meters on the project.

1.7 CLOSEOUT SUBMITTALS

- A. Refer to the Standard General Conditions - Record Documents.
- B. Refer to Engineer's Supplementary Conditions - EQUIPMENT INFORMATION.
- C. Water Meter Data Log:
 1. The Contractor shall submit a copy of the Water Meter Data Log after installation of meters is complete.
 2. Upon completion of the Project, the Contractor shall submit to the Owner both a paper copy and electronic version (Microsoft Excel) of the Water Meter Data Log.

1.8 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Perform Work according to AWWA M6, Water Meters - Selection, Installation, Testing, and Maintenance.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 20 years' documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum five years' documented experience and approved by manufacturer.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.11 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements, meter sizes, and work to be completed prior to construction.

1.12 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. The AMI endpoint/transmitter and meter (including the register) shall have a 10-year full warranty plus 10 years pro-rated warranty, including guarantee of network coverage.

PART 2 - PRODUCTS

- 2.1 Refer to the Drawings for summary of new meter installs and meter retrofits.

2.2 WATER METERS

A. Manufacturer to meet Owner’s existing standardized metering system:

1. Badger Meter.

a.

Meter Size	Meter Model
3/4”	Model 35 bronze disc meter with cast iron bottom
1 1/2	Model 120 bronze disc meter, two-bolt elliptical flange with test plug

2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Comply with AWWA C700.
2. Type: Positive displacement disc.
3. Housing Material: Bronze.
4. Submersible for an extended period of time.
5. Lead-free.

C. Performance and Design Criteria:

1. Service: Cold water, 122°F.
2. Maximum Operating Pressure: 150 PSIG.
3. Minimum Accuracy: 1.5 percent.

2.3 REGISTERS

A. Manufacturer must be capable of working with existing Badger Meter water meters.

1. Badger Model HR-E LCD encoder register.

a.

Meter Size	Register Programmed To
3/4”	Model 35
1 1/2”	Model 120

2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Hermetically sealed.
2. Display: LCD.
3. Digits: 9.
4. Unit of Measurement: Gallons.
5. Leak detection indicator.
6. Tamper-protected.

7. Non-removable with set screw.
8. Five-foot twist-tight connector with cable shield for rodent deterrent.
9. Alerts include leak detection, no recent flow, backflow, continuous flow, cut wire indication, low battery indication, and remote clock synchronization.
10. Retrofit existing Badger meters without removal from service.
11. Field programmable option.
12. 20-year battery life.

2.4 CELLULAR ENDPOINTS

A. Manufacturers:

1. Badger Orion LTE-M Cellular.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Network as a Service: Public cellular network with cellular endpoints to provide 15-minute interval data.
2. Software as a Service: Include technical support, software upgrades and data hosting.
3. Endpoint Communication: Existing cellular network technology that requires no infrastructure to install or maintain.
 - a. Utilize existing Internet of Things (IoT) cellular infrastructure.
 - b. Secure two-way communication.
 - c. LTE-M cellular network.
 - d. 15-minute interval data delivered 4x per workday.
 - e. Three of the four weekday communication times are configurable to align with utility daily processes.
4. Smart Activation: No field programming or special tools required. Endpoint begins broadcasting data when the encoder senses the first usage of water.
5. Include consumer engagement web portal and smartphone/tablet app.
6. 8-inch twist-tight connector with cable shield for rodent deterrent.
7. Install through the lid.
8. Provide field services and support staff available for onsite training and support.
9. Provide Technical Support 800 Call Center available 7:00 a.m. to 3:00 p.m. PST.

2.5 METER BOXES AND LIDS

A. Manufacturers:

1. Cook Concrete.
2. Christy.
3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Location: Landscaped areas and other areas with little to no vehicle access.
 - a. Lid: Reinforced concrete lid.
 - 1) Accessories:
 - a) Two-inch probe hole compatible with Badger endpoints.
 - b) Markings: Water.
 - b. Box: High density reinforced concrete with non-settling shoulders positioned to maintain grade.
 - c. Extensions: 12-inch reinforced concrete.
2. Location: In shoulder, alleys, and driveways with light vehicle traffic:
 - a. Lid: Steel checker plate cover.
 - 1) Accessories:
 - a) 2-inch probe hole compatible with Badger endpoints.
 - b) Markings: Water.
 - b. Box: High density reinforced concrete with non-settling shoulders positioned to maintain grade.
 - c. Extensions: 12-inch reinforced concrete.
3. Inside Dimensions:

Meter Size	Lay Length (inch)	Minimum Inside Dimensions (inch)
¾"	9	12 x 20
1 ½"	12.625	13 x 24

2.6 ACCESSORIES

- A. All applicable appurtenances and integration services required to achieve a functioning system with the District's existing equipment shall be included at no additional cost to the Owner.

2.7 SOURCE QUALITY CONTROL

- A. Test meters according to AWWA M6.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify service connections and meter sizes in the field to then obtain the necessary connection appurtenances and replacement parts required.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Pipe Cutting:
 - 1. Where pipe cutting is necessary, perform all Work of cutting pipe and fittings or special castings necessary to the proper and accurate assembly, erection, and completion of the water meter installation.
 - 2. All pipe shall be cut to fit accurately without damaging the pipe so as to leave a smooth end at right angles to the axis of the pipe.
 - 3. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
- C. Before attaching meter, ensure that pipe ends are deburred, square, and plumb and that scale and dirt on inside and outside of piping has been removed.
- D. Prepare pipe connections to equipment with flanges or unions, as appropriate.
 - 1. Where existing flanged connections are encountered, remove the existing flange gaskets, clean the existing flange face, and install a new, approved flanged gasket prior to installing the new or used meter.
 - 2. Flanged joints shall be made up square and watertight with even pressure on the new gaskets.
- E. Protect and support existing distribution piping as Work progresses.

3.3 INSTALLATION

- A. Operation of Distribution System Valves:
 - 1. The Contractor shall not operate any distribution line valves.
 - a. Owner staff will perform all water main isolations.
 - 2. Preschedule any required water main shutdowns with the Owner not less than 72 hours in advance of the planned need.
 - a. Water main shutdowns should be used as a last resort and done minimally.
 - 3. Notify the Owner immediately if any water system failure or leakage is found and cooperate with Owner's staff as needed to allow for timely repair of leak stoppage.

B. Work Performed by Owner:

1. Although not anticipated, the Contractor is advised that the Owner retains the option of performing work at any given service location(s) with Owner crews all or a portion of any work involved in repairing or replacing an existing water service meter or installation of end points.
2. Any such work performed by Owner will be at the discretion and convenience of the Owner.
3. The Contractor shall alter his operations to accommodate Owner crew with no request for additional time or compensation.

C. Excavation, Bedding, and Backfill: As specified in Section 312316.13 - Trenching.

D. Service Connections:

1. Install water service as shown in the Standard Details located in the Drawings and as specified in Section 331417 – Site Water Service Utility Laterals.

E. Water Meters:

1. Install meters according to AWWA M6, with isolating valves on inlet (angle meter stop) and outlet (customer's isolation valve), as indicated in the Standard Details located in the Drawings.
2. Take post-meter installation digital photos.
3. Installation of the new water meter and appurtenances shall be done in such a manner as to not cause any residential or commercial buildings to be without water for more than one hour at a time. Maximum time of interruption to any residential or commercial building shall not exceed four hours unless unusual or unavoidable circumstances are encountered, and Owner's representative is notified in advance.
4. All water meters shall be disinfected as indicated herein.
5. All water meters shall be flushed and tested as indicated herein immediately following installation.
6. New water meters shall be installed within existing: 1) landscaped areas, 2) gravel surfaces, 3) HMA paving, or 4) concrete surfaces. The Drawings indicate the expected new meters' surface restoration requirement for each meter.
 - a. If surface restoration is not defined, the surface restoration shall be gravel surface unless in landscaped area.
 - b. When meter work falls within lawns, landscaping, and/or park areas, the Contractor shall make every effort to minimize excavation and disruption of the existing lawn or landscaped areas while performing work.
 - c. All excavated landscape areas shall be backfilled with select native backfill to original surface grade. All lawns and landscaping shall be replaced in kind.
7. All Contractor work and materials necessary to replace an existing meter that falls beyond 36 inches from the outside of the existing meter box location shall be considered EXTRA WORK.
 - a. The Contractor shall notify the Engineer if such revisions to the water service are necessary **prior** to performing the work; otherwise, work done shall be at no additional cost to the Owner.

F. Connection to Customer's Existing Service Pipe:

1. Connecting new and existing meters to the existing customer's service shall require miscellaneous pipe materials, including PVC, copper, polyethylene, and galvanized steel pipe.
2. Connect to whichever type of pipe is encountered.
3. Do not thread male metallic fittings into female PVC fittings, but rather thread male PVC fittings into female fittings if necessary.
4. Connection shall be made with a restrained bronze compression fitting per the Standard Details located in the Drawings.

G. Line Breaks or Leaks:

1. Line breaks or leaks on the Owner or customer side of the meter that occur during the installation shall be reported to the Owner and repaired immediately by Contractor.
 - a. Breakage in the immediate area where the Contractor has worked will be assumed to be caused by Contractor and repair work shall be completed at no additional cost to Owner.
2. Line breaks or leaks that are observed before installation shall immediately be reported to the Owner.
 - a. Repairs, if necessary, will be performed by the Contractor as EXTRA WORK as determined by the Owner.

H. Disinfection and Flushing:

1. All new pipe, meters, tailpieces, existing fittings, and piping shall be sprayed or swabbed inside and out with a strong, 1% to 5%, chlorine solution prior to installation and installed in a sanitary manner so as not to contaminate any and all parts of the water service system.
2. Prior to connecting a meter to the customer's service pipe, flush the meter by opening the angle meter stop and allowing the water to flush through the meter until water runs clear.
 - a. Cap or plug the customer service line to prevent this flushing water from entering the customer service line.
 - b. The Contractor shall not leave the work site unless the customer's service line is appropriately capped.
3. Immediately after the water meter is installed complete, all parts of the water service system shall be flushed through all exterior faucets for a minimum of two minutes and until water runs clear.
 - a. Coordinate with customer to open all exterior faucets.
 - b. After flushing all exterior faucets, attempt to have customer open all interior faucets to help prevent fixtures from plugging.
 - 1) The Contractor is not to enter the inside of the residence without prior authorization and accompaniment by the Owner but shall rather immediately notify the Owner of any interior issues identified.

- c. If the customer is not available, able, or willing to operate the faucets and hose bibs, perform the flushing from the hose bib nearest to or on the water piping where it enters the home.
 - d. Immediately notify the Owner and customer if the flush water fails to clear within five minutes.
 - 1) If the service water fails to clear, cooperate with the Owner to clear the water or perform work as needed to satisfy the Owner that the dirty or turbid water was not caused by Contract work.
 - e. Flushing may occur concurrently with testing.
- 4. If the Contractor fails to take the proper precautions during connections to the existing system and allows contaminants to enter any and all parts of the water service system, the applicable service lines shall be flushed from the hose bib nearest to or on the water piping where it enters the home, until water runs clear and a free chlorine residual is achieved.
 - 5. Flushing shall be completed at all installations until the Owner's Representative is satisfied with the work, at no additional cost to the Owner.
- I. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.4 FIELD QUALITY CONTROL

A. Testing:

- 1. All new water meters shall be tested. Meters shall be tested within 48 hours of meter installation. Coordinate with the water service customer to discharge and capture a minimum of 1 cubic foot (7.48 gallons) of water through the new service at an approved water connection (e.g., exterior hose bib).
 - a. Capture the water being discharged using a calibrated container, approved by the Owner, to compare the total volume discharged from the service with the recorded meter volume.
 - b. The meter's register and the leak detection finder shall be observed for proper operation during this test.
 - c. If it is determined that the new replacement meter and register fails to record this volume to within 2 percent of the actual discharge volume, a retest shall be performed immediately by the Contractor.
 - d. If this subsequent test indicates that the new meter and register fails to accurately record within two percent of the actual discharged water volume, the Contractor shall replace the meter and register at no additional cost to the Owner.
- 2. The Contractor shall provide all labor, tools, and equipment required to perform meter testing.

3. Demonstrate that the approved infrastructure recognizes the new AMI meter signal, the new meter is identified with the Owner's billing account number, and the accumulated volume through the meter.
 - a. This shall be verified with the Owner's personnel after the system is installed to ensure a successful transmission.
 - b. If the AMI meter signal does not communicate as it is supposed to do, the Contractor shall verify the endpoint transmitter is installed correctly. If the endpoint transmitter is installed correctly and still does not communicate with the AMI, the Contractor shall install a new endpoint transmitter at the meter, at no additional cost to the Owner.
- B. Manufacturer Services:
 1. Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than two days on site for installation, inspection, startup, field testing, AMI system integration, and instructing Owner's personnel in maintenance of equipment.
- C. Upon completion of all meter replacements, the Owner's Representative shall inspect the meter body, register, and all connections for leakage. Any visible leakage shall be repaired by the Contractor immediately.
- D. Equipment Acceptance:
 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 2. Make final adjustments to equipment under direction of manufacturer's representative.
- E. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

END OF SECTION 331900.01

SECTION 400507 - HANGERS AND SUPPORTS FOR PROCESS PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formed-steel channel (Type 2 Pipe Support).
2. Fiber reinforced polymer (FRP) channel (Type 2 Pipe Support).
3. Floor supports (Type 3 Pipe Support).

B. Related Requirements:

1. Section 031000 - Concrete Forming and Accessories.
2. Section 033000 - Cast-in-Place Concrete: Execution requirements for placement of concrete housekeeping pads specified by this Section.
3. Section 099000 - Painting and Coating: Product and execution requirements for painting specified by this Section.
4. Section 400560 - Process Valves.
5. Section 402319.01 - Process Piping.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Welding Society:

1. AWS D1.1 - Structural Welding Code - Steel.

C. ASME International:

1. ASME B31.1 - Power Piping.
2. ASME B31.9 - Building Services Piping.

D. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A47 - Standard Specification for Ferritic Malleable Iron Castings.
3. ASTM A181 - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.
4. ASTM A576 - Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality.

- E. Manufacturers Standardization Society of the Valve and Fittings Industry:
 - 1. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacturer, Selection, Application, and Installation.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work of this Section with piping and equipment connections specified in other Sections and as indicated on Drawings.

1.5 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.6 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- C. Product Data: Submit manufacturer information, including load capacity.
- D. Shop Drawings: Indicate system layout with location, including critical dimensions, sizes, hanger and support locations, and details of trapeze hangers, anchors, and guides.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.
- G. Manufacturer Instructions: Submit special procedures and assembly of components.
- H. Qualifications Statements:
 - 1. Submit qualifications for manufacturer, fabricator, installer, and licensed professional.
 - 2. Submit manufacturer's approval of installer.

1.7 QUALITY ASSURANCE

- A. Perform Work according to AWS D1.1/D1.1M for welding hanger and support attachments to building structure.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum three years' documented experience.
- B. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' documented experience.
- C. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.10 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.11 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 FORMED-STEEL CHANNEL (TYPE 2 PIPE SUPPORT)

- A. Manufacturers:
 - 1. B-Line.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Material: Galvanized steel.
2. Thickness: 12 gauge.
3. Mounting Holes: 1-1/2 inches O.C.
4. Hardware: Galvanized steel.

2.2 FIBER REINFORCED POLYMER (FRP) CHANNEL (TYPE 2 PIPE SUPPORT)

A. Manufacturers:

1. B-Line.
2. Strut-Tech.
3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Channel shall be interchangeable with industry standard 1 $\frac{5}{8}$ -inch steel and fiberglass channel framing systems.
2. Material: Fiber reinforced polyester resin with polyester surface veil.
3. Hardware: Polyurethane.

2.3 FLOOR SUPPORTS (TYPE 3 PIPE SUPPORT)

A. Manufacturers:

1. Anvil.
2. B-Line.
3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Adjustable.
2. Material: Carbon steel.
3. Coating: Hot-dip galvanized.
4. Support:
 - a. Pipe saddle.
 - b. Flange Mount: ANSI B16.5 Class 150 or 300 bolt pattern as required to match piping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field dimensions as indicated on Drawings.

3.2 INSTALLATION

- A. Install with adhesive anchors or wedge anchors as shown on the Drawings. Anchors shall be installed per the manufacturer's ICC-ES Report.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Obtain permission from Engineer before drilling or cutting structural members.
- D. Inserts:
 - 1. Placement:
 - a. Concrete forms.
 - b. Reinforced concrete slabs and sides of reinforced concrete beams.
 - 2. Concrete Slabs Forming Finished Ceiling: Locate inserts flush with slab surface.
- E. Pipe Hangers and Supports:
 - 1. All piping and conduit shall be properly supported by anchor brackets, saddle, or hangers. Piping must not be able to move freely and must not be vulnerable to damage by accidental means of a stumbling or leaning person.
 - 2. Supports:
 - a. Support horizontal and vertical piping at maximum 5-foot intervals or as indicated on the Drawings. Supports for 2-inch and smaller PVC shall be 4-foot maximum.
 - b. Provide at each change of direction and at the ends minimum.
 - c. Independently of equipment.
 - d. Riser Piping: Independent of connected horizontal piping.
 - 3. Minimum Vertical Adjustment: 1-1/2 inches.
 - 4. Piping in Parallel at Same Elevation: Provide multiple pipe or trapeze hangers.
 - 5. Clamps and Brackets:
 - a. Provide welded steel brackets if piping is to be run adjacent to building walls or columns.
 - b. Use beam clamps if piping is to be suspended from building steel.
 - c. Insulated Piping: Provide two bolted clamps designed to accommodate insulated piping.
 - d. Use offset clamps if pipes are indicated as offset from wall surfaces.
- F. Insulation:
 - 1. Provide clearance in hangers and from structure and other equipment for installation of insulation.
- G. Equipment Bases and Supports:
 - 1. Housekeeping Pads:

- a. Material: Concrete, as specified in Section 033000 - Cast-in-Place Concrete.
- b. Minimum Thickness: As indicated on Drawings.
- c. Plan Area: Extend 6 inches beyond supported equipment.

H. Finishes:

1. Prime coat exposed steel hangers and supports as specified in Section 099000 - Painting and Coating.
2. Hangers and supports located in crawlspaces, pipe shafts, and suspended ceiling spaces are not considered as exposed.

3.3 ATTACHMENTS

A. Pipe Hanger Spacing:

1. Pipe Material: PVC.
 - a. Maximum Hanger Spacing: 4 feet.
 - b. Hanger Rod Diameter: 3/8 inch.
2. Pipe Material: Steel.
 - a. Size: 3 inches and smaller.
 - b. Maximum Hanger Spacing: 12 feet.
 - c. Hanger Rod Diameter: 1/2 inch.

END OF SECTION 400507

SECTION 400553 - IDENTIFICATION FOR PROCESS PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Tags.
2. Labels.

B. Related Requirements:

1. Section 099000 - Painting and Coating: Requirements for painting as specified by this Section.
2. Section 402319.01 - Process Piping.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. ASME International:

1. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.4 PREINSTALLATION MEETINGS

A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.5 SUBMITTALS

A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Product Data: Submit manufacturer's catalog literature for each specified product.

C. Shop Drawings:

1. Indicate list of wording, symbols, letter size, and color-coding for piping and mechanical identification and valve chart and schedule.

2. Indicate valve tag number, location, function, and valve manufacturer's name and model number.

- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

1.7 QUALITY ASSURANCE

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Piping Color Scheme and Lettering Size: Comply with ASME A13.1.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 TAGS

- A. Plastic Tags:
 1. Manufacturers:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.
 - c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.

- f. emedco.
- g. Marking Services, Inc.
- h. Seton Identification Products.
- i. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
- j. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2. Description:

- a. Laminated three-layer plastic with engraved black letters on light, contrasting background color.
- b. Minimum Tag Size and Configuration: 1-1/2 inches; square.

3. Label Content:

- a. Include equipment's Drawing designation and unique equipment number.

4. Equipment Label Schedule:

- a. For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper.
- b. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified.
- c. Equipment schedule shall be included in operation and maintenance data.

B. Metal Tags:

1. Manufacturers:

- a. Brady Corporation.
- b. Carlton Industries, LP.
- c. Craftmark Pipe Markers.
- d. emedco.
- e. Marking Services, Inc.
- f. Seton Identification Products.
- g. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
- h. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

2. Description:

- a. Stainless-steel construction; stamped letters.
- b. Minimum Tag Size and Configuration: 1-1/2 inches; square with finished edges.

2.2 LABELS

A. Exposed Pipe Label:

1. Manufacturers:

- a. Industrial Safety Solutions.

- b. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - c. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
2. Description:
- a. Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.
 - b. Labeling color and text size shall conform to ANSI/ASME A13.1.
 - c. Rated for indoor and outdoor exposure.
 - d. Labels shall show direction of flow and indicate process media.
 - e. Contractor shall coordinate with the Owner on how the text shall read.

PART 3 - EXECUTION

3.1 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

- A. According to manufacturer instructions.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Install identifying devices after completion of coverings and painting.
- D. Install plastic nameplates with corrosion-resistant mechanical fasteners or adhesive.
- E. Labels:
 - 1. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer.
 - 2. For unfinished covering, apply paint primer before applying labels.
- F. Tags:
 - 1. Identify valves in main and branch piping with tags.
 - 2. Install tags using corrosion-resistant chain.
 - 3. Number tags consecutively by location.
- G. Piping:
 - 1. Identify piping, concealed or exposed, with label.
 - 2. Use tags on piping 3/4-inch diameter and smaller.

3. Identify service, flow direction, and pressure.
4. Install in clear view and align with axis of piping.
5. Locate identification not to exceed 20 feet on straight runs, including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.

END OF SECTION 400553

SECTION 400560 - PROCESS VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gate valves - exposed, under 4 inches.
2. Check valves - under 3 inches.
3. Ball valves - bronze or brass.
4. Combination air valves (CAV) for water service.
5. Pressure relief valve.

B. Related Requirements:

1. Section 402319.01 - Process Piping.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 012100 - Measurement and Payment.

1.3 DEFINITIONS

A. OUTSIDE SCREW AND YOKE (OS&Y) VALVE: A valve in which the operating screw is driven by a threaded nut that is built into the handle.

B. NRS: Non-rising stem.

1.4 REFERENCE STANDARDS

A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. American Water Works Association:

1. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C508 - Swing-Check Valves for Waterworks Service, 2-In. through 24-In. NPS.
3. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.
4. AWWA C512 - Air Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.
5. AWWA C550 - Protective Interior Coatings for Valves and Hydrants.
6. AWWA C800 - Underground Service Line Valves and Fittings.

C. ASME International:

1. ASME B1.20.1 - Pipe Threads, General Purpose, Inch.

2. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
3. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard.
4. ASME B16.11 - Forged Fittings, Socket-Welding and Threaded.
5. ASME B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300.

D. ASTM International:

1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
2. ASTM A351 - Standard Specifications for Castings, Austenitic, for Pressure Containing Parts.
3. ASTM A536 - Standard Specification for Ductile Iron Castings.
4. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
5. ASTM B148 - Standard Specification for Aluminum-Bronze Sand Castings.
6. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.
7. ASTM D1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
8. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.
9. ASTM D3222 - Standard Specification for Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
10. ASTM D4101 - Standard Specification for Propylene Injection and Extrusion Materials.
11. ASTM F1970 - Standard Specification for Special Engineered Fittings, Appurtenances, or Valves for Use in Polyvinylchloride (PVC) or Chlorinated Polyvinylchloride (CPVC) Systems.

E. NSF International:

1. NSF 61 - Drinking Water System Components – Health Effects.
2. NSF 372 - Drinking Water System Components – Lead Content.

F. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP-81 - Stainless Steel or Stainless Steel Lined, Bonnetless, Knife Gate Valves with Flanged Ends.
2. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

G. International Organization for Standardization:

1. ISO 9001 - Quality Management Systems.

1.5 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Coordinate Work of this Section with piping and equipment connections as specified in other Sections and as indicated on Drawings.

1.6 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.7 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Product Data: Submit manufacturer's catalog information, indicating materials of construction and compliance with indicated standards.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Source Quality-Control Submittals: Indicate results of factory tests and inspections.

1.8 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of piping, valves and other appurtenances, connections, and invert elevations.

1.9 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Perform Work according to AWWA standards.

1.10 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Protect valves and appurtenances by storing off ground.
 - 3. Provide additional protection according to manufacturer instructions.

1.12 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.13 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 GATE VALVES – EXPOSED, UNDER 4 INCHES

- A. Manufacturers:
 - 1. Apollo.
 - 2. NIBCO.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Type: Non-rising stem.
 - 2. Cold Working Pressure: 200 psi non-shock.
 - 3. Disc: Solid bronze.
 - 4. End Connections: Class 125 threaded.
 - 5. Operator: Handwheel.
 - 6. Body: Bronze.
 - 7. Opening Direction: Counterclockwise.

2.2 CHECK VALVES – UNDER 3 INCHES

A. Manufacturers:

1. Apollo.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Type: Bronze swing.
2. Class 125 threaded end connections.

2.3 BALL VALVES - BRONZE OR BRASS

A. Manufacturers:

1. Apollo.
2. Hammond.
3. Nibco.
4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Pressure Rating: 600 psi cold working pressure.
2. Body: Two-piece, bronze or brass.
3. Connections: Threaded.
4. Ball: Full port, chrome-plated brass or Type 316 stainless steel.
5. Stem: Blowout-proof, brass or stainless steel.
6. Seats: Reinforced polytetrafluoroethylene (RPTFE).
7. Packing: Polytetrafluoroethylene (PTFE).

2.4 COMBINATION AIR VALVES (CAV) FOR WATER SERVICE

A. Manufacturers:

1. A.R.I., D-040-C.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Type:
 - a. Fully automatic, float operated with rolling seal mechanism.
 - b. Body: Single.
2. Size: As indicated on Drawings.
3. Suitable for potable or raw water service.

4. Maximum Operating Pressure: 250 psi.
5. Minimum Operating Pressure: 3 psi.

C. Materials:

1. Shell: Ductile iron.
2. Body: Reinforced nylon.
3. Rolling Seal: EDPM.
4. Base: 3/4- and 1-inch stainless steel. 2-inch ductile iron.
5. Hardware: Stainless steel.

D. End Connections:

1. Threaded, NPT.
2. Size: As shown on the Drawings.

2.5 PRESSURE RELIEF VALVES

A. Manufacturers:

1. CLA-VAL Model 50-01.
2. OCV Model 108-2.
3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Valve opens fast on increasing upstream pressure and closes gradually on decrease in upstream pressure to maintain minimum set-point upstream pressure regardless of changing flow rate or varying downstream pressure.
2. Type: Pilot operated.
3. Indicator Rod: Attached to piston for visual position indication.

C. Pilot Valves:

1. Type: Direct acting diaphragm valve.
2. Pilot control system shall include strainer, a fixed orifice speed, and all control accessories.

D. End Connections:

1. Threaded, ASME B1.20.1.

E. Performance and Design Criteria:

1. Set-Point Upstream Pressure:
 - a. 100 psig.
 - b. Range: Field adjustable from near zero to 110 percent.

F. Materials:

1. Body: Bronze.
2. Disc and Diaphragm: Buna-N rubber.
3. Trim: Bronze.
4. Stem, Nut, and Spring: Stainless steel.
5. Control Tubing: Copper.
6. Control Fittings: Brass.

G. Lining and Coating: NSF 61-certified fusion-bonded epoxy, comply with AWWA C116.

H. Accessories:

1. Drain to atmosphere.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field dimensions are as indicated on Drawings.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Thoroughly clean end connections before installation.
- C. Close pipe and equipment openings with caps or plugs during installation.
- D. Surface Preparation: Clean surfaces to remove foreign substances.

3.3 INSTALLATION

- A. According to applicable referenced standards and as shown on the Drawings.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Plumb air release/vacuum discharge piping from valves as shown/indicated on the Drawings.
- D. When connecting brass/bronze valves and fittings to galvanized pipe, apply plumbers' tape to threads.
- E. Prior to installation of valves, all piping shall be flushed of debris and all foreign matter.
- F. Firmly support valves to avoid undue stress on piping.

3.4 FIELD QUALITY CONTROL

- A. Pressure test valves with piping systems as indicated in Section 402319.01 - Process Piping.
- B. Testing:
 - 1. Demonstrate operation without undue noise or vibration.
- C. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.
 - 3. Repair damaged coatings with material equal to original coating.
 - 4. Repair visual leaks.

3.5 CLEANING

- A. Keep valve interior clean as installation progresses, especially when connecting to field-threaded pipe.
- B. After installation, clean valve interior of soil, grit, and other debris as part of pipe system cleaning.
- C. Keep interior of air release valves clean as installation progresses.

3.6 DEMONSTRATION

- A. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

END OF SECTION 400560

SECTION 400567.13 - REDUCED-PRESSURE ZONE BACKFLOW PREVENTERS FOR PROCESS SERVICE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Reduced-pressure zone backflow preventers.
- B. Related Requirements:
 - 1. Section 330550 - Enclosures.
 - 2. 331413 - Public Water Utility Distribution Piping.
 - 3. Section 402319.01 - Process Piping.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.
- B. American Water Works Association:
 - 1. AWWA C606 - Grooved and Shouldered Joints.
 - 2. AWWA C511 - Reduced Pressure Principle Backflow Prevention Assembly.
- C. ASME International:
 - 1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
- D. ASSE International:
 - 1. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers.
- E. NSF International:
 - 1. NSF 61 - Drinking Water System Components - Health Effects.
 - 2. NSF 372 - Drinking Water System Components - Lead Content.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

- B. Coordinate Work of this Section with installation of process piping.

1.5 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Product Data: Submit manufacturer catalog information regarding backflow preventers and accessories.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer Instructions: Submit special procedures and setting dimensions.
- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- G. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and installer.
 - 2. Submit manufacturer's approval of installer.

1.6 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of backflow preventers.

1.7 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Perform Work according to AWWA standards.
- E. Perform work according to California Plumbing Code.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.

- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Furnish temporary end caps and closures on piping and fittings and maintain in place until installation.
 - 3. Provide additional protection according to manufacturer instructions.

1.9 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.10 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 REDUCED-PRESSURE ZONE BACKFLOW PREVENTERS

- A. Manufacturers:
 - 1. Watts.
 - 2. Zurn.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Comply with AWWA C511.
 - 2. Comply with ASSE 1013.
 - 3. All backflow prevention assemblies shall be approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.
 - 4. Configuration:
 - a. Two independently operating, spring-loaded check valves.
 - b. Diaphragm-type differential pressure-relief valve located between check valves.
 - c. Third check valve will open under back pressure in case of diaphragm failure.

5. Materials:
 - a. Body: Bronze.
 - b. Internal Components: Bronze.
 - c. Seal Rings: EPDM.
6. Connections: Threaded, ANSI B1.20.1.
7. Furnish assembly with two gate valves, strainer, and four test cocks.
8. Size: 1 ½ inches.
9. Working Temperature:
 - a. Maximum: 180 deg. F.
10. Maximum Operating Pressure: 175 psig.

C. Accessories:

1. Strainer: Wye type.
2. End Valves: Full port, quarter-turn ball valves.
3. Air gap fitting.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field dimensions are as indicated on Drawings.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Thoroughly clean end connections before installation.
- C. Close pipe and equipment openings with caps or plugs during installation.
- D. Cleaning: Clean surfaces to remove foreign substances.

3.3 INSTALLATION

- A. According to manufacturer instructions and local code requirements.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Repair damaged coatings with material equal to original coating.

- D. Do not install in vertical position.

3.4 FIELD QUALITY CONTROL

- A. After installation, inspect for interferences and proper supports.
- B. Repair damaged coatings with material equal to original coating.

3.5 CLEANING

- A. Keep interior of backflow preventers clean as installation progresses.

3.6 DEMONSTRATION

- A. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

END OF SECTION 400567.13

SECTION 402319.01 - PROCESS PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Polyvinyl chloride (PVC) pipe and fittings, 3-inch and smaller.
2. Galvanized steel pipe (GSP) and fittings.
3. Brass pipe and fittings.
4. Accessories.

B. Related Requirements:

1. Section 099000 - Painting and Coating.
2. Section 312316.13 - Trenching.
3. Section 330110.58 - Disinfection of Water Utility Piping Systems.
4. Section 400507 - Hangers and Supports for Process Piping.
5. Section 400553 - Identification for Process Piping.
6. Section 400560 - Process Valves.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

A. ASME International:

1. ASME A13.1 - Scheme for the Identification of Piping Systems.
2. ASME B1.20.1 - Pipe Threads, General Purpose, Inch.
3. ASME B16.15 - Cast Copper Alloy Threaded Fittings: Classes 125 and 250.
4. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
5. ASME B16.3 - Malleable Iron Threaded Fittings.
6. ASME B31.3 - Process Piping.

B. ASTM International:

1. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
3. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
4. ASTM B43 - Standard Specification for Seamless Red Brass Pipe, Standard Sizes.

5. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
6. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
7. ASTM D2467 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

C. SSPC: Society for Protective Coatings:

1. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic and Type II - Organic).

D. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

E. American Water Works Association:

1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
4. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
5. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast.
6. AWWA C153 - Ductile-Iron Compact Fittings.
7. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.
8. AWWA C606 - Grooved and Shouldered Joints.
9. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. Through 3 In., for Water Service.

1.4 SUBMITTALS

- A. Certifications as required to comply with American Iron and Steel (AIS) provisions.
- B. Refer to the Standard General Conditions and Supplementary Conditions.
- C. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.

1.6 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be

lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.

- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Perform Work according to ASME B31.3 for installation of piping systems.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.8 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.9 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS, 3-INCH AND SMALLER

- A. Comply with ASTM D1785.
- B. Location: Inside Well 8 Building.
- C. Schedule: 80.

- D. Fittings: Schedule 80 conforming to ASTM D2467.
- E. Joints:
 - 1. Type: Solvent weld.
 - a. Includes primer and cement.
 - b. Certified by NSF for use with potable water.
 - c. Compatible with the material being conveyed by the piping system.

2.2 GALVANIZED STEEL PIPE (GSP) AND FITTINGS

- A. Comply with ASTM A53.
- B. Schedule: 40.
- C. Fittings: Malleable iron Class 150, conforming to ASME B16.3, threaded in accordance with ASME B1.20.1.
- D. Coating and Lining: Hot-dip galvanized conforming to ASTM A153. Buried or contact surfaces of GSP through concrete shall be covered with polyethylene-backed butyl tape, 35 mils thick, applied with primer and lapping per tape manufacturer's recommendations.

2.3 BRASS PIPE AND FITTINGS

- A. Seamless Red Brass: Comply with ASTM B43.
- B. Schedule: 40.
- C. Fittings: Class 125, cast brass, threaded fittings, per ASME B16.15 and B1.20.1.

2.4 ACCESSORIES

- A. Unions:
 - 1. End connections
 - a. PVC: Slip.
 - b. GSP: Threaded.
 - 2. Material: As shown on Drawings.
- B. Right Angle Inspection Elbow:
 - 1. Material: Schedule 80 PVC.
 - 2. Connection Orientation: 90 degrees.
 - 3. Size: As indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before installation, each article shall be inspected, and any damaged material discarded. Damaged coatings shall be repaired per the manufacturer's written instructions.
- B. Verify that field dimensions are as indicated on Drawings.

3.2 PREPARATION

- A. Protect materials and equipment from damage and intrusion of water and other materials.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Pipe Cutting:
 - 1. The Contractor shall perform all work of cutting pipe and fittings or special castings necessary to the proper and accurate assembly, erection, and completion of the work. All pipe shall be cut to fit accurately without damaging the pipe or lining and so as to leave a smooth end at right angles to the axis of the pipe.
 - 2. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
 - 3. Use only equipment specifically designed for pipe cutting; use of chisels or hand saws is not permitted.
 - 4. Grind edges smooth with beveled end for push-on connections.
- D. Remove scale, dirt, and debris on inside and outside before assembly.
- E. Prepare pipe connections to equipment with flanges or unions.
- F. Pipe Threads: Pipe ends shall be reamed to the full bore of the pipe. Threads shall conform to ASNI B1.20.1. In making up threaded joints, an accepted thread lubricant shall be applied to the male threads only.

3.3 INSTALLATION

- A. Comply with ASME B31.3 Process Piping.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Use minimum number of joints.
- D. Field Fabrication of Fittings: According to manufacturer instructions.
- E. Provide thrust restraints on all pipe and fittings where a hydraulic thrust occurs.

- F. Flexible Couplings and Expansion Joints:
 - 1. At connections to equipment and where indicated on Drawings.
 - 2. As specified in Section 331413 – Public Water Utility Distribution Piping.
- G. Couplings, Service Saddles, and Anchors: According to manufacturer instructions.
- H. PVC pipe shall be assembled in accordance with AWWA C605 and the manufacturer's installation instructions.
- I. PVC Pipe 3-inch and Smaller:
 - 1. Wipe off all joints and surfaces with clean, dry rag.
 - 2. Apply primer to both the pipe and fitting, working the primer into the surface to soften the PVC pipe.
 - 3. While the primer is still wet, apply the solvent cement. Work the cement onto the pipe using a circular motion.
 - a. Apply a generous and even coat of solvent primer and cement.
 - b. Do not let the primer or cement puddle inside the fitting or run down inside the pipe.
 - 4. Assemble immediately. Push and twist (1/4 turn) socket/fitting onto pipe until it bottoms out.
 - 5. Hold pieces together until cement sets. Refer to manufacturer's recommendations for set and cure time schedules.
 - 6. Remove excess cement on outside of pipe.
 - 7. Fill with water and thoroughly flush before capping off or closing. If there is still a strong smell of solvents in the piping, vapors are being generated.
 - 8. Wait for joints to set before disturbing pipe. After cement has set, carefully assemble piping system in the final position.
 - a. Snake pipe to allow for thermal expansion/contraction.
 - 9. Avoid pressurization of system until adequately cured.
- J. All work shall conform to Drawing details and the manufacturer's recommendations.
- K. Handle all materials in a manner that will not damage the material or its coating.
- L. Handle, assemble, and install pipe and fittings in strict conformance with the manufacturer's recommendations and as indicated on Drawings.
- M. Maximum pipeline joint deflections and minimum curve radii shall conform with published tables prepared by the manufacturers. Fittings shall be placed at the vertical/horizontal angle points as shown on the Drawings unless otherwise approved by the Engineer. The Contractor shall install additional vertical angle fittings where required to maintain conformance with the manufacturer's published tables on maximum pipeline joint deflections and minimum curve radii. The Contractor may, at his option, install up to one additional coupling per 20-foot length of PVC pipe in lieu of an additional vertical fitting, provided that the installation is in compliance with the manufacturer's recommendations.

- N. Steel Rods, Bolts, Lugs, and Brackets: Coat buried steel before backfilling.
- O. Maintain 10 feet of horizontal separation between water main and sewer piping.
- P. Maintain 4 feet of horizontal separation between water main and storm drain and/or irrigation piping.
- Q. Maintain 1 foot of vertical separation between water main and sewer storm drain and/or irrigation crossings.
- R. Route pipe in straight line and re-lay pipe that is out of alignment or grade.
- S. High Points:
 - 1. Install pipe with no high points.
 - 2. If unforeseen field conditions arise that necessitate high points, install air-release valves as directed by Engineer.
- T. Bedding and Backfill: As specified in Section 312316.13 - Trenching.
- U. Bearing:
 - 1. Maintain bearing along entire length of pipe.
 - 2. Pipes shall be laid with the bell end ready to receive the next pipe. Bell holes shall be dug, and the trench bottom graded such that the pipe is supported along the barrel and not the bell.
 - 3. Do not lay pipe in wet or frozen trench.
- V. Allow for expansion and contraction without stressing pipe or joints.
- W. In addition to exercising extreme care to keep the inside of the pipe clear of dirt and debris during installation, the Contractor shall insert or place temporary watertight plugs over all ends of the pipe except during periods of continuous observation such as during pipeline installation.
- X. Install access fittings to permit pressure testing performed under this section and disinfection of water system performed under Section 330110.58 - Disinfection of Water Utility Piping Systems.
- Y. Cover:
 - 1. Establish elevations of buried piping with not less than 3 feet of cover.
 - 2. Measure depth of cover from final surface grade to top of pipe barrel.
- Z. Polyethylene (PE) Film Encasement:
 - 1. Encase all buried ductile-iron pipe, fittings, and valves in PE [**as indicated on Drawings**] to prevent contact with surrounding backfill material.
 - 2. Comply with AWWA C105.
 - 3. Terminate encasement 3 to 6 inches above ground where pipe is exposed.

AA. Tape Wrap:

1. All buried or concrete encased galvanized steel pipe shall be tape wrapped with 50% overlap.

BB. Disinfection of Potable Water Piping Systems: As specified in Section 330110.58 - Disinfection of Water Utility Piping Systems.

CC. Pipe Supports: As specified in Section 400507 - Hangers and Supports for Process Piping.

DD. Local Indicators:

1. Install direct-reading indicator devices such as thermometers and pressure gages as indicated on Drawings and according to manufacturer instructions.
2. Location: Capable of being read from floor level and accessible for maintenance.

EE. Orientate valves to permit operation and maintenance access to valve operator and to avoid interferences with other equipment.

3.4 FIELD QUALITY CONTROL

A. Inspection:

1. Inspect for damage to pipe lining or coating and for other defects that may be detrimental as determined by Engineer.
2. Repair damaged piping or provide new, undamaged pipe.
3. After installation, inspect for proper supports and interferences.

B. Pressure Testing:

1. Test Pressure: Not less than 50 psi in excess of maximum static pressure, whichever is greater.
2. Conduct hydrostatic test for at least two hours.
3. Fill section to be tested with water slowly; expel air from piping at high points. Install corporation cocks at high points. Close air vents and corporation cocks after air is expelled. Raise pressure to specified test pressure.
4. Observe joints, fittings, and valves under test. Remove and renew cracked pipe, joints, fittings, and valves showing visible leakage. Retest.
5. Correct visible deficiencies and continue testing at same test pressure for additional two hours to determine leakage rate. Maintain pressure within plus or minus 5 psi of test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
6. Compute maximum allowable leakage by following formula:
 - a. $L = SD \times \sqrt{P}/C$.
 - b. L = testing allowance, in gallons per hour.
 - c. S = length of pipe tested, in feet.
 - d. D = nominal diameter of pipe, in inches.
 - e. P = average test pressure during hydrostatic test, in psig.
 - f. C = 148,000.

SECTION 404213 - PROCESS PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Piping insulation.
2. Pipe insulation accessories.

B. Related Requirements:

1. Section 402319.01 – Process Piping.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. ASTM International:

1. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
2. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
3. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
4. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement.
5. ASTM C449 - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
6. ASTM C450 - Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging.
7. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation.
8. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
9. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
10. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
11. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
12. ASTM C585 - Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing.
13. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.

14. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
15. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
16. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
17. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
18. ASTM C1729 - Standard Specification for Aluminum Jacketing.
19. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120.
20. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
21. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

C. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP-69 - Pipe Hangers and Supports - Selection and Application.

1.4 PREINSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.5 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Product Data: Submit product description, thermal characteristics, list of materials, and thickness for each service and location.
- C. Manufacturer's Instructions: Submit manufacturer's published literature indicating recommended installation procedures.

1.6 QUALITY ASSURANCE

- A. Comply with ASTM C585 for inner and outer diameters of pipe insulation.
- B. Factory-fabricated fitting covers according to ASTM C450.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Accept materials on-Site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

- C. Inspection: Accept insulation on-Site in manufacturer's packaging. Inspect for damage.
- D. Store insulation according to manufacturer's instructions.
- E. Protect insulation from weather and construction traffic, dirt, water, chemicals, and damage by storing in original wrapping.

1.8 AMBIENT CONDITIONS

- A. Install insulation only when ambient temperature and humidity conditions are within ranges as recommended by manufacturer.
- B. Maintain recommended temperature and humidity before, during, and after installation as recommended by manufacturer.

1.9 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.10 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 PIPE INSULATION

- A. Manufacturers:
 - 1. K-FLEX USA:
 - a. Pipe: Insul-Lock DS.
 - b. Fittings: K-FIT.
 - 2. Armacell.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Type: Flexible closed-cell elastomeric.
 - 2. Comply with ASTM C534 Type 1, Grade 1.
 - 3. Pre-split with pressure sensitive adhesive (PSA) and overlap PSA closure system.
 - 4. UV-resistant rated for outdoor use.

5. Thermal Conductivity: 0.245 BTU-in/hr-FT² - °F @ 75° F.
6. Operating Temperature Range: -40° F to 220° F.
7. Thickness: 1½ -inch.
8. Fittings: Factory fabricated.

2.2 PIPE INSULATION ACCESSORIES

- A. Covering Adhesive Mastic: Compatible with insulation.
- B. Adhesives: Compatible with insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that piping and equipment has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION - PIPING SYSTEMS

- A. Piping Exposed to View in Finished Spaces: Locate insulation and cover seams in least visible locations.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Piping Systems Conveying Fluids Below Ambient Temperature:
 1. Insulate entire system, including fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
 2. Fittings, Joints, and Valves:
 - a. Insulate with molded insulation of like material and thickness as adjacent pipe.
- D. Inserts and Shields:
 1. Piping 1½-Inch Diameter and Smaller: Install galvanized- steel shield between pipe hanger and insulation.
 2. Piping 2-Inch Diameter and Larger:
 - a. Install insert between support shield and piping, and under finish jacket.
 - b. Insert Configuration: Minimum 6 inches long, of thickness and contour matching adjoining insulation; may be factory fabricated.
 - c. Insert Material: Compression-resistant insulating material suitable for planned temperature range and service.

E. Piping Exterior to Building:

1. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe.
2. Cover with adhesive mastic with seams located at 3- or 9-o'clock position on side of horizontal piping, with overlap facing down to shed water, or on bottom side of horizontal piping.

END OF SECTION 404213

SECTION 407313 - PRESSURE AND DIFFERENTIAL PRESSURE GAUGES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pressure gauges.
2. Snubbers.
3. Diaphragm seals.

B. Related Requirements:

1. Section 402319.01 – Process Piping.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

B. ASME International:

1. ASME B40.100 - Pressure Gauges and Gauge Attachments.

C. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

1.4 COORDINATION

A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 SUBMITTALS

A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Product Data: Submit manufacturer information for system materials and component equipment, including connection requirements.

C. Shop Drawings:

1. Indicate system materials and component equipment.
2. Submit installation requirements and other details.

1.6 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of equipment and accessories.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Extra Stock Materials:
 1. Gauges Other Than Diaphragm Protected: Furnish 20 percent spare gauges, with a minimum of one gauge for each range used.
 2. Diaphragm-Protected Gauges: Furnish 20 percent spare gauges, with a minimum of one gauge for each range used, complete with diaphragm seals.

1.8 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Ensure that materials of construction of wetted parts are compatible with process liquid.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.11 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 PRESSURE GAUGES

- A. Manufacturers:
 - 1. Ashcroft:
 - a. Pressure Gauge: Type 1009.
 - b. Snubber:
 - c. Diaphragm Seal: Type 301.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Type: Compound.
- C. Dials:
 - 1. Nominal Diameter: 3-½ inches.
 - 2. Face: White, laminated plastic dials with black graduations.
 - 3. Scale: Extend over arc not less than 270 degrees.
 - 4. Ranges and Graduation Units: As indicated on Drawings.
- D. Case:
 - 1. Dampening: Liquid filled, glycerin.
 - 2. Material: Type 304 stainless steel.
 - 3. Weather Resistance: Nema 4x.
 - 4. Window: Clear polycarbonate.
- E. Connection:
 - 1. Location: Lower.
 - 2. Socket:
 - a. ¼-inch NPT male thread.

- b. Material: Brass.
 - c. Provide wrench flats.
3. Mounting: As indicated on Drawings.
- F. Measuring Element:
- 1. Bourdon Tubes:
 - a. Material: Type 316L stainless steel.
 - 2. Movement:
 - a. Spring suspended construction designed to resist the effects of shock, pulsation, and vibration.
 - 3. Accuracy:
 - a. Comply with ASME B40.100.
 - b. Plus and minus 1 percent of full-scale range.
- G. Adjustment:
- 1. Provide for zero-reading adjustment.
 - 2. Adjusting Screws: Accessible from rear of case without need for disassembly.
- H. Accessories:
- 1. Pressure Snubber:
 - a. Material: Type 316 stainless steel.
 - b. Provide isolation valve.
 - 2. Shutoff Cocks: Furnished by gauge manufacturer.
 - 3. Diaphragm Seal:
 - a. Diaphragm seals and pressure gauges shall be provided as one unit calibrated by the manufacturer.
 - b. Material:
 - 1) Housings: Type 304L stainless steel.
 - 2) Diaphragm: Viton.
 - c. Instrument Connection: Direct, 1/4-inch NPT.
 - d. Process connection: Threaded female, 1/2-inch NPT.
 - e. Flush Port: Yes.
 - f. Maximum pressure/temp: 200 psi @ 74°F.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that items provided by other Sections of Work are ready to receive Work of this Section.

3.2 INSTALLATION

- A. According to manufacturer instructions.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Coordinate location and orientation of gauges and seal assemblies with final piping and equipment installations.
- D. Ensure that gauges are located to be easily read during operation and easily accessible for maintenance.
- E. Provide unions where required for removal of pressure gauges without removal of process piping.

3.3 FIELD QUALITY CONTROL

- A. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.

END OF SECTION 407313

SECTION 408000 - MISCELLANEOUS MECHANICAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hose bibbs - interior.
2. Hose bibb vacuum breaker.
3. Hose rack.
4. Freeze-proof yard hydrant.
5. Floor drain.
6. Backwater check valve.
7. Portable fire extinguisher.
8. Drench hose/eye wash station.
9. Mushroom-style vent cap.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
3. ASME B31.9 - Building Services Piping.
4. ASME B40.1 - Gauges - Pressure Indicating Dial Type - Elastic Element.

B. American Society of Sanitary Engineering:

1. ASSE 1011 - Performance Requirements for Hose Connection Vacuum Breakers.

C. ASTM International:

1. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. ASTM B32 - Standard Specification for Solder Metal.
3. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes.
4. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
5. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120.
6. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.

7. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
8. ASTM D2467 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
9. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
10. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
11. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
12. ASTM D3311 - Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns.
13. ASTM F1476 - Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications.

D. American Welding Society:

1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

E. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP 80 - Bronze Gate, Globe, Angle and Check Valves.
2. MSS SP 85 - Cast Iron Globe & Angle Valves, Flanged and Threaded.
3. MSS SP 110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

F. Plumbing and Drainage Institute:

1. PDI WH201 - Water Hammer Arrester Standard.

G. Underwriters Laboratories Inc.:

1. UL 393 - Indicating Pressure Gauges for Fire-Protection Service.
2. UL 404 - Gauges, Indicating Pressure, for Compressed Gas Service.

1.4 SUBMITTALS

A. Certifications as required to comply with American Iron and Steel (AIS) provisions.

B. Refer to the Standard General Conditions and Supplementary Conditions.

C. Product Data:

1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturer's catalog information.
2. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
3. Domestic Water Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.

- D. Manufacturer's Installation Instructions: Submit installation instructions for pumps, valves, and accessories.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations of valves and equipment.
- C. Operation and Maintenance Data: Submit spare parts list, exploded assembly views, and recommended maintenance intervals.

1.6 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
 - 1. According to Section 116875 of the California Health and Safety Code, “lead free” means not more than 0.2 percent lead when used with respect to solder and flux and not more than a weighted average of 0.25 percent when used with respect to the wetted surfaces of pipes and pipe fittings, plumbing fittings, and fixtures.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Perform Work according to AWWA standards.
- E. For drinking water service, provide valves and appurtenances complying with NSF 61.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.8 PRE-INSTALLATION MEETINGS

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES and Standard General Conditions – Preconstruction Conference.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Accept valves and equipment on site in shipping containers with labeling in place. Inspect for damage.
- C. Provide temporary protective coating on cast iron and steel valves.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.10 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.11 WARRANTY

- A. Refer to the Standard General Conditions and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 HOSE BIBBS - INTERIOR

- A. Manufacturers:
 - 1. Arrowhead Brass.
 - 2. Nibco.
 - 3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Type: Multi-turn, angle.
 - 2. NSF 372 certified.
 - 3. Pressure Rating: 125 PSI.
 - 4. Inlet Connection: $\frac{3}{4}$ -inch NPT.
 - 5. Outlet Connection: $\frac{3}{4}$ -inch male hose thread.

2.2 HOSE BIBB VACUUM BREAKER

A. Manufacturers:

1. Arrowhead Brass PK1400.
2. Watts.
3. Zurn.
4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Type: Self draining.
2. NSF 372 certified.
3. Pressure Rating: 125 PSI.
4. Inlet Connection: $\frac{3}{4}$ -inch female hose thread.

2.3 HOSE RACK

A. Manufacturers:

1. Dixon DHR1.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. One piece manufactured from cast aluminum.
2. $19\frac{1}{2}$ -inch length x $9\frac{3}{16}$ -inch height.

2.4 FREEZE-PROOF YARD HYDRANT

A. Manufacturers:

1. Woodford Model Y1.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Shall have an adjustable link for lever lock tension.
2. Shall have a rod guide, adjustable flow setpoint, and lever lock.
3. Graphite packing for lubrication.
4. Hydrant shall have a one-piece variable flow plunger with an automatic drain feature.
5. Hydrant shall be rated for a minimum working pressure of 125 PSI.

2.5 FLOOR DRAIN

A. Manufacturers:

1. Jones Stephens.
2. Zurn.
3. Watts.
4. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
5. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Shall be round cast iron with nickel bronze strainer.
2. Shall be PVC with full plastic grate and ring in chlorine room.

2.6 BACKWATER CHECK VALVE

A. Manufacturers:

1. Clean Check, Inc.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Material: 3x6-inch PVC tee-shaped cleanout valve body, 6-inch PVC riser, 3-inch PVC upper collar, stainless steel set screw, and a replaceable PVC flap disc.

2.7 PORTABLE FIRE EXTINGUISHER

A. Manufacturers:

1. Amerex Model B441.
2. Badger Model B10M.
3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Capacity: Ten pounds.
2. Chemical: Dry.
3. Fire Class: A, B, and C.
4. UL Rating: 4A:80B:C.
5. Accessories:
 - a. Wall mounting bracket.
 - b. Aluminum sign that identifies the fire extinguisher location, ULINE S-14801A, or equal.
 - c. Locking pin.
 - d. Hose and nozzle.

2.8 DRENCH HOSE/EYE WASH STATION

A. Manufacturers:

1. Guardian G5026.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Wall mounted with powder-coated wall bracket.
2. Hand-held eyewash/drench hose:
 - a. Squeeze handle with plastic cover.
 - b. Eight feet of PVC hose.
3. Internal flow control and filter.
4. Two GS-plus spray heads, mounted side-by-side with “flip top” dust covers.
5. Forged brass squeeze valve.
6. Storage is vertical position and valve is actuated open when handle is depressed.
 - a. Locking clip engages when handle is depressed. Valve stays open until locking clip is released.
7. Shall include ANSI compliant identification sign.

2.9 MUSHROOM-STYLE VENT CAP

A. Manufacturers:

1. Christy's.
2. Northtown Company.
3. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
4. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Vandal-resistant and mushroom-style.
2. Materials: Galvanized steel with No. 30 stainless steel mesh screens.
3. Connections: As indicated on Drawings.
4. Size: As indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before installation, each article shall be inspected, and any damaged material discarded or returned to the supplier. Any damaged coating shall be repaired per the manufacturers written instructions.

3.2 PREPARATION

- A. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- C. Remove scale and dirt, on inside and outside, before assembly.

3.3 INSTALLATION

- A. According to applicable referenced standards and as shown on the Drawings.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Fire extinguishers shall be installed at height which places the carry handle at 42 inches above the floor. All fire extinguishers shall be installed with a sign 6 feet above the floor identifying the location of the extinguisher.

END OF SECTION 408000

SECTION 432310 - MUNICIPAL WATER PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Multistage submersible pumps.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 DEFINITIONS

- A. Equipment: Pump, motor, and all accessories pertinent to the operation of the pump.

1.4 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

- B. Hydraulic Institute.

- C. American Bearing Manufacturers Association:

1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

- D. American Iron and Steel Institute:

1. AISI 1045 - Medium Carbon Steel.

- E. ASME International:

1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.

- F. ASTM International:

1. ASTM A27/A27M - Standard Specification for Steel Castings, Carbon, for General Application.
2. ASTM A29/A29M - Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought.
3. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
4. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes.
5. ASTM A536 - Standard Specification for Ductile Iron Castings.

6. ASTM B91 - Standard Specification for Magnesium-Alloy Forgings.
7. ASTM B505/B505M - Standard Specification for Copper Alloy Continuous Castings.

G. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

1.5 SUBMITTALS

A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Product Data: Submit manufacturer information including the following:

1. Description of equipment and accessories.
2. Performance and design criteria.
3. Performance curves with specified operating points plotted.
 - a. Variable frequency drive pump curve shall be continuously rising and shall be free from dips and valleys from the design point to the shutoff head.
 - b. The shutoff head shall be at least 115% of the head that occurs at the design point.
4. Electrical characteristics and connection requirements.
5. Installation instructions.
6. Natural frequency analysis.
7. Factory test results.

C. Shop Drawings:

1. Furnish diagrams showing complete layout of system, including equipment, piping, valves, wiring and ladder diagrams, controls, and control sequences.
2. Indicate size and configuration of assembly, mountings, weights, and accessory connections.
3. Indicate manufacturer's specified displacement tolerances for vibration at operational speed as specified for pumps.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures, anchoring, and layout.

F. Source Quality-Control Submittals: Indicate results of factory tests and inspections.

G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

H. Manufacturer Reports: Certify that equipment has been installed according to manufacturer instructions.

I. Qualifications Statements:

1. Submit qualifications for manufacturer and installer.
2. Submit manufacturer's approval of installer.

1.6 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Refer to Engineer’s Supplementary Conditions – EQUIPMENT INFORMATION.
- C. Project Record Documents: Record actual locations and final orientation of pumps and appurtenances.

1.7 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.

1.8 QUALIFICATIONS

- A. Pump Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 25 years' documented experience.
 1. Pump manufacturer shall be certified to ISO 9001 standard for design and manufacture of vertical turbine pumps.
- B. Installer: Company specializing in performing Work of this Section with minimum ten years' documented experience and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.

D. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.10 WARRANTY

A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Equipment shall be warranted for manufacturer defects for two years from the date the unit is placed into service and accepted by the Owner as operating within the specifications.

C. Minor warranty repairs of the pumps and motors shall be done on-site while major repairs shall be done at the factory authorized service center.

1. The manufacturer shall determine in consultation with the Owner if the repair is minor or major.
2. The manufacturer warranty shall include all parts necessary to repair the equipment, labor and shipping costs to and from the service center.
3. The Owner will remove and replace the equipment.

D. The equipment manufacturer's service representative shall perform an on-site service and maintenance inspection between the 11th and 12th month after pump acceptance as scheduled by the Owner.

1. During the 11-month inspection the manufacturer's service representative shall replace the consumables (i.e., wear ring, seals, lubricant, etc.) as recommended by the manufacturer's recommended maintenance schedule in the presence of the Owner.
2. Consumables shall be supplied by the manufacturer.

E. A written service report shall be provided by the manufacturer to the Owner after the 11-month inspection including applicable measurements of equipment conditions, such as capacity (flow at given total dynamic head conditions), amperage, voltage, repairs, and recommendations for immediate repairs.

1. The Owner's service log shall be reviewed, and recommendations shall be offered by the manufacturer's service representative regarding the level of service to date.
2. The equipment manufacturer's service representative shall retrain the Owner's operators in the operation and maintenance of the equipment.

F. All costs for travel, labor, consumables, and parts during the 11-month service and maintenance inspection shall be the responsibility of the manufacturer.

G. Equipment manufacturer shall have in place an authorized service center with fully trained service staff capable of performing all warranty and maintenance work located within a 350-mile radius of Lewiston, California.

1. The pump manufacturer shall be capable of providing a full line of replacement parts and service on-site within 48 hours of a service call.

PART 2 - PRODUCTS

2.1 MULTISTAGE SUBMERSIBLE PUMPS

A. Manufacturers:

1. Grundfos.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Location: Well 8.
2. Type: Multi-stage submersible design with the motor mounted directly to the bottom of the pump suitable for pumping raw water from a wet well. The pump shall be furnished as specified herein and as shown on the Plans and installed in accordance with the recommendations of the manufacturer.
3. Configuration: Direct-connected.
4. Pump shall be equipped with a check valve immediately above the pump and motor.
5. The pump shall be capable of delivering the flows at the required design conditions summarized below.

C. Performance and Design Criteria:

1. Design Flow (gpm): 20.
2. Design TDH (ft): 254.
3. Rated Speed (RPM): 10,700.
4. Efficiency @ Design Point (%): 60.
5. Pump Discharge (inch): 1.5.
6. Fluid: Water.
7. Pump Model: 22 SQ15-220.

D. Impeller:

1. Material: Composite.
2. Attachment: Keyed to shaft.

E. Shaft Material: [**Stainless**] [**Corrosion-resistant alloy**] steel.F. Column Material: [**Stainless**] [**Corrosion-resistant alloy**] steel.

G. Motors:

1. Continuous duty, non-overloading at any point on the pump head capacity curve.
2. HP: 2.5.
3. Volts: 240.
4. Phase: 1.
5. Speed (RPM): 10,700.
6. Diameter (inch): 3.
7. Service Factor: 1.15.

2.2 OPERATION

- A. Refer to electrical Drawings.

2.3 FABRICATION

- A. Connect pump shaft to drive motor with coupling specified.
- B. Shaft Guard: Enclose shaft and universal joint with enclosed-type metal shaft guard complying with OSHA standards.
- C. Pump and Drive Mating Surfaces: Machine finished.

2.4 DROP PIPE

- A. Manufacturers:
 - 1. Cresline-West, Inc.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Type: PVC, Schedule 120.
 - 2. Joints: Threaded.
 - 3. Comply with ASTM D1785.
 - 4. Couplings: Steel.

2.5 WELL SEAL

- A. Manufacturers:
 - 1. Simmons Manufacturing Company.
 - 2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
 - 3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.
- B. Description:
 - 1. Class 25 non-toxic, lead-free painted cast iron.
 - 2. Solid top plate.
 - 3. Zinc-plated steel bolts.
 - 4. $\frac{3}{4}$ -inch molded rubber.
 - 5. Well Size ID: 4 inches.
 - 6. Drop Pipe Size: 1.5 inches.
 - 7. Cable Hole Tapping: 1-inch.
 - 8. Vent Tapping: $\frac{1}{2}$ -inch.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. According to manufacturer instructions.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

3.2 FIELD QUALITY CONTROL

- A. Inspection:
 - 1. Ensure that pumps have been installed correctly and that there is no objectionable heat or vibration.
 - 2. Check pump and motor alignment, proper motor rotation, and pump and drive units for proper lubrication.
- B. Testing:
 - 1. Operate pump on clear water at design point for continuous period of two hours, under supervision of manufacturer's representative and in presence of Engineer.
 - 2. The equipment shall be field tested in the presence of the Engineer who will determine based on gauge readings, amperage readings, and flow measurements, whether the units are operating in conformance with the Specifications. Any evidence of equipment misalignment, noisy operation, or other signs of improper setting shall be corrected by the Contractor and/or qualified service representative prior to acceptance by the Owner.
- C. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than one day on Site for installation, inspection, startup, field testing, and instructing Owner's personnel in operation and maintenance of equipment.
- D. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.
- E. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

3.3 ADJUSTING

- A. Check control functions and adjust as required.
- B. Provide vibration analysis testing.

3.4 DEMONSTRATION

- A. Demonstrate equipment startup, shutdown, routine maintenance, alarm condition responses, and emergency repair procedures to Owner's personnel.

END OF SECTION 432310

SECTION 463344 - CHEMICAL DAY TANKS, METERING PUMPS, AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Peristaltic-type metering pump.
2. Tubing.
3. Day tank and stand.
4. Injection quill.
5. Secondary containment system.

B. Related Requirements:

1. Section 253100 - Control Panels and Accessories.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 012100 - Measurement and Payment.

1.3 REFERENCE STANDARDS

- A. Refer to Engineer's Supplementary Conditions – REFERENCE SPECIFICATIONS.

1.4 COORDINATION

- A. Refer to the Standard General Conditions and Supplementary Conditions.

1.5 SEQUENCING

- A. Refer to Engineer's Supplementary Conditions – SEQUENCE OF WORK AND INTERRUPTION OF EXISTING FACILITIES.

1.6 SUBMITTALS

- A. Refer to the Standard General Conditions and Supplementary Conditions.

B. Product Data:

1. Submit electrical characteristics and connection requirements.
2. Submit manufacturer model number, dimensions, service sizes, and finishes.

- C. Manufacturer's Instructions:
 - 1. Submit detailed instructions on installation requirements, including storage and handling procedures, anchoring, and layout.
- D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.7 CLOSEOUT SUBMITTALS

- A. Refer to Standard General Conditions – Record Documents.
- B. Project Record Documents: Record actual locations and final orientation of equipment and accessories.
- C. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.

1.8 QUALITY ASSURANCE

- A. All pipe, fittings, valves, devices, appurtenances, solder, flux, lubrication, plumbing fitting, or plumbing fixture intended to convey, dispense, or treat water for human consumption shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.
- B. Any material or product used in production, treatment, or distribution of water intended for human consumption shall be certified as meeting the specifications of NSF International 61.
- C. No chemical or product shall be added to water intended for human consumption unless certified as meeting the specifications of NSF International 60.
- D. Ensure that materials of construction on pump liquid end are compatible with sodium hypochlorite.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Refer to the Standard General Conditions and Supplementary Conditions.
- B. Inspection: Accept pumps on-Site in manufacturer's original packaging and inspect for damage.
- C. Storage:
 - 1. Store products in areas protected from weather, moisture, or possible damage.
 - 2. Do not store products directly on ground.
- D. Handle products to prevent damage to interior or exterior surfaces.

PART 2 - PRODUCTS

2.1 PERISTALTIC-TYPE METERING PUMPS

A. Manufacturers to meet Owner's existing standardized chlorine dosing equipment:

1. Blue-White Industries, Flex-Flo ModelA-100NF-4T-X.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Type: Positive displacement, peristaltic type tubing pump.
2. Flow Range: 0.01 to 0.1 gph.
3. Maximum Working Pressure: 100 psi.
4. Pump Head:
 - a. PBT thermoplastic.
 - b. Integral tube failure detection system.
 - 1) Location: Pump head.
 - 2) Tube failure detection system shall not trigger with water contact.
 - 3) Float switch type switches alone shall not be used.
 - 4) Process fluid waste ports or leak drains alone shall not be provided as the sole means of protection.
 - c. Roller Assembly:
 - 1) Rotor: Valox 420 SEO.
 - 2) Squeeze rollers directly coupled to a one-piece rotor.
 - 3) Type: Three nylon rollers located 120 degrees apart.
 - 4) The roller diameters and occlusion gap shall be factory set to provide the optimum tubing compression; field adjustment shall not be required.
 - 5) Spring-loaded or hinged rollers shall not be used.
 - 6) Installed on a D-shaped, chrome-plated motor shaft and removable without tools.
 - 7) For tubing installation and removal, rotor assembly shall be rotated by the motor drive. Hand cranking of the rotor assembly shall not be required.
5. Pump Head Cover:
 - a. Clear thermoplastic with an integral bearing fitted to support the overhung load on the motor shaft.
 - b. Removable.
 - c. Positively secured to the pump head using three thumb screws. Tools shall not be required to remove the pump head cover.

6. Pump Tube Assembly:
 - a. Provided by the manufacturer.
 - b. Assembled to connection fittings of PVDF material.
 - c. Connection Fittings: Permanently clamped to the tubing with stainless steel clamps. To prevent tubing misalignment and ensure accuracy, fittings shall insert into keyed slots located in the pump head and secured in place by the pump head cover. Fittings shall not rotate when installed.
 - d. Size: Accept ¼-inch ID x ⅜-inch OD flexible tubing.
 - e. Material: Flex-A-Prene.

7. Drive System:
 - a. Factory installed.
 - b. Power: 115VAC 60 Hz.
 - c. Motor:
 - 1) Brushless DC gear.
 - 2) Rating: Continuous duty.
 - 3) Include overload protection.
 - 4) Maximum Gear Motor: 14 RPM.
 - 5) Variable speed motor adjustable from 10% to 100% in 1% increments.

 - d. Enclosure:
 - 1) Material: Injection-molded Valox 420 SEO.
 - 2) Rated: NEMA 3R.
 - 3) Mounting Brackets and Hardware: 316SS floor/shelf level mounting brackets and hardware.
 - 4) Provide with four slots in the enclosure base for shelf mounting and two slots in the rear panel for wall mounting.
 - 5) Front panel uses dial knob for speed adjustment and power on/off switch.
 - a) Dial knob capable of adjusting pump speed from 10% to 100%.
 - 6) To prevent tampering, the front dial knob and power switch shall be wholly enclosed by a clear, acrylic door secured with two side clamps.

2.2 TUBING

A. Manufacturers:

1. Saint-Gobain, Chemfluor.
2. Freelin-Wade.
3. Hudson Extrusions.
4. Parker.
5. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
6. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Fluorinated Ethylene Propylene (FEP) Tubing:

1. Type: Fluoropolymer.
2. Durometer Hardness, Shore D: 55.
3. Working Pressure: 250 psi at 75° F.
4. Outside Diameter (OD): $\frac{3}{8}$ -inch.
5. Minimum Inside Diameter (ID): $\frac{1}{4}$ -inch.
6. Color: Transparent.
7. Certifications: NSF 61.

C. Accessories:

1. Tubing Union Connector:
 - a. Rating: 125 PSI.
 - b. PFA Fluoropolymer.
 - c. Ideal for corrosive environments.
 - d. Size: As indicated on Drawings.

2.3 DAY TANK

A. Manufacturers:

1. Snyder Industries.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Type: Total drain.
2. Top: Open, removable lid.
3. Volume, Gallon: 30.
4. Graduation Marks: Yes.
5. Color: Translucent.
6. Containment: Yes.
7. Vent: Sized to limit pressure or vacuum in the tank to $\frac{1}{2}$ -inch of water column. Provide insect screen.
8. Material: High density linear polyethylene (HDLPE).
9. Fittings: Threaded PVC bulkhead fill and drain fittings with Viton gaskets.

2.4 INJECTION QUILL

A. Manufacturers:

1. Koflo QP-5-3-K.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Type: Standard service chemical injection quill.
2. Insertion Length: 3 inches.
3. Tip Configuration: 45° bevel.
4. Pressure Rating: 150 psi.
5. Check Valve: Integrated spring-loaded ball check valve.
6. Valve/Process Connection Size: 1-inch NPT.
7. Inlet Connection Size: ½-inch NPT.
8. Solution Tube Size: ½-inch NPT.

C. Materials:

1. Valve: CPVC.
2. Solution Tube: PVC.
3. Check Valve Seal: KALREZ 6375.

D. Wall Shelf

1. Manufacturer:
 - a. CAMSHELVING PREMIUM
 - b. Or equal: Refer to the Standard General Condition and Supplementary Conditions.
 - c. Substitution: Refer to the Standard General Condition and Supplementary Conditions.
2. Description:
 - a. Type: Wall Shelf.
 - b. Material: Polypropylene.
 - c. Shelf Style: Solid.
 - d. Load Capacity: 150 lbs.
 - e. Mounting mechanism: Direct.

2.5 SECONDARY CONTAINMENT SYSTEM**A. Manufacturers:**

1. Ultratech International, Inc.
2. Or equal: Refer to the Standard General Conditions and Supplementary Conditions.
3. Substitutions: Refer to the Standard General Conditions and Supplementary Conditions.

B. Description:

1. Type: Spill deck with bladder.
2. Sump Capacity: 66 gallons.
3. Low profile.
4. Grating: Polyethylene.

5. Bladder automatically deploys if large spill occurs.
6. Meets Spill Prevention, Control, and Countermeasure (SPCC) and EPA Container Storage Regulations.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount pump shelf to wall as indicated on Drawings.
- B. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- C. Fasten pump to mounting shelf with stainless-steel bolts.
- D. Install power and control and wiring as specified in Section 260519 - Low-Voltage Electrical Power Conductors and Cables.
- E. Flush tubing with clean water.
- F. Pipe and Fittings: As specified in Section 402319.01 - Process Piping

3.2 FIELD QUALITY CONTROL

- A. Pre-operational Check: Before operating system or components, vent air from system to ensure water in pump.
- B. Startup and Performance Testing:
 1. Test metering pump flow rate by measuring time to fill or by draining calibration column with potable water.
 2. Operate each chemical feed system on clear water for continuous period of four hours.
 3. Hydrostatically test system piping for leaks at 100 psig.
- C. Equipment Acceptance:
 1. Adjust, repair, modify, or replace components failing to perform as specified, and rerun tests.
 2. Make final adjustments to equipment under direction of manufacturer's representative.

END OF SECTION 463344