



Red Bluff, California

BIDDING REQUIREMENTS
AND
CONTRACT DOCUMENTS

for purchase of

PUMPS, MOTORS, AND BUTTERFLY VALVES
RED BLUFF PUMPING PLANT IMPROVEMENTS

JACOBS

Redding, CA

September 2026

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Project No. PW\JA WATER-001\D3317602

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TEHAMA-COLUSA CANAL AUTHORITY
RED BLUFF PUMPING PLANT IMPROVEMENTS

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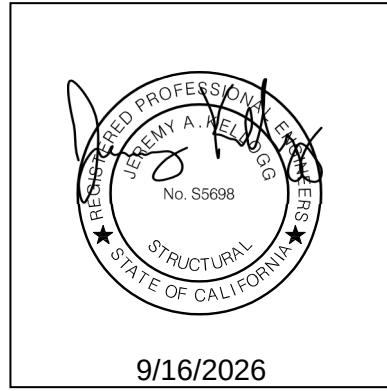


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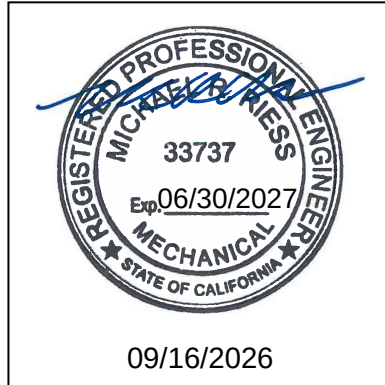


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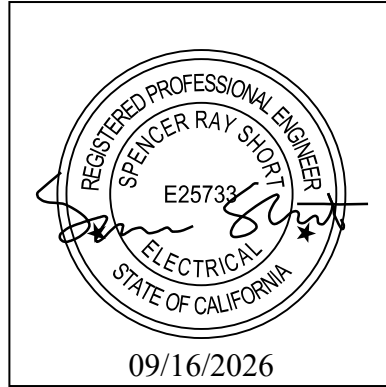


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Spencer Short

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PART 1

BIDDING REQUIREMENTS

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INVITATION TO BID

Electronic Bids for the purchase of Pumps, Motors, and Butterfly Valves for the Tehama-Colusa Canal Authority (Buyer), will be received until 3:00 p.m., local time, on October 8, 2026. Bid proposals shall be submitted via e-mail to ldicharry@tccanal.com, attention Tehama-Colusa Canal Authority. Bids will be accepted electronically only and will not be accepted in person. E-mail submissions shall not exceed 20 MB in size. Immediately following the Bid closing, the Bid proposals will be read aloud at the Buyer's office, 5513 Highway 162, Willows, CA 95988. An abstract of the Bids received will subsequently be posted on the Buyer's website. Any Bids received after the specified time will not be considered.

A prebid conference will NOT be held. Project Site walk-throughs may be provided by appointment only for prospective Bidders. For an appointment to visit the Site, contact Aaron Hall, Tehama-Colusa Canal Authority, telephone: (530) 529-0124, e-mail: ahall@tccanal.com.

The Project contemplated consists of the installation of Pumps, Motors, and Butterfly Valves for Units 2 and 10 of the Red Bluff Pumping Plant in Red Bluff, CA. Goods and Special Services to be furnished and delivered under this Contract are a part of the Project and consist of the following:

1. Two medium-voltage induction motors.
2. Two butterfly valves and actuator assemblies.
3. Two vertical axial-flow pumps and miscellaneous components.
4. Spare parts and special tools.
5. Special services.

Seller shall be responsible to coordinate with the Buyer for delivery of the Goods as early as November 22, 2027.

Bidding Documents are available on the Buyer's website: <https://tccanal.com/tcca-contracts>

Each Bid must be submitted on the prescribed Bid Form and accompanied by Bid security as prescribed in the Instructions to Bidders, payable to the Buyer in an amount not less than 10 percent of the amount Bid.

The Successful Bidder will be required to furnish the additional bond(s) and insurance prescribed in Bidding Documents.

For information concerning the proposed Project, contact Brad Memeo, Jacobs Engineering Group Inc., e-mail: brad.memeo@jacobs.com, telephone: (530) 229-3430.

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Buyer's right is reserved to reject all Bids or any Bid not conforming to the intent and purpose of the Bidding Documents.

Dated this 16 day of September, 2026.

Tehama-Colusa Canal Authority

By 

William Vanderwaal, PE, General Manager

END OF SECTION

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS.

1.1. Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof:

1.1.1. *Bidder* – The individual or entity who submits a Bid directly to Buyer.

1.1.2. *Buyer* – The Tehama-Colusa Canal Authority. The individual or entity purchasing the Goods and Special Services.

1.1.3. *Contractor* – the individual or entity with whom the Buyer enters into a contract for the performance of the Construction Work related to the Project.

1.1.4. *Construction Work* – the labor, services, materials, equipment, and activities required for the construction of the Project, as performed by the Contractor pursuant to a contract awarded through the Project bidding process.

1.1.5. *Issuing Office* – the office from which the Bidding Documents are to be issued and where the Bidding procedures are to be administered.

1.1.6. *Seller* – The individual or entity furnishing the Goods and Special Services.

2. BIDS RECEIVED.

2.1. Refer to Invitation to Bid for information on receipt of Bids.

3. COPIES OF BIDDING DOCUMENTS.

3.1. A complete set of Bidding Documents is available on Buyer's website:
<https://tccanal.com/tcca-contracts/>.

3.2. Complete sets of Bidding Documents shall be used in preparing Bids; neither Buyer nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.3. Buyer and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for furnishing Goods and Special Services and do not confer a license or grant for any other use.

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4. QUALIFICATIONS OF BIDDERS.

4.1. To demonstrate Bidder's qualifications to furnish Goods and Special Services, Bidder shall submit written evidence, such as financial data, previous experience, and other such data as may be called for below.

4.1.1. Furnish a list of projects similar in scope, complexity, and magnitude to the work required under this solicitation that has been completed by the Bidder within the last 15 years for the design and manufacture of large diameter vertical axial-flow pumping systems of equal or larger capacity as specified. Clearly demonstrate Bidder's ability to successfully accomplish projects in a timely manner, utilize resources and work with project owners. Provide the following information for each project:

4.1.1.1. Name of Project.

4.1.1.2. Description of the goods and special services.

4.1.1.3. Initial contract amount and final contract amount.

4.1.1.4. Any problems encountered in performance of the work and corrective action(s) taken.

4.1.1.5. Name(s), telephone number(s), and email addresses of references from the acquiring customer who may be contacted for further information.

4.1.2. Manufacturing Facilities:

4.1.2.1. Provide information identifying the specific manufacturing facilities proposed for the manufacture of equipment to be furnished under this Contract. Demonstrate the manufacturer's proven quality, production capabilities, and quality control procedures for equipment manufactured for installation in the United States. Equipment shall comply with all applicable United States standards, including ANSI, NEMA, IEEE, ASTM, and other standards referenced in Sections 26 19 00, Medium-Voltage Induction Motors, 40 27 02, Process Valves and Actuators, and 44 42 56.23, Vertical Axial-Flow Pumps, of the Specifications.

4.1.2.2. Provide information on quality control procedures at Bidder's facilities. Demonstrate that the quality control program and procedures for the proposed facilities comply with ISO-9001 certification requirements.

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4.1.3. Provide a detailed project schedule consisting of a minimum of thirty (30) discrete tasks that identifies all major activities and milestones. The schedule shall include, at a minimum, approval data submittals, equipment manufacturing, shop testing, final data submittals, shipping, and delivery of the equipment and associated components. The schedule shall clearly identify the anticipated start and completion dates for each activity and demonstrate compliance with the Contract Times specified in the Agreement.

4.2. Bidder is advised to carefully review those portions of Bid Form requiring Bidder's representations and certifications.

5. EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND POINT OF DESTINATION.

5.1. Upon request, Buyer will provide Bidder access to the Point of Destination and the site where Goods are to be installed or Special Services are to be provided so that Bidder may conduct such investigations, examinations, tests, and studies as Bidder deems necessary for submission of a Bid.

5.2. It is the responsibility of each Bidder, before submitting a Bid, to:

5.2.1. Examine and carefully study Bidding Documents, including Addenda and related data identified in Bidding Documents.

5.2.2. If specified or, if in Bidder's judgment, any local condition may affect cost, progress, or furnishing of Goods and Special Services, visit the Point of Destination and the site where the Goods are to be installed and Special Services are to be provided to become familiar with local conditions.

5.2.3. Become familiar with and satisfy itself as to Laws and Regulations that may affect cost, progress, or furnishing of Goods and Special Services.

5.2.4. Carefully study, consider, and correlate information known to Bidder; information commonly known to Sellers of similar Goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods are to be installed or Special Services are to be provided; and any reports and drawings identified in the Bidding Documents regarding Point of Destination and site where Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under Contract Documents;

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5.2.5. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder.

5.2.6. Determine that Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

6. PREBID CONFERENCE.

6.1. A Prebid Conference will NOT be held. Project Site walk-throughs may be provided by appointment only for prospective Bidders. For an appointment to visit the Site, contact Aaron Hall, Tehama-Colusa Canal Authority, e-mail: ahall@tccanal.com, telephone: (530) 529-0124. Oral statements may not be relied upon and will not be binding or legally effective.

7. INTERPRETATIONS AND ADDENDA.

7.1. All questions about the meaning or intent of Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda to all parties recorded by Issuing Office as having received Bidding Documents. Questions received less than 7 days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral statements and other interpretations may not be relied upon and will not be binding or legally effective.

7.2. Addenda may be issued to clarify, correct, or change Bidding Documents as deemed advisable by Buyer or Engineer.

8. BID SECURITY.

8.1. Bid must be accompanied by Bid security made payable to Buyer, in an amount of 10 percent of Bidder's maximum Bid price and in the form of a certified or bank check or a Bid Bond on form attached, issued by a surety meeting requirements of paragraph 4.01.B of the General Conditions.

8.2. The Bid security of the apparent Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished required contract security, and met other conditions of the Notice of Award, whereupon Bid security will be returned. If apparent Successful Bidder fails to execute and deliver the Contract Documents and furnish required contract security within 15 days after the Notice of Award, Buyer may consider Bidder to be in default, annul the Notice of Award, and Bid security of that Bidder will be forfeited. The Bid security of other Bidders that Buyer believes to have a reasonable chance of receiving award may be retained by

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Buyer until the earlier of 7 days after Effective Date of the Agreement or 61 days after Bid opening whereupon Bid security furnished by such Bidders will be returned.

8.3. Bid security of other Bidders that Buyer believes do not have a reasonable chance of receiving the award will be returned within 7 days after Bid opening.

9. CONTRACT TIMES.

9.1. See applicable provisions in the Agreement.

10. LIQUIDATED DAMAGES.

10.1. Provisions for liquidated damages such as those for Seller's failure to attain a Milestone, or to deliver the Goods or furnish Special Services within the Contract Times, are set forth in the Agreement.

11. "OR-EQUAL" ITEMS.

11.1. The Contract, if awarded, will be on the basis of materials and equipment specified or described in Bidding Documents without consideration of possible "or-equal" items. Whenever it is specified or described in Bidding Documents that an "or-equal" item of material or equipment may be furnished or used by Seller if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after Effective Date of the Agreement. The procedure for submittal of such application by Seller and consideration by Engineer is set forth in the General Conditions and may be supplemented in the General Requirements.

12. PREPARATION OF BID.

12.1. The Bid Form is included with Bidding Documents. Additional copies may be obtained from Issuing Office.

12.2. All blanks on Bid Form shall be completed and the Bid Form signed. Alterations shall be initialed by the person signing the Bid Form. A Bid price shall be indicated for each Bid item listed therein, or the words "No Bid", "No Change", or "Not Applicable" entered.

12.3. A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

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

12.5. A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state in which the firm was formed, and the official address of the firm shall be shown below the signature.

12.6. A Bid by an individual shall show the Bidder's name and official address.

12.7. A Bid by a joint venture shall be executed by each joint venture partner in the manner indicated on the Bid Form. The official address of the joint venture shall be shown below the signature.

12.8. All names must be typed or printed below the signatures.

12.9. The Bid shall contain an acknowledgment of receipt of all Addenda; the numbers of which shall be filled in on the Bid Form. Failure to acknowledge receipt will cause Bid to be considered in nonconformance.

12.10. Each Bidder shall list the postal address, e-mail address, and telephone number for communications regarding the Bid.

13. BASIS OF BID; COMPARISON OF BIDS.

13.1. Lump Sum:

13.1.1. Bidder shall submit Bid on a lump sum basis as set forth in Bid Form.

13.1.2. Bids will be compared on the basis of the lump sum.

14. SUBMISSION OF BID.

14.1. The Bid Form is to be completed and submitted with the Bid Security and other required documents listed in the Bid Form.

14.2. Bid shall be submitted electronically via e-mail no later than the date and time prescribed in the Invitation to Bid.

15. MODIFICATION OR WITHDRAWAL OF BID.

15.1. A Bid may be modified or 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.

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

16. OPENING OF BIDS.

16.1. Bids will be opened at the time and place indicated in Invitation to Bid and, unless obviously nonresponsive, read aloud publicly. An abstract of the amounts of the Base Bids will be made available to Bidders after opening of Bids.

17. BIDS TO REMAIN SUBJECT TO ACCEPTANCE.

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

18. BASIS OF AWARD; AWARD OF CONTRACT.

18.1. Buyer reserves its right to reject any and all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Buyer further reserves the right to reject the Bid of any Bidder that Buyer finds, after reasonable inquiry and evaluation, to be nonresponsive. Buyer may also reject the Bid of any Bidder if Buyer believes that it would not be in the best interest of the Project to make an award to that Bidder.

18.2. More than one Bid for the same Goods and Special Services from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for Goods and Special Services shall be cause for disqualification of that Bidder and rejection of all Bids in which that Bidder has an interest.

18.3. In evaluating Bids, Buyer will consider whether or not Bids comply with prescribed requirements, and such alternatives, unit prices and other data, as may be requested in Bid Form prior to a Notice of Award.

18.4. Buyer may conduct such investigations as Buyer deems necessary to establish responsibility, qualifications, and financial ability of Bidder.

18.5. If Contract is to be awarded, Buyer will award Contract to Bidder whose Bid, in the sole discretion of the Buyer, is in the best interest of Project.

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19. CONTRACT SECURITY AND INSURANCE.

19.1. Article 4 of the General Conditions and Article 4 of Supplementary Conditions set forth Buyer's requirements as to furnishing a supply contract bond and insurance. When Successful Bidder delivers executed Agreement to Buyer, it must be accompanied by the required bond.

20. SIGNING OF AGREEMENT.

20.1. When Buyer issues a Notice of Award to Successful Bidder, it shall be accompanied by required number of unsigned counterparts of Agreement with the other Contract Documents that are to be identified in Agreement and attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver required number of counterparts of Agreement and attached documents to Buyer. Within 10 days thereafter, Buyer shall deliver one fully signed counterpart to Successful Bidder with a complete set of Drawings with appropriate identification.

21. RETAINAGE.

21.1. Provisions concerning Seller's rights to deposit securities in lieu of retainage are set forth in Agreement.

22. REGULATIONS, LAWS, AND RULES

22.1. The Project is being funded in whole or in part by the United States Bureau of Reclamation (Reclamation). Bidder shall cooperate with Buyer to respond to any reasonable requests by funding agencies within the scope of the agreements entered between the Reclamation and the Buyer for use of funds for the Project including providing data, information, or reports.

22.2. The Project is subject to Build America, Buy America (BABA) requirements.

END OF SECTION

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BID FORM

1. BID RECIPIENT.

1.1. This Bid is submitted to:

Buyer: Tehama-Colusa Canal Authority

Address: 5513 Highway 162, Willows, CA 95988

Project: Red Bluff Pumping Plant Improvements

1.2. Undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with Buyer in the form included in Bidding Documents to furnish Goods and Special Services as specified or indicated in Bidding Documents for the prices and within the times indicated in this Bid and in accordance with other terms and conditions of Bidding Documents.

2. BIDDER'S ACKNOWLEDGEMENTS.

2.1. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with disposition of Bid security. Bid will remain subject to acceptance for 60 days after Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Buyer.

3. BIDDER'S REPRESENTATIONS.

3.1. In submitting this Bid, Bidder represents that:

3.1.1. Bidder has examined and carefully studied Bidding Documents, related data identified in Bidding Documents, and the following Addenda, receipt of all of which is hereby acknowledged.

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

3.1.2. Bidder has become familiar with and is satisfied as to the observable local conditions, where the Goods are to be installed or Special Services will be provided, that may affect cost, progress, or furnishing of Goods and Special Services if required to do so by Bidding Documents, or if, in Bidder's

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judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.

3.1.3. Bidder is familiar with and is satisfied as to Laws and Regulations in effect as of the date of the Bid that may affect cost, progress, and furnishing of Goods and Special Services.

3.1.4. Bidder has carefully studied and correlated information known to Bidder; information commonly known to Sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods will be installed or Special Services will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under Bidding Documents.

3.1.5. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in Bidding Documents, and written resolution thereof by Engineer is acceptable to Bidder.

3.1.6. Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services for which this Bid is submitted.

4. BIDDER'S CERTIFICATIONS

4.1. Bidder certifies that:

4.1.1. 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;

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

4.1.3. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

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4.1.4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.1.4:

4.1.4.1. “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;

4.1.4.2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Buyer, (b) to establish Bid prices at artificial noncompetitive levels, or (c) to deprive Buyer of the benefits of free and open competition;

4.1.4.3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish Bid prices at artificial, noncompetitive levels; and

4.1.4.4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process.

4.1.5. Required sales and use taxes are included in the stated Bid prices for the materials and equipment to be incorporated in the Project unless provision is made herein for the Bidder to separately itemize the estimated amount of sales tax or if Instruction to Bidders state Owner is tax exempt.

4.1.6. In accordance with California Public Contract Code 6101, Bidder has not been convicted of violating a state or federal law respecting the employment of undocumented aliens in preceding 5 years.

5. BASIS OF BID.

5.1. Lump Sum Price:

5.1.1. Bidder will furnish the Goods and Special Services in accordance with the Contract Documents for the following price(s) which include all taxes:

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Item No. ^[a]	Item Description	Lump Sum Bid Price
1.	Two (2) Medium-Voltage Induction Motors as specified in Section 26 19 00, Medium-Voltage Induction Motors, complete with all appurtenances, spare parts, and special tools, delivered to the Point of Destination.	\$
2.	Two (2) Butterfly Valve and Actuator Assemblies as specified in Section 40 27 02, Process Valves and Actuators, complete with all appurtenances, spare parts, and special tools, delivered to the Point of Destination.	\$
3.	Two (2) Vertical Axial-Flow Pumps as specified in Section 44 42 56.23, Vertical Axial-Flow Pumps, complete with all appurtenances, spare parts, and special tools, delivered to the Point of Destination.	\$
4.	Special services as specified in Section 01 43 34, Special Services, for Medium-Voltage Induction Motors.	\$
5.	Special services as specified in Section 01 43 34, Special Services, for Butterfly Valves and Actuator Assemblies.	\$
6.	Special services as specified in Section 01 43 34, Special Services, for Vertical Axial-Flow Pumps.	\$
	^[a] Other requirements of these Bidding Documents shall be provided as incidental to or included in Items No. 1 through No. 6, allocated as Bidder shall determine. These requirements include, but are not limited to, submittals, documentation, installation instructions, operation and maintenance information, factory testing, and administration.	N/A
	Base Bid (Total of Above)	\$

6. TIME OF COMPLETION.

6.1. Bidder agrees that furnishing of Goods and Special Services will conform to the Contract Times set forth in the Agreement.

6.2. Bidder accepts the provisions of the Agreement as to liquidated damages.

7. ATTACHMENTS TO THIS BID.

7.1. The following documents are attached to and made a condition of this Bid:

7.1.1. Completed Bid Form.

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RED BLUFF PUMPING PLANT IMPROVEMENTS

7.1.2. List of Proposed Major Suppliers of Goods.

7.1.3. Bidder Qualifications Form with supporting data.

7.1.4. Affidavit of Non-Collusion.

7.1.5. Build America, Buy America (BABA) Initial Certification Statement.

7.1.6. Completed Bid Bond Form.

8. DEFINED TERMS.

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

9. BID SUBMISSION.

9.1. This Bid submitted by:

An Individual

Name (*typed or printed*): _____

By (*signature*): _____

Doing Business As: _____

Business Address: _____

Phone No.: _____ Facsimile: _____

E-mail Address: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(*Signature of general partner – attach evidence of authority to sign*)

Name (*typed or printed*): _____

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Business Address: _____

Phone No.: _____ Facsimile: _____

E-mail Address: _____

A Corporation

Corporation Name: _____

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____ (CORPORATE SEAL)

Attest: _____
(Signature of Corporate Secretary)

Business Address: _____

Phone No.: _____ Facsimile: _____

E-mail Address: _____

A Limited Liability Company (LLC)

LLC Name: _____

State in Which Organized: _____

By: _____
(Signature – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

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Business Address: _____

Phone No.: _____ Facsimile: _____

E-mail Address: _____

A Joint Venture

First Joint Venture Name: _____ (SEAL)

By: _____
(Signature of joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone No.: _____ Facsimile: _____

E-mail Address: _____

Second Joint Venture Name: _____ (SEAL)

By: _____
(Signature of joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone No.: _____ Facsimile: _____

E-mail Address: _____

END OF SECTION

TEHAMA-COLUSA CANAL AUTHORITY
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LIST OF PROPOSED MAJOR SUPPLIERS OF GOODS

List below each major Supplier who meet the conditions described in Section 00 21 14, Instructions to Bidders. For each Supplier, list name, address, license number, and a description of the type or kind of work the Supplier will perform.

	SUPPLIER <u>NAME AND ADDRESS</u>	<u>SPECIALTY</u>	<u>LICENSE NO.</u>
1.			
2.			
3.			

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	SUPPLIER <u>NAME AND ADDRESS</u>	<u>SPECIALTY</u>	<u>LICENSE NO.</u>
4.			
5.			
6.			
7.			

BIDDER QUALIFICATIONS FORM

PART I – BIDDER

Name and Business Address:

Contact Person: _____

PART II – PAST PERFORMANCE

Furnish a list of projects similar in scope, complexity, and magnitude to the work required under this solicitation that has been completed by the Bidder within the last 15 years for the design and manufacture of large diameter vertical axial-flow pumping systems of equal or larger capacity as specified. Clearly demonstrate Bidder's ability to successfully accomplish projects in a timely manner, utilize resources and work with project owners. Provide the following information for each project:

- A. Name of Project.
- B. Description of the goods and special services.
- C. Initial contract amount and final contract amount.
- D. Any problems encountered in performance of the work and corrective action(s) taken.
- E. Name(s), telephone number(s), and email addresses of references from the acquiring customer who may be contacted for further information.

Manufacturing Facilities:

- A. Provide information identifying the specific manufacturing facilities proposed for the manufacture of equipment to be furnished under this Contract. Demonstrate the manufacturer's proven quality, production capabilities, and quality control procedures for equipment manufactured for installation in the United States. Equipment shall comply with all applicable United States standards, including ANSI, NEMA, IEEE, ASTM, and other standards referenced in Sections 26 19 00, Medium-Voltage Induction Motors, 40 27 02, Process Valves and Actuators, and 44 42 56.23, Vertical Axial-Flow Pumps, of the Specifications.
- B. Provide information on quality control procedures at Bidder's facilities. Demonstrate that the quality control program and procedures for the proposed facilities comply with ISO-9001 certification requirements.

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Provide a detailed project schedule consisting of a minimum of thirty (30) discrete tasks that identifies all major activities and milestones. The schedule shall include, at a minimum, approval data submittals, equipment manufacturing, shop testing, final data submittals, shipping, and delivery of the equipment and associated components. The schedule shall clearly identify the anticipated start and completion dates for each activity and demonstrate compliance with the Contract Times specified in the Agreement.

TEHAMA-COLUSA CANAL AUTHORITY
RED BLUFF PUMPING PLANT IMPROVEMENTS

AFFIDAVIT OF NON-COLLUSION

STATE OF _____)
) §
County of _____)

_____, being first duly sworn, deposes and says: THAT
Print Name

he/she is _____ of
Print Title (Owner/Officer/Agent/President/Vice President)

(Print Name of Company)

who submits herewith to the TEHAMA-COLUSA CANAL AUTHORITY, a bid proposal called
Pumps, Motors, and Butterfly Valves.

THAT all statements of fact in such bid proposal are true;

THAT said proposal was not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation;

THAT said bid proposal is genuine and not collusive or a sham;

THAT said bidder has not, directly or indirectly by agreement, communication or conference with anyone, attempted to induce action prejudicial to the interest of the TEHAMA-COLUSA CANAL AUTHORITY or of any bidder or anyone else interested in the proposed Contract; and further,

THAT prior to the public opening and reading of proposal, said bidder:

1. did not directly or indirectly induce or solicit anyone else to submit a false or sham bid proposal;
2. did not directly or indirectly collude, conspire, connive or agree with anyone else that said bidder or anyone else would submit a false or sham proposal, or that anyone should refrain from bidding or withdraw his/her proposal;
3. did not, in any manner, directly or indirectly seek, by agreement, communication or conference with anyone, to raise or fix the proposal price of said bidder or of anyone else, or to raise or fix any overhead, profit, or cost element of his proposal price or of that of anyone else;

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4. did not directly or indirectly submit his proposed price or any breakdown thereof, or the contents thereof, or divulge information or data relative thereto to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any individual or group of individuals, except the TEHAMA-COLUSA CANAL AUTHORITY, or to any person or persons who have a partnership or other financial interests with said bidder in his/her business.

BY: _____
Signature

STATE OF CALIFORNIA)
) §
County of _____)

The foregoing instrument was subscribed and sworn to before me this

_____ day of _____, 2026.

NOTARY PUBLIC

My Commission Expires:

TEHAMA-COLUSA CANAL AUTHORITY
RED BLUFF PUMPING PLANT IMPROVEMENTS

BUILD AMERICA, BUY AMERICA (BABA) INITIAL CERTIFICATION STATEMENT

Upon execution of this certification, the selected Contractor, Seller, Subcontractor, Materials Supplier, or Service Provider hereby certifies that all of the iron, steel, manufactured products, and construction materials used in the Project are produced in the United States or appropriate waiver(s) has been approved by the U.S. Bureau of Reclamation.

This statement relates to a proposed contract between _____
(Seller)

and Tehama-Colusa Canal Authority _____ or between
(Buyer)

_____ and _____
(subcontractor) (Seller)

in conjunction with Red Bluff Pumping Plant Improvements

to be funded with monies from a federal assistance agreement.

Signature Date

Name and Title of Signer (Please type)

TEHAMA-COLUSA CANAL AUTHORITY
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SECTION 00 43 14
BID BOND
(PENAL SUM FORM)

BIDDER
(Name and Address):

SURETY
(Name and Address of Principal Place of Business):

BUYER (Name and Address):

Tehama-Colusa Canal Authority
5513 Highway 162, Willows, CA 95988

BOND:

Bond Number: _____
Penal Sum: _____
Date: _____
(Not later than Bid due date)

BID

Bid Due Date: _____

Project (Brief Description Including Location):

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

Bidder's Name and Corporate Seal (Seal)

By: _____
Signature and Title

Attest: _____
Signature and Title

SURETY

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, Buyer or other party shall be considered plural where applicable.

PW\JA WATER-001\D3317602
SEPTEMBER 15, 2026
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BID BOND (PENAL SUM FORM)
00 43 14 ATTACHMENT - 1

**TEHAMA-COLUSA CANAL AUTHORITY
RED BLUFF PUMPING PLANT IMPROVEMENTS**

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Buyer upon default of Bidder the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Buyer) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1. Buyer accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Buyer) 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 Buyer, or
 - 3.3. Buyer 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 Buyer 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 by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Buyer, 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 the Buyer and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall 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 Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall 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 Registered or Certified Mail, return receipt requested, postage prepaid, and shall 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 shall 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 shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

PART 2

CONTRACTING REQUIREMENTS

TEHAMA-COLUSA CANAL AUTHORITY
RED BLUFF PUMPING PLANT IMPROVEMENTS

AGREEMENT

THIS AGREEMENT is between Tehama-Colusa Canal Authority (“Buyer”) and _____ (“Seller”).

Buyer and Seller, hereby agree as follows:

1. GOODS AND SPECIAL SERVICES.

1.1. Seller shall furnish Goods and Special Services as specified or indicated in the Contract Documents.

2. THE PROJECT.

2.1. The Project for which Goods and Special Services may be the whole or only a part of is generally described as follows: Red Bluff Pumping Plant Improvements.

3. ENGINEER.

3.1. The Contract Documents for the Goods and Special Services have been prepared by Jacobs Engineering Group Inc., which is to act as Buyer’s representative, assume all duties and responsibilities, and have rights and authority assigned to Engineer in the Contract Documents in connection with Seller’s furnishing of Goods and Special Services.

4. POINT OF DESTINATION.

4.1. The Point of Destination is designated as: 22500 Altube Ave., Red Bluff, CA 96080.

5. CONTRACT TIMES.

5.1. Time of the Essence:

5.1.1. All time limits for Milestones, if any, including submittal of Shop Drawings and Samples, delivery of Goods, and furnishing of Special Services as stated in the Contract Documents are the essence of the Contract.

5.2. Milestones:

5.2.1. Date for Submittal of Shop Drawings and Samples: Seller shall submit Shop Drawings and Samples required by the Contract Documents to Buyer for Engineer’s review and approval within 30 days after date when Contract.

TEHAMA-COLUSA CANAL AUTHORITY
RED BLUFF PUMPING PLANT IMPROVEMENTS

Times commence to run as provided in Paragraph 2.04 of the General Conditions. It is the intent of the parties that:

5.2.2. Engineer conduct such review and issue its approval, or a denial accompanied by substantive comments regarding information needed to gain approval, within 20 days of Seller's submittal of such Shop Drawings and Samples.

5.2.3. Date for Delivery of Goods: Deliver Goods to the Point of Destination and ready for Buyer's receipt shall be coordinated with the construction contractor and Buyer. Seller shall not deliver Goods without prior written authorization from the Buyer. Delivery of Goods shall be within 52 weeks from receipt of approved Shop Drawings.

5.2.4. Days for Furnishing Special Services: The furnishing of Special Services to Buyer will commence within 45 days after Buyer's acknowledgement of receipt of delivery of Goods and shall be completed within 30 days thereafter.

5.3. Buyer's Final Inspection:

5.3.1. Buyer shall make its final inspection of the Goods pursuant to Paragraph 8.01.C of the General Conditions within 5 days after Buyer's acknowledgement of receipt of delivery of the Goods and Seller's completion of furnishing Special Services, if any. Date shall be adjusted equitably if Seller fails to deliver the Goods or furnish Special Services in compliance with the Milestones established in above paragraphs of this Agreement.

5.4. Liquidated Damages: Buyer and Seller recognize that Buyer will suffer financial loss if Goods are not delivered at the Point of Destination and ready for receipt of delivery by Buyer within times specified in Paragraph Date for Delivery of Goods herein, plus any extensions thereof allowed in accordance with Article 7 of the General Conditions. The parties also recognize timely performance of services by others involved in the Project are materially dependent upon Seller's specific compliance with requirements specified in Date for Delivery of Goods. Further, they recognize the delays, expense, and difficulties involved in proving actual loss suffered by Buyer if complete acceptable Goods are not delivered on time.

5.4.1. Accordingly, instead of requiring such proof, Buyer and Seller agree that as liquidated damages for delay (but not as a penalty) Seller shall pay Buyer the following amounts for each day that expires after the time specified in Paragraph Date for Delivery of Goods.

5.4.1.1. For the first 15 days of delay, liquidated damages shall be assessed at \$1,600 per day.

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5.4.1.2. For delay days 16 through 30, liquidated damages shall be assessed at \$2,500 per day.

5.4.1.3. For delay days 31 and thereafter, liquidated damages shall be assessed at \$8,800 per day.

6. CONTRACT PRICE.

6.1. Buyer shall pay Seller for furnishing Goods and Special Services in accordance with the Contract Documents in current funds as follows:

6.1.1. A Lump Sum of \$_____

7. PAYMENT PROCEDURES.

7.1. Submission and Processing of Payments: Seller shall submit Applications for Payment in accordance with Article 10 of the General Conditions. Applications for Payment will be processed by Engineer in accordance with the General Conditions.

7.2. Progress Payments: Buyer shall make progress payments on account of Contract Price on the basis of Seller's Application for Payment as follows:

7.2.1.1. Upon receipt of first Application for Payment submitted in accordance with Paragraph 10.01.A.1 of the General Conditions and accompanied by Engineer's recommendation of payment in accordance with Paragraph 10.02.A of the General Conditions, an amount equal to 50 percent of the Contract Price, less such amounts as Engineer may determine in accordance with Paragraph 10.02.A.3 of the General Conditions.

7.2.1.2. Upon receipt of second such Application for Payment accompanied by Engineer's recommendation of payment in accordance with Paragraph 10.01.A.2 of the General Conditions, an amount sufficient to increase total payments to Seller to 75 percent of the Contract Price, less such amounts as Engineer may determine in accordance with Paragraph 10.02.A.3 of the General Conditions.

7.3. Final Payment: Upon receipt of the final Application for Payment accompanied by Engineer's recommendation of payment Buyer shall pay Seller amount recommended by Engineer less sum Buyer is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages.

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8. INTEREST.

8.1. All monies not paid when due as provided in Article 10 of the General Conditions shall bear interest at the rate of ten percent (10%) per annum.

9. SELLER'S REPRESENTATIONS.

9.1. In order to induce Buyer to enter into this Agreement, Seller makes the following representations:

9.1.1. Seller has examined and carefully studied the Contract Documents and other related data identified in Bidding Documents, as applicable to Seller's obligations to furnish Goods and Special Services.

9.1.2. If required by Bidding Documents to visit Point of Destination and site where the Goods are to be installed or Special Services will be provided, or if in Seller's judgment, any local condition may affect cost, progress or furnishing of Goods and Special Services, Seller has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is satisfied as to observable local conditions that may affect cost, progress, or furnishing of Goods and Special Services.

9.1.3. Seller is familiar with and is satisfied as to Laws and Regulations that may affect cost, progress, and furnishing of Goods and Special Services.

9.1.4. Seller has carefully studied, considered, and correlated information known to Seller; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Seller's visits, if any, to the Point of Destination and site where the Goods are to be installed or Services will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Contract Documents.

9.1.5. Seller has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Seller has discovered in the Contract Documents, and written resolution thereof by Engineer is acceptable to Seller.

9.1.6. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

TEHAMA-COLUSA CANAL AUTHORITY
RED BLUFF PUMPING PLANT IMPROVEMENTS

10. CONTRACT DOCUMENTS.

10.1. Contents: The Contract Documents consist of the following:

10.1.1. This Agreement (pages 1 to 7, inclusive);

10.1.2. Supply Contract Bond (pages 1 to 4, inclusive);

10.1.3. General Conditions (pages 1 to 21, inclusive);

10.1.4. Supplementary Conditions (pages 1 to 8, inclusive);

10.1.5. Specifications as listed in Table of Contents of the Project Manual dated September 2026;

10.1.6. Addenda (Numbers ____ to ____, inclusive);

10.1.7. Exhibits to this Agreement (enumerated as follows):

10.1.7.1. Seller's Bid (pages ____ to ____, inclusive);

10.1.8. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

10.1.8.1. Notice to Proceed (pages ____ to ____, inclusive);

10.1.8.2. Change Order(s);

10.1.8.3. Work Change Directive(s);

10.2. The documents listed in above are attached to this Agreement (except as expressly noted otherwise above).

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

10.4. The Contract Documents may only be amended or supplemented as provided in Paragraph 3.04 of the General Conditions.

11. MISCELLANEOUS.

11.1. Defined Terms: Terms used in this Agreement will have the meanings indicated in the General Conditions and the Supplementary Conditions.

TEHAMA-COLUSA CANAL AUTHORITY
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11.2. Successors and Assigns: Buyer and Seller each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

11.3. Severability: Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Buyer and Seller. The Contract Documents shall 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.

11.4. Assignment of Contract: No assignment by a party hereto of any rights under or interests in the Contract shall be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, monies that may become due and monies that are 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 shall release or discharge the assignor from any duty or responsibility under the Contract Documents.

11.5. Seller's Certifications: Seller 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:

11.5.1. "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;

11.5.2. "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 Buyer, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition;

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

11.5.4. "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.

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IN WITNESS WHEREOF, Buyer and Seller have signed this Agreement. Counterparts have been delivered to Buyer and Seller. All portions of the Contract Documents have been signed or identified by Buyer and Seller or on their behalf.

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

Buyer: Tehama-Colusa Canal Authority

Seller: _____

By: _____
(Corporate Seal)

By: _____
(Corporate Seal)

Attest: _____

Attest: _____

Address for giving notice:

Address for giving notice:

(If Buyer is a corporation, attach evidence of authority to sign. If Buyer is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of Buyer-Seller Agreement.)

Agent for service of process:

Designated Representative:

(If Seller is a corporation or a partnership, attach evidence of authority to sign.)

Name: _____

Designated Representative:

Title: _____

Name: _____

Address: _____

Title: _____

Phone: _____

Address: _____

Facsimile: _____

Phone: _____

Facsimile: _____

END OF SECTION

TEHAMA-COLUSA CANAL AUTHORITY
RED BLUFF PUMPING PLANT IMPROVEMENTS

**SECTION 00 61 14.13
SUPPLY CONTRACT BOND**

Any singular reference to Seller, surety, Buyer or other party shall be considered plural where applicable.

SELLER
(Name and Address):

SURETY
(Name and Address of Principal Place of Business):

BUYER (Name and Address):

Tehama-Colusa Canal Authority

5513 Highway 162, Willows, CA 95988

BOND

Amount: _____

Date: _____

CONTRACT

Date: _____

Amount: _____

Description (Name and Location): _____

Modifications to this Bond Form:

Surety and Seller, intending to be legally bound hereby, subject to the terms printed on the last page hereof, do each cause this Supply Contract Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

SELLER AS PRINCIPAL

SURETY

Company Name and Corporate Seal

Company Name and Corporate Seal

Signature

Signature

Name and Title

Name and Title (Attach Power of Attorney)

Address

Telephone

**TEHAMA-COLUSA CANAL AUTHORITY
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(Space is provided below for signatures of additional parties, if required.)

SELLER AS PRINCIPAL

SURETY

Company Name and Corporate Seal

Company Name and Corporate Seal

Signature

Signature

Name and Title

Name and Title (Attach Power of Attorney)

Address

Telephone

TEHAMA-COLUSA CANAL AUTHORITY

RED BLUFF PUMPING PLANT IMPROVEMENTS

1. Seller and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Buyer for the performance of the Contract, which is incorporated herein by reference. For purposes of this bond, Buyer means Buyer's assigns if, and when Buyer has assigned the Contract.

2. If Seller performs the Contract, Surety and Seller have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.

3. If there is no Buyer Default, Surety's obligation under this Bond shall arise after:

3.1. Buyer has notified Seller and Surety pursuant to paragraph 10 that Buyer is considering declaring a Seller Default and has requested and attempted to arrange a conference with Seller and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. (If Buyer, Seller and Surety agree, Seller shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Buyer's right, if any, to subsequently declare a Seller Default); and

3.2. Buyer has declared a Seller Default and formally terminated Seller's right to complete the Contract. Such Seller Default shall not be declared earlier than 20 days after Seller and Surety have received notice as provided in paragraph 3.1; and

3.3. Buyer has agreed to pay the Balance of the Contract Price to:

1. Surety in accordance with the terms of the Contract;
2. Another seller selected pursuant to paragraph 4.3 to perform the Contract.

4. When Buyer has satisfied the conditions of paragraph 3, Surety shall promptly, and at Surety's expense, take one of the following actions:

4.1. Arrange for Seller, with consent of Buyer, to perform and complete the Contract; or

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

4.3. Obtain bids or negotiated proposals from qualified sellers acceptable to Buyer for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Buyer and Seller selected with Buyer's concurrence, to be secured with a supply bond executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to Buyer the amount of damages as described in paragraph 6 in excess of the Balance of the Contract Price incurred by Buyer resulting from Seller Default; or

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

1. determine the amount for which it may be liable to Buyer and, as soon as practicable after the amount is determined, tender payment therefor to Buyer; or
2. deny liability in whole or in part and notify Buyer citing reasons therefor.

5. If Surety does not proceed as provided in paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Buyer to Surety demanding that Surety perform its obligations under this Bond, and Buyer shall be entitled to enforce any remedy available to Buyer. If Surety proceeds as provided in paragraph 4.4, and Buyer

refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Buyer shall be entitled to enforce any remedy available to Buyer.

6. After Buyer has terminated Seller's right to complete the Contract, and if Surety elects to act under paragraph 4.1, 4.2, or 4.3, then the responsibilities of Surety to Buyer shall not be greater than those of Seller under the Contract, and the responsibilities of Buyer to Surety shall not be greater than those of Buyer under the Contract. To a limit of the amount of this Bond, but subject to commitment by Buyer of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

6.1. The responsibilities of Seller for correction or replacement of defective Goods and Special Services and completion of the Contract;

6.2. Additional legal, design professional and delay costs resulting from Seller's Default, and resulting from the actions or failure to act of Surety under paragraph 4; and

6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Seller.

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

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

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Goods and Services are located and shall be instituted within two years after Seller Default or within two years after Seller ceased working or within two years after 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 period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to Surety, Buyer or Seller shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Goods were to be delivered and the Special Services were to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1. Balance of the Contract Price: The total amount payable by Buyer to Seller under the Contract after all proper adjustments have been made, including allowance to Seller of any amounts received or to be received by Buyer in settlement of insurance or other Claims for damages to which Seller is entitled, reduced by all valid and proper payments made to or on behalf of Seller under the Contract.

12.2. Contract: The agreement between Buyer and Seller identified on the signature page, including all Contract Documents and changes thereto.

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12.3. Seller Default: Failure of Seller, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. Buyer Default: Failure of Buyer, which has neither been remedied nor waived, to pay Seller as required by the Contract or to perform and complete or comply with the other terms thereof.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS FOR PROCUREMENT CONTRACTS

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STANDARD GENERAL CONDITIONS FOR PROCUREMENT CONTRACTS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Whenever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to the singular or plural thereof. 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 signed by both Buyer and Seller covering the Goods and Special Services and which lists the Contract Documents in existence on the Effective Date of the Agreement.
3. *Application for Payment*—The form acceptable to Buyer which is used by Seller in requesting progress and final payments and which is accompanied by such supporting documentation as is required by the Contract Documents.
4. *Bid*—The offer or proposal of a Seller submitted on the prescribed form setting forth the prices for the Goods and Special Services to be provided.
5. *Bidder*—The individual or entity that submits a Bid directly to Buyer.
6. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and Bid Form with any supplements.
8. *Buyer*—The individual or entity purchasing the Goods and Special Services.
9. *Change Order*—A document which is signed by Seller and Buyer and authorizes an addition, deletion, or revision to the Contract Documents or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement. Change Orders may be the result of mutual agreement by Buyer and Seller, or of resolution of a Claim.
10. *Claim*—A demand or assertion by Buyer or Seller seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
11. *Contract*—The entire and integrated written agreement between Buyer and Seller concerning the Goods and Special Services. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
12. *Contract Documents*—Those items so designated in the Agreement. Shop Drawings and other Seller submittals are not Contract Documents, even if accepted, reviewed, or approved by Engineer or Buyer.
13. *Contract Price*—The moneys payable by Buyer to Seller for furnishing the Goods and Special Services in accordance with the Contract Documents as stated in the Agreement.
14. *Contract Times*—The times stated in the Agreement by which the Goods must be delivered and Special Services must be furnished.
15. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Goods and Special Services to be furnished by

- Seller. Shop Drawings and other Seller submittals are not Drawings as so defined.
16. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
17. *Engineer*—The individual or entity designated as such in the Agreement.
18. *Field Order*—A written order issued by Engineer which requires minor changes in the Goods or Special Services but which does not involve a change in the Contract Price or Contract Times.
19. *General Requirements*—Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
20. *Goods*—The tangible and movable personal property that is described in the Contract Documents, regardless of whether the property is to be later attached to realty.
21. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, including Goods, as defined herein, and Special Services, if any, as defined herein. This term refers to both the Goods and the Special Services, or to either the Goods or the Special Services, and to any portion of the Goods or the Special Services, as the context requires.
22. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
23. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to the Contract Times.
24. *Notice of Award*—The written notice by Buyer to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Buyer will sign and deliver the Agreement.
25. *Notice to Proceed*—A written notice given by Buyer to Seller fixing the date on which the Contract Times commence to run and on which Seller shall start to perform under the Contract.
26. *Point of Destination*—The specific address of the location where delivery of the Goods shall be made, as stated in the Agreement.
27. *Project*—The total undertaking of which the Goods and Special Services may be the whole, or only a part.
28. *Project Manual*—The documentary information prepared for bidding and furnishing the Goods and Special Services. A listing of the contents of the Project Manual is contained in its table of contents.
29. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Goods and Special Services and which establish the standards by which such portion of the Goods and Special Services will be judged.
30. *Seller*—The individual or entity furnishing the Goods and Special Services.
31. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Seller and submitted by Seller to illustrate some portion of the Goods and Special Services.
32. *Special Services*—Services associated with the Goods to be furnished by Seller as required by the Contract Documents.
33. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the furnishing of the Goods and Special Services, and certain

administrative requirements and procedural matters applicable thereto.

34. *Successful Bidder*—The Bidder submitting a responsive Bid, to whom Buyer makes an award.
35. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
36. *Work Change Directive*—A written statement to Seller issued on or after the Effective Date of the Agreement and signed by Buyer ordering an addition, deletion, or other revision in the Contract Documents with respect to the Goods and Special Services. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The words and terms discussed in Paragraphs 1.02.B and 1.02.C are NOT defined, but have the indicated meanings when used in the Bidding Requirements or Contract Documents.

B. *Intent of Certain Terms or Adjectives:*

1. 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 Goods and Special Services. It is intended that such exercise of professional judgment, action, or determination will be commercially reasonable and will be solely to evaluate, in general, the Goods and Special Services for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed

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 shall not be effective to assign to Engineer any duty or authority to supervise or direct the furnishing of Goods or Special Services or any duty or authority to undertake responsibility contrary to any other provision of the Contract Documents.

2. The word “non-conforming” when modifying the words “Goods and Special Services,” “Goods,” or “Special Services,” refers to Goods and Special Services that fail to conform to the Contract Documents.
3. The word “receipt” when referring to the Goods, shall mean the physical taking and possession by the Buyer under the conditions specified in Paragraph 8.01.B.3.
4. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
5. The word “furnish,” when used in connection with the Goods and Special Services shall mean to supply and deliver said Goods to the Point of Destination (or some other specified location) and to perform said Special Services fully, all in accordance with the Contract Documents.

C. 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 Bonds*

- A. When Seller delivers the executed counterparts of the Agreement to Buyer, Seller also shall deliver such bonds as Seller may be required to furnish.

2.02 *Evidence of Insurance*

- A. When Seller delivers the executed counterparts of the Agreement to Buyer, Seller shall deliver to Buyer, with copies to each additional insured

identified by name in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Seller is required to purchase and maintain in accordance with Article 4.

2.03 *Copies of Documents*

- A. Buyer shall furnish Seller up to five printed or hard copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.04 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement 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 Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.05 *Designated Representatives*

- A. Buyer and Seller shall each designate its representative at the time the Agreement is signed. Each representative shall have full authority to act on behalf of and make binding decisions in any matter arising out of or relating to the Contract.

2.06 *Progress Schedule*

- A. Within 15 days after the Contract Times start to run, Seller shall submit to Buyer and Engineer an acceptable progress schedule of activities, including at a minimum, Shop Drawing and Sample submittals, tests, and deliveries as required by the Contract Documents. No progress payment will be made to Seller until an acceptable schedule is submitted to Buyer and Engineer.
- B. The progress schedule will be acceptable to Buyer and Engineer if it provides an orderly progression of the submittals, tests, and deliveries to completion within the specified Milestones and the Contract Times. Such acceptance will not impose on Buyer or Engineer responsibility for the progress schedule, for sequencing, scheduling, or progress of the work nor interfere with or relieve Seller from Seller's full responsibility therefor.

Such acceptance shall not be deemed to acknowledge the reasonableness and attainability of the schedule.

2.07 *Preliminary Conference*

- A. Within 20 days after the Contract Times start to run, a conference attended by Seller, Buyer, Engineer and others as appropriate will be held to establish a working understanding among the parties as to the Goods and Special Services and to discuss the schedule referred to in Paragraph 2.06.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.08 *Safety*

- A. Buyer and Seller 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. When Seller's personnel, or the personnel of any subcontractor to Seller, are present at the Point of Destination or any work area or site controlled by Buyer, the Seller shall be responsible for the compliance by such personnel with any applicable requirements of Buyer's safety programs that are made known to Seller.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT AND AMENDING

3.01 *Intent*

- A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
- B. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce or furnish the indicated Goods and Special Services will be provided, whether or not specifically called for, at no additional cost to Buyer.
- C. Clarifications and interpretations of, or notifications of minor variations and deviations in, the Contract Documents, will be issued by Engineer as provided in Article 9.

3.02 *Standards, Specifications, Codes, Laws and Regulations*

- A. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws and Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws and Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
- B. No provision of any such standard, specification, manual or code, or any instruction of a supplier shall be effective to change the duties or responsibilities of Buyer or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to Buyer or Engineer, or any of their consultants, agents, or employees any duty or authority to supervise or direct the performance of Seller's obligations or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

- 1. *Seller's Review of Contract Documents Before the Performance of the Contract:* Before performance of the Contract, Seller shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Seller shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Seller discovers or has actual knowledge of and shall obtain a written interpretation or clarification from Engineer before proceeding with the furnishing of any Goods and Special Services affected thereby.
- 2. *Seller's Review of Contract Documents During the Performance of the Contract:* If, during the performance of the Contract, Seller discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of

any Law or Regulation applicable to the performance of the Contract, any standard, specification, manual or code, or of any instruction of any Supplier, Seller shall promptly report it to Engineer in writing. Seller shall not proceed with the furnishing of the Goods and Special Services affected thereby until an amendment to or clarification of the Contract Documents has been issued.

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

- B. *Resolving Discrepancies:* Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

- 1. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
- 2. the provisions of any Laws or Regulations applicable to the furnishing of the Goods and Special Services (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Clarifying Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions to the Goods and Special Services or to modify contractual terms and conditions by a Change Order.
- B. Buyer may issue a Work Change Directive providing for additions, deletions, or revisions to the Goods and Special Services, in which case (1) the Contract Price shall be equitably adjusted to account for any reasonable and necessary credits to Buyer for any such deletion, or for costs (including reasonable overhead and profit) incurred by Seller to accommodate such an addition or revision and (2) the Contract Times shall be equitably adjusted to account for any impact on progress and completion of performance. Such adjustments

subsequently shall be duly set forth in a Change Order.

- C. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Goods and Special Services may be authorized, by one or more of the following ways:

1. A Field Order;
2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 5.06.D.3); or
3. Engineer's written interpretation or clarification.

ARTICLE 4 - BONDS AND INSURANCE

4.01 Bonds

- A. Seller shall furnish to Buyer performance and payment bonds, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Seller's obligations under the Contract Documents. These bonds shall remain in effect until 1) one year after the date when final payment becomes due or 2) completion of the correction period specified in Paragraph 8.03, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Seller shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds 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 shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Seller is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the

requirements of Paragraph 4.01.B, Seller shall promptly notify Buyer and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 4.01.B and 4.02.

4.02 Insurance

- A. Seller shall provide insurance of the types and coverages and in the amounts stipulated in the Supplementary Conditions.
- B. Failure of Buyer to demand certificates of insurance or other evidence of Seller's full compliance with these insurance requirements or failure of Buyer to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Seller's obligation to maintain such insurance.
- C. Upon assignment of this Contract, Seller shall comply with the written request of assignee to provide certificates of insurance to assignee.
- D. Buyer does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Seller.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Seller's liability under the indemnities granted to Buyer in the Contract Documents.

4.03 Licensed Sureties and Insurers

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Buyer or Seller shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

ARTICLE 5 - SELLER'S RESPONSIBILITIES

5.01 Supervision and Superintendence

- A. Seller shall supervise, inspect, and direct the furnishing of the Goods and Special Services competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform its

obligations in accordance with the Contract Documents. Seller shall be solely responsible for the means, methods, techniques, sequences, and procedures necessary to perform its obligations in accordance with the Contract Documents. Seller shall not be responsible for the negligence of Buyer or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure that is shown or indicated in and expressly required by the Contract Documents.

5.02 *Labor, Materials and Equipment*

- A. Seller shall provide competent, qualified and trained personnel in all aspects of its performance of the Contract.
- B. All Goods, and all equipment and material incorporated into the Goods, shall be as specified, and unless specified otherwise in the Contract Documents, shall be:
 - 1. new, and of good quality;
 - 2. protected, assembled, connected, cleaned, and conditioned in accordance with the original manufacturer's instructions; and
 - 3. shop assembled to the greatest extent practicable.

5.03 *Laws and Regulations*

- A. Seller shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of its obligations in accordance with the Contract Documents. Except where otherwise expressly required by such Laws and Regulations, neither Buyer nor Engineer shall be responsible for monitoring Seller's compliance with any Laws or Regulations.
- B. If Seller furnishes Goods and Special Services knowing or having reason to know that such furnishing is contrary to Laws or Regulations, Seller shall bear 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 performance. It shall not be Seller's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this provision shall not relieve Seller of Seller's obligations under Paragraph 3.03.

- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance shall be the subject of an adjustment in Contract Price or Contract Times. If Buyer and Seller are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 9.06.

5.04 *Or Equals*

- A. Whenever the Goods, or an item of material or equipment to be incorporated into the Goods, are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier or manufacturer, the specification or description 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, other items of material or equipment or material or equipment of other suppliers or manufacturers may be submitted to Buyer for Engineer's review.
 - 1. If in Engineer's sole discretion, such an item of material or equipment proposed by Seller is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by Engineer as an "or-equal" item.
 - 2. For the purposes of this paragraph, a proposed item of material or equipment may be considered functionally equal to an item so named only if:
 - a. in the exercise of reasonable judgment, Engineer determines that:
 - 1) it is at least equal in quality, durability, appearance, strength, and design characteristics; 2) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; 3) it has an acceptable record of performance and availability of responsive service; and
 - b. Seller certifies that if approved: 1) there will be no increase in any cost, including capital, installation or operating costs, to Buyer; and 2) the proposed item will conform

substantially to the detailed requirements of the item named in the Contract Documents.

- B. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraph 5.04.A. Engineer will be the sole judge of whether to accept or reject such a proposal or submittal. No "or-equal" will be ordered, manufactured or utilized until Engineer's review is complete, which will be evidenced by an approved Shop Drawing. Engineer will advise Buyer and Seller in writing of any negative determination. Notwithstanding Engineer's approval of an "or-equal" item, Seller shall remain obligated to comply with the requirements of the Contract Documents.
- C. *Special Guarantee:* Buyer may require Seller to furnish at Seller's expense a special performance guarantee or other surety with respect to any such proposed "or-equal."
- D. *Data:* Seller shall provide all data in support of any such proposed "or-equal" at Seller's expense.

5.05 Taxes

- A. Seller shall be responsible for all taxes and duties arising out of the sale of the Goods and the furnishing of Special Services. All taxes are included in the Contract Price, except as noted in the Supplementary Conditions.

5.06 Shop Drawings and Samples

- A. Seller shall submit Shop Drawings and Samples to Buyer for Engineer's review and approval in accordance with the schedule required in Paragraph 2.06.A. All submittals will be identified as required and furnished in the number of copies specified in the Contract Documents. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Seller proposes to provide.
- B. Where a Shop Drawing or Sample is required by the Contract Documents, any related work performed prior to Engineer's approval of the pertinent submittal will be at the sole expense and responsibility of Seller.

C. Submittal Procedures:

1. Before submitting each Shop Drawing or Sample, Seller shall have determined and verified:
 - a. all field measurements (if required), quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto; and
 - b. that all materials are suitable with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the furnishing of Goods and Special Services.
2. Seller shall also have reviewed and coordinated each Shop Drawing or Sample with the Contract Documents.
3. Each submittal shall bear a stamp or include a written certification from Seller that Seller has reviewed the subject submittal and confirmed that it is in compliance with the requirements of the Contract Documents. Both Buyer and Engineer shall be entitled to rely on such certification from Seller.
4. With each submittal, Seller shall give Buyer and Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both in a written communication separate from the submittal and by specific notation on each Shop Drawing or Sample.

D. Engineer's Review:

1. Engineer will provide timely review of Shop Drawings and Samples.
2. Engineer's review and approval will be only to determine if the Goods and Special Services covered by the submittals will, after installation or incorporation in the Project, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole.

3. Engineer's review and approval shall not relieve Seller from responsibility for any variation from the requirements of the Contract Documents unless Seller has complied with the requirements of Paragraph 5.06.C.4 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's review and approval shall not relieve Seller from responsibility for complying with the requirements of Paragraph 5.06.C.1.

E. *Resubmittal Procedures:*

1. Seller 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. Seller shall direct specific attention in writing to any revisions other than the corrections called for by Engineer on previous submittals.

5.07 *Continuing Performance*

- A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06.A., and the Goods shall be delivered and the Special Services furnished within the Contract Times specified in the Agreement.
- B. Seller shall carry on furnishing of the Goods and Special Services and adhere to the progress schedule during all disputes or disagreements with Buyer. No furnishing of Goods and Special Services shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraphs 11.03 or 11.04, or as Buyer and Seller may otherwise agree in writing.

5.08 *Seller's Warranties and Guarantees*

- A. Seller warrants and guarantees to Buyer that the title to the Goods conveyed shall be proper, its transfer rightful, and free from any security interest, lien, or other encumbrance. Seller shall defend, indemnify, and hold Buyer harmless against any liens, claims, or demands contesting or affecting title of the Goods conveyed.
- B. Seller warrants and guarantees to Buyer that all Goods and Special Services will conform with the

Contract Documents, and with the standards established by any Samples approved by Engineer. Engineer shall be entitled to rely on Seller's warranty and guarantee. If the Contract Documents do not otherwise specify the characteristics or the quality of the Goods, the Goods shall comply with the requirements of Paragraph 5.02.B.

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

1. abuse, improper modification, improper maintenance, or improper operation by persons other than Seller; or
2. corrosion or chemical attack, unless corrosive or chemically-damaging conditions were disclosed by Buyer in the Contract Documents and the Contract Documents required the Goods to withstand such conditions;
3. use in a manner contrary to Seller's written instructions for installation, operation, and maintenance; or
4. normal wear and tear under normal usage.

D. Seller's obligation to furnish the Goods and Special Services in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Goods and Special Services that are non-conforming, or a release of Seller's obligation to furnish the Goods and Special Services in accordance with the Contract Documents:

1. observations by Buyer or Engineer;
2. recommendation by Engineer or payment by Buyer of any progress or final payment;
3. use of the Goods by Buyer;
4. any acceptance by Buyer (subject to the provisions of Paragraph 8.02.D.1) or any failure to do so;
5. the issuance of a notice of acceptance by Buyer pursuant to the provisions of Article 8;
6. any inspection, test or approval by others; or

7. any correction of non-conforming Goods and Special Services by Buyer.

- E. Buyer shall promptly notify Seller of any breach of Seller's warranties or guarantees.
- F. Seller makes no implied warranties under this Contract.

5.09 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, Seller shall indemnify and hold harmless Buyer and Engineer, and the officers, directors, members, partners, employees, agents, consultants, contractors, 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 performance of Seller's obligations under the Contract Documents, provided that any such claim, cost, loss, or damages attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Goods themselves), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Seller, or any individual or entity directly or indirectly employed by Seller or anyone for whose acts Seller may be liable.
- B. In any and all claims against Buyer or Engineer or any of their respective assignees, consultants, agents, officers, directors, members, partners, employees, agents, consultants, contractors, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Seller, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to furnish any of the Goods and Special Services, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 5.09.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for seller or any such subcontractor, supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Seller under Paragraph 5.09.A shall not extend to the liability of Engineer and Engineer's officers, directors,

partners, employees, agents, and consultants arising out of:

- 1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
- 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

5.10 Delegation of Professional Design Services

- A. Seller will not be required to provide professional design services unless such services are specifically required by the Contract Documents or unless such services are required to carry out Seller's responsibilities for furnishing the Goods and Special Services. Seller shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to the Goods and Special Services are specifically required of Seller by the Contract Documents, Buyer and Engineer will specify all performance and design criteria that such services must satisfy. Seller shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Goods and Special Services designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Buyer and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Buyer and Engineer have specified to Seller all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 5.10, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design

drawings) will be only for the purpose stated in Paragraph 5.06.D.2.

- E. Seller shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 6 - SHIPPING AND DELIVERY

6.01 Shipping

- A. Seller shall select the carrier and bear all costs of packaging, transportation, insurance, special handling and any other costs associated with shipment and delivery.

6.02 Delivery

- A. Seller shall deliver the Goods F.O.B. the Point of Destination in accordance with the Contract Times set forth in the Agreement, or other date agreed to by Buyer and Seller.
- B. Seller shall provide written notice to Buyer at least 10 days before shipment of the manner of shipment and the anticipated delivery date. The notice shall also include any instructions concerning special equipment or services required at the Point of Destination to unload and care for the Goods. Seller shall also require the carrier to give Buyer at least 24 hours' notice by telephone prior to the anticipated time of delivery.
- C. Buyer will be responsible and bear all costs for unloading the Goods from carrier.
- D. Buyer will assure that adequate facilities are available to receive delivery of the Goods during the Contract Times for delivery set forth in the Agreement, or another date agreed by Buyer and Seller.
- E. No partial deliveries shall be allowed, unless permitted or required by the Contract Documents or agreed to in writing by Buyer.

6.03 Risk of Loss

- A. Risk of loss and insurable interests transfer from Seller to Buyer upon Buyer's receipt of the Goods.
- B. Notwithstanding the provisions of Paragraph 6.03.A, if Buyer rejects the Goods as non-conforming, the risk of loss on such Goods shall remain with Seller until Seller corrects the non-conformity or Buyer accepts the Goods. If rejected

Goods remain at the Point of Destination pending modification and acceptance, then Seller shall be responsible for arranging adequate protection and maintenance of the Goods at Seller's expense.

6.04 Progress Schedule

- A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06 as it may be adjusted from time to time as provided below.
 - 1. Seller shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.06) proposed adjustments in the progress schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the progress schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 7. Adjustments in Contract Times may only be made by a Change Order.

ARTICLE 7 - CHANGES: SCHEDULE AND DELAY

7.01 Changes in the Goods and Special Services

- A. Buyer may at any time, without notice to any surety, make an addition, deletion, or other revision to the Contract Documents with respect to the Goods and Services, within the general scope of the Contract, by a Change Order or Work Change Directive. Upon receipt of any such document, Seller shall promptly proceed with performance pursuant to the revised Contract Documents (except as otherwise specifically provided).
- B. If Seller concludes that a Work Change Directive issued by Buyer affects the Contract Price or Contract Times, then Seller shall notify Buyer within 15 days after Seller has received the Work Change Directive, and submit written supporting data to Buyer within 45 days after such receipt. If Seller fails to notify Buyer within 15 days, Seller waives any Claim for such adjustment. If Buyer and Seller are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 9.06.

- C. Seller shall not suspend performance while Buyer and Seller are in the process of making such changes and any related adjustments to Contract Price or Contract Times.

7.02 *Changing Contract Price or Contract Times*

- A. The Contract Price or Contract Times may only be changed by a Change Order.
- B. Any Claim for an adjustment in the Contract Price or Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 9.06.
- C. If Seller is prevented from delivering the Goods or performing the Special Services within the Contract Times for any unforeseen reason beyond its control and not attributable to its actions or inactions, then Seller shall be entitled to an adjustment of the Contract Times to the extent attributable to such reason. Such reasons include but are not limited to acts or neglect by Buyer, inspection delays, fires, floods, epidemics, abnormal weather conditions, acts of God, and other like matters. If such an event occurs and delays Seller's performance, Seller shall notify Buyer in writing within 15 days of knowing or having reason to know of the beginning of the event causing the delay, stating the reason therefor.
- D. Seller shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Seller. Delays attributable to and within the control of Seller's subcontractors or suppliers shall be deemed to be delays within the control of Seller.
- E. If Seller is prevented from delivering the Goods or furnishing the Special Services within the Contract Times due to the actions or inactions of Buyer, Seller shall be entitled to any reasonable and necessary additional costs arising out of such delay to the extent directly attributable to Buyer.
- F. Neither Buyer nor Seller shall be entitled to any damages arising from delays which are beyond the control of both Buyer and Seller, including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, and other like matters.

ARTICLE 8 - BUYER'S RIGHTS

8.01 *Inspections and Testing*

A. General:

1. The Contract Documents specify required inspections and tests. Buyer shall have the right to perform, or cause to be performed, reasonable inspections and require reasonable tests of the Goods at Seller's facility, and at the Point of Destination. Seller shall allow Buyer a reasonable time to perform such inspections or tests.
2. Seller shall reimburse Buyer for all expenses, except for travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, for inspections and tests specified in the Contract Documents. If as the result of any such specified testing the Goods are determined to be non-conforming, then Seller shall also bear the travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, and all expenses of re-inspection or retesting.
3. Buyer shall bear all expenses of inspections and tests that are not specified in the Contract Documents (other than any re-inspection or retesting resulting from a determination of non-conformity, as set forth in Paragraph 8.01.A.2 immediately above); provided, however, that if as the result of any such non-specified inspections or testing the Goods are determined to be non-conforming, then Seller shall bear all expenses of such inspections and testing, and of any necessary re-inspection and retesting.
4. Seller shall provide Buyer timely written notice of the readiness of the Goods for all inspections, tests, or approvals which the Contract Documents specify are to be observed by Buyer prior to shipment.
5. Buyer will give Seller timely notice of all specified tests, inspections, and approvals of the Goods which are to be conducted at the Point of Destination.
6. If, on the basis of any inspections or testing, the Goods appear to be conforming, Buyer will give Seller prompt

notice thereof. If on the basis of said inspections or testing, the Goods appear to be non-conforming, Buyer will give Seller prompt notice thereof and will advise Seller of the remedy Buyer elects under the provisions of Paragraph 8.02.

7. Neither payments made by Buyer to Seller prior to any tests or inspections, nor any tests or inspections shall constitute acceptance of non-conforming Goods, or prejudice Buyer's rights under the Contract.

B. Inspection on Delivery:

1. Buyer or Engineer will visually inspect the Goods upon delivery solely for purposes of identifying the Goods and general verification of quantities and observation of apparent condition in order to provide a basis for a progress payment. Such visual inspection will not be construed as final or as receipt of any Goods and Special Services that, as a result of subsequent inspections and tests, are determined to be non-conforming.
2. Within ten days of such visual inspection, Buyer shall provide Seller with written notice of Buyer's determination regarding conformity of the Goods. In the event Buyer does not provide such notice, it will be presumed that the Goods appear to be conforming and that Buyer has acknowledged their receipt upon delivery.
3. If, on the basis of the visual inspection specified in Paragraph 8.01.B.1, the Goods appear to be conforming, Buyer's notice thereof to Seller will acknowledge receipt of the Goods.

C. Final Inspection:

1. After all of the Goods have been incorporated into the Project, tested in accordance with such testing requirements as are specified, and are functioning as indicated, Buyer or Engineer will make a final inspection.
2. If, on the basis of the final inspection, the Goods are conforming, Buyer's notice thereof will constitute Buyer's acceptance of the Goods.

3. If, on the basis of the final inspection, the Goods are non-conforming, Buyer will identify the non-conformity in writing.

8.02 *Non-Conforming Goods and Special Services*

- A. If, on the basis of inspections and testing prior to delivery, the Goods and Special Services are found to be non-conforming, or if at any time after Buyer has acknowledged receipt of delivery and before the expiration of the correction period described in Paragraph 8.03, Buyer determines that the Goods and Special Services are non-conforming, then Seller shall promptly, without cost to Buyer and in response to written instructions from Buyer, either correct such non-conforming Goods and Special Services, or, if Goods are rejected by Buyer, remove and replace the non-conforming Goods with conforming Goods, including all work required for reinstallation.

B. Buyer's Rejection of Non-Conforming Goods:

1. If Buyer elects to reject the Goods in whole or in part, Buyer's notice to Seller will describe in sufficient detail the non-conforming aspect of the Goods. If Goods have been delivered to Buyer, Seller shall promptly, and within the Contract Times, remove and replace the rejected Goods.
2. Seller shall bear all costs, losses and damages attributable to the removal and replacement of the non-conforming Goods as provided in Paragraph 8.02.E.
3. Upon rejection of the Goods, Buyer retains a security interest in the Goods to the extent of any payments made and expenses incurred in their testing and inspection.

C. Remedying Non-Conforming Goods and Special Services:

1. If Buyer elects to permit the Seller to modify the Goods to correct the non-conformance, then Seller shall promptly provide a schedule for such modifications and shall make the Goods conforming within a reasonable time.
2. If Buyer notifies Seller in writing that any of the Special Services are non-conforming, Seller shall promptly provide conforming services acceptable to Buyer.

If Seller fails to do so, Buyer may delete the Special Services and reduce the Contract Price a commensurate amount.

D. Buyer's Acceptance of Non-Conforming Goods:

1. Instead of requiring correction or removal and replacement of non-conforming Goods discovered either before or after final payment, Buyer may accept the non-conforming Goods. Seller shall bear all reasonable costs, losses, and damages attributable to Buyer's evaluation of and determination to accept such non-conforming Goods as provided in Paragraph 8.02.E.

- E. Seller shall pay all claims, costs, losses, and damages, including but not limited to all fees and charges for re-inspection, retesting and for any engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs arising out of or relating to the non-conforming Goods and Special Services. Seller's obligations shall include the costs of the correction or removal and replacement of the non-conforming Goods and the replacement of property of Buyer and others destroyed by the correction or removal and replacement of the non-conforming Goods, and obtaining conforming Special Services from others.

F. Buyer's Rejection of Conforming Goods:

1. If Buyer asserts that Goods and Special Services are non-conforming and such Goods and Special Services are determined to be conforming, or if Buyer rejects as non-conforming Goods and Special Services that are later determined to be conforming, then Seller shall be entitled to reimbursement from Buyer of costs incurred by Seller in inspecting, testing, correcting, removing, or replacing the conforming Goods and Special Services, including but not limited to fees and charges of engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs associated with the incorrect assertion of non-conformance or rejection of conforming Goods and Special Services.

8.03 *Correction Period*

- A. Seller's responsibility for correcting all non-conformities in the Goods and Special Services will extend for a period of one year after the earlier of the date on which Buyer has placed the Goods in continuous service or the date of final payment, or for such longer period of time as may be prescribed by Laws or Regulations or by the terms of any specific provisions of the Contract Documents.

ARTICLE 9 - ROLE OF ENGINEER

9.01 *Duties and Responsibilities*

- A. The duties and responsibilities and the limitations of authority of Engineer are set forth in the Contract Documents.

9.02 *Clarifications and Interpretations*

- A. Engineer will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents as Engineer may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. Such written clarifications and interpretations will be binding on Buyer and Seller. If either Buyer or Seller believes that a written clarification or interpretation justifies an adjustment in the Contract Price or Contract Times, either may make a Claim therefor.

9.03 *Authorized Variations*

- A. Engineer may authorize minor deviations or variations in the Contract Documents by: 1) written approval of specific variations set forth in Shop Drawings when Seller has duly noted such variations as required in Paragraph 5.06.C.4, or 2) a Field Order.

9.04 *Rejecting Non-Conforming Goods and Special Services*

- A. Engineer will have the authority to disapprove or reject Goods and Special Services that Engineer believes to be non-conforming. Engineer will also have authority to require special inspection or testing of the Goods or Special Services as provided in Paragraph 8.01 whether or not the Goods are fabricated or installed, or the Special Services are completed.

9.05 *Decisions on Requirements of Contract Documents*

- A. Engineer will be the initial interpreter of the Contract Documents and judge of the acceptability of the Goods and Special Services. Claims, disputes and other matters relating to the acceptability of the Goods and Special Services or the interpretation of the requirements of the Contract Documents pertaining to Seller's performance will be referred initially to Engineer in writing with a request for a formal decision in accordance with this paragraph.
- B. When functioning as interpreter and judge under this Paragraph 9.05, Engineer will not show partiality to Buyer or Seller and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by Engineer pursuant to this Paragraph 9.05 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 10.07) will be a condition precedent to any exercise by Buyer or Seller of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.06 *Claims and Disputes*

- A. *Notice:* Written notice of each Claim relating to the acceptability of the Goods and Special Services or the interpretation of the requirements of the Contract Documents pertaining to either party's performance shall be delivered by the claimant to Engineer and the other party to the Agreement within 15 days after the occurrence of the event giving rise thereto, and written supporting data shall be submitted to Engineer and the other party within 45 days after such occurrence unless Engineer allows an additional period of time to ascertain more accurate data.
- B. *Engineer's Decision:* Engineer will review each such Claim and render a decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.
- C. If Engineer does not render a formal written decision on a Claim within the time stated in Paragraph 9.06.B., Engineer shall be deemed to have issued a decision denying the Claim in its entirety 31 days after receipt of the last submittal of

the claimant or the last submittal of the opposing party, if any.

- D. Engineer's written decision on such Claim or a decision denying the Claim in its entirety that is deemed to have been issued pursuant to Paragraph 9.06.C, will be final and binding upon Buyer and Seller 30 days after it is issued unless within 30 days of issuance Buyer or Seller appeals Engineer's decision by initiating the mediation of such Claim in accordance with the dispute resolution procedures set forth in Article 13.
- E. If Article 13 has been amended to delete the mediation requirement, then Buyer or Seller may appeal Engineer's decision within 30 days of issuance by following the alternative dispute resolution process set forth in Article 13, as amended; or if no such alternative dispute resolution process has been set forth, Buyer or Seller may appeal Engineer's decision by 1) delivering to the other party within 30 days of the date of such decision a written notice of intent to submit the Claim to a court of competent jurisdiction, and 2) within 60 days after the date of such decision instituting a formal proceeding in a court of competent jurisdiction.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 9.06.
- G. The parties agree to endeavor to avoid or resolve Claims through direct, good faith discussions and negotiations whenever practicable. Such discussions and negotiations should at the outset address whether the parties mutually agree to suspend the time periods established in this Paragraph 9.06; if so, a written record of such mutual agreement should be made and jointly executed.

ARTICLE 10 - PAYMENT

10.01 *Applications for Progress Payments*

- A. Seller shall submit to Buyer for Engineer's review Applications for Payment filled out and signed by Seller and accompanied by such supporting documentation as is required by the Contract Documents and also as Buyer or Engineer may reasonably require. The timing and amounts of progress payments shall be as stipulated in the Agreement.

1. The first application for Payment will be submitted after review and approval by Engineer of all Shop Drawings and of all Samples required by the Contract Documents.
2. The second Application for Payment will be submitted after receipt of the Goods has been acknowledged in accordance with Paragraph 8.01.B and will be accompanied by a bill of sale, invoice, or other documentation reasonably satisfactory to Buyer warranting that Buyer has rightfully received good title to the Goods from Seller and that, upon payment, the Goods will be free and clear of all liens. Such documentation will include releases and waivers from all parties with viable lien rights. In the case of multiple deliveries of Goods, additional Applications for Payment accompanied by the required documentation will be submitted as Buyer acknowledges receipt of additional items of the Goods.

10.02 *Review of Applications for Progress Payments*

- A. Engineer will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Buyer, or return the Application to Seller indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Seller may make the necessary corrections and resubmit the Application.

1. Engineer's recommendation of payment requested in the first Application for Payment will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data, that the Shop Drawings and Samples have been reviewed and approved as required by the Contract Documents and Seller is entitled to payment of the amount recommended.
2. Engineer's recommendation of payment requested in the Application for Payment submitted upon Buyer's acknowledgment of receipt of the Goods will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data Seller is entitled to payment of the amount recommended. Such recommendation

will not constitute a representation that Engineer has made a final inspection of the Goods, that the Goods are free from non-conformities, acceptable or in conformance with the Contract Documents, that Engineer has made any investigation as to Buyer's title to the Goods, that exhaustive or continuous inspections have been made to check the quality or the quantity of the Goods beyond the responsibilities specifically assigned to Engineer in the Contract Documents or that there may not be other matters or issues between the parties that might entitle Seller to additional payments by Buyer or Buyer to withhold payment to Seller.

3. Engineer may refuse to recommend that all or any part of a progress payment be made, or Engineer may nullify all or any part of any payment previously recommended if, in Engineer's opinion, such recommendation would be incorrect or if on the basis of subsequently discovered evidence or subsequent inspections or tests Engineer considers such refusal or nullification necessary to protect Buyer from loss because the Contract Price has been reduced, Goods are found to be non-conforming, or Seller has failed to furnish acceptable Special Services.

10.03 *Amount and Timing of Progress Payments*

- A. Subject to Paragraph 10.02.A., the amounts of the progress payments will be as provided in the Agreement. Buyer shall within 30 days after receipt of each Application for Payment with Engineer's recommendation pay Seller the amount recommended; but, in the case of the Application for Payment upon Buyer's acknowledgment of receipt of the Goods, said 30-day period may be extended for so long as is necessary (but in no event more than 60 days) for Buyer to examine the bill of sale and other documentation submitted therewith. Buyer shall notify Seller promptly of any deficiency in the documentation and shall not unreasonably withhold payment.

10.04 *Suspension of or Reduction in Payment*

- A. Buyer may suspend or reduce the amount of progress payments, even though recommended for

payment by Engineer, under the following circumstances:

1. Buyer has reasonable grounds to conclude that Seller will not furnish the Goods or the Special Services in accordance with the Contract Documents, and
2. Buyer has requested in writing assurances from Seller that the Goods and Special Services will be delivered or furnished in accordance with the Contract Documents, and Seller has failed to provide adequate assurances within ten days of Buyer's written request.

- B. If Buyer refuses to make payment of the full amount recommended by Engineer, Buyer will provide Seller and Engineer immediate written notice stating the reason for such action and promptly pay Seller any amount remaining after deduction of the amount withheld. Buyer shall promptly pay Seller the amount withheld when Seller corrects the reason for such action to Buyer's satisfaction.

10.05 *Final Application for Payment*

- A. After Seller has corrected all non-conformities to the reasonable satisfaction of Buyer and Engineer, furnished all Special Services, and delivered all documents required by the Contract Documents, Engineer will issue to Buyer and Seller a notice of acceptance. Seller may then make application for final payment following the procedure for progress payments. The final Application for Payment will be accompanied by all documentation called for in the Contract Documents, a list of all unsettled Claims, and such other data and information as Buyer or Engineer may reasonably require.

10.06 *Final Payment*

- A. If, on the basis of final inspection and the review of the final Application for Payment and accompanying documentation, Engineer is reasonably satisfied that Seller has furnished the Goods and Special Services in accordance with the Contract Documents, and that Seller's has fulfilled all other obligations under the Contract Documents, then Engineer will, within ten days after receipt of the final Application for Payment, recommend in writing final payment subject to the provisions of Paragraph 10.07 and present the Application to Buyer. Otherwise, Engineer will return the Application to Seller, indicating the

reasons for refusing to recommend final payment, in which case Seller shall make the necessary corrections and resubmit the Application for payment. If the Application and accompanying documentation are appropriate as to form and substance, Buyer shall, within 30 days after receipt thereof, pay Seller the amount recommended by Engineer, less any sum Buyer is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages to which Buyer is entitled.

10.07 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
1. a waiver of all Claims by Buyer against Seller, except Claims arising from unsettled liens from non-conformities in the Goods or Special Services appearing after final payment, from Seller's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Seller's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Seller against Buyer (other than those previously made in accordance with the requirements herein and listed by Seller as unsettled as required in Paragraph 10.05.A, and not resolved in writing).

ARTICLE 11 - CANCELLATION, SUSPENSION, AND TERMINATION

11.01 *Cancellation*

- A. Buyer has the right to cancel the Contract, without cause, at any time prior to delivery of the Goods by written notice. Cancellation pursuant to the terms of this paragraph shall not constitute a breach of contract by Buyer. Upon cancellation:
1. Buyer shall pay Seller for the direct costs incurred in producing any Goods that Seller has specially manufactured for the Project, plus a fair and reasonable amount for overhead and profit.
 2. For Goods that are not specially manufactured for the Project, Seller shall be entitled to a restocking charge of 10

percent of the unpaid Contract Price of such Goods.

remedies provided by Laws and Regulations.

11.02 *Suspension of Performance by Buyer*

- A. Buyer has the right to suspend performance of the Contract for up to a maximum of ninety days, without cause, by written notice. Upon suspension under this paragraph, Seller shall be entitled to an increase in the Contract Times and Contract Price caused by the suspension, provided that performance would not have been suspended or delayed for causes attributable to Seller.

11.03 *Suspension of Performance by Seller*

- A. Subject to the provisions of Paragraph 5.07.B, Seller may suspend the furnishing of the Goods and Special Services only under the following circumstance:
1. Seller has reasonable grounds to conclude that Buyer will not perform its future payment obligations under the Contract; and,
 2. Seller has requested in writing assurances from Buyer that future payments will be made in accordance with the Contract, and Buyer has failed to provide such assurances within ten days of Seller's written request.

11.04 *Breach and Termination*

A. Buyer's Breach:

1. Buyer shall be deemed in breach of the Contract if it fails to comply with any material provision of the Contract Documents, including but not limited to:
 - a. wrongful rejection or revocation of Buyer's acceptance of the Goods,
 - b. failure to make payments in accordance with the Contract Documents, or
 - c. wrongful repudiation of the Contract.
2. Seller shall have the right to terminate the Contract for cause by declaring a breach should Buyer fail to comply with any material provisions of the Contract. Upon termination, Seller shall be entitled to all

- a. In the event Seller believes Buyer is in breach of its obligations under the Contract, Seller shall provide Buyer with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Buyer shall have seven days from receipt of the written notice declaring the breach (or such longer period of time as Seller may grant in writing) within which to cure or to proceed diligently to cure such alleged breach.

B. Seller's Breach:

1. Seller shall be deemed in breach of the Contract if it fails to comply with any material provision of the Contract Documents, including, but not limited to:
 - a. failure to deliver the Goods or perform the Special Services in accordance with the Contract Documents,
 - b. wrongful repudiation of the Contract, or
 - c. delivery or furnishing of non-conforming Goods and Special Services.
2. Buyer may terminate Seller's right to perform the Contract for cause by declaring a breach should Seller fail to comply with any material provision of the Contract Documents. Upon termination, Buyer shall be entitled to all remedies provided by Laws and Regulations.
 - a. In the event Buyer believes Seller is in breach of its obligations under the Contract, and except as provided in Paragraph 11.04.B.2.b, Buyer shall provide Seller with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Seller shall have seven days from receipt of the written notice declaring the breach (or such longer period of time as Buyer may grant in

writing) within which to cure or to proceed diligently to cure such alleged breach.

- b. If and to the extent that Seller has provided a performance bond under the provisions of Paragraph 4.01, the notice and cure procedures of that bond, if any, shall supersede the notice and cure procedures of Paragraph 11.04.B.2.a.

ARTICLE 12 - LICENSES AND FEES

12.01 *Intellectual Property and License Fees*

- A. Unless specifically stated elsewhere in the Contract Documents, Seller is not transferring any intellectual property rights, patent rights, or licenses for the Goods delivered. However, in the event the Seller is manufacturing to Buyer's design, Buyer retains all intellectual property rights in such design.
- B. Seller shall pay all license fees and royalties and assume all costs incident to the use or the furnishing of the Goods, unless specified otherwise by the Contract Documents.

12.02 *Seller's Infringement*

- A. Subject to Paragraph 12.01.A, Seller shall indemnify and hold harmless Buyer, Engineer and their officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all reasonable 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 or alleged infringement of any United States or foreign patent or copyright by any of the Goods as delivered hereunder.
- B. In the event of suit or threat of suit for intellectual property infringement, Buyer will promptly notify Seller of receiving notice thereof.
- C. Seller shall promptly defend the claim or suit, including negotiating a settlement. Seller shall have control over such claim or suit, provided that Seller agrees to bear all expenses and to satisfy any adverse judgment thereof.

1. If Seller fails to defend such suit or claim after written notice by Buyer, Seller will be bound in any subsequent suit or claim against Seller by Buyer by any factual determination in the prior suit or claim.
2. If Buyer fails to provide Seller the opportunity to defend such suit or claim after written notice by Seller, Buyer shall be barred from any remedy against Seller for such suit or claim.

- D. If a determination is made that Seller has infringed upon intellectual property rights of another, Seller may obtain the necessary licenses for Buyer's benefit, or replace the Goods and provide related design and construction as necessary to avoid the infringement at Seller's own expense.

12.03 *Buyer's Infringement*

- A. Buyer shall indemnify and hold harmless Seller, and its officers, directors, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all reasonable 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 or alleged infringement of any United States or foreign patent or copyright caused by Seller's compliance with Buyer's design of the Goods or Buyer's use of the Goods in combination with other materials or equipment in any process (unless intent of such use was known to Seller and Seller had reason to know such infringement would result).
- B. In the event of suit or threat of suit for intellectual property infringement, Seller must after receiving notice thereof promptly notify Buyer.
- C. Upon written notice from Seller, Buyer shall be given the opportunity to defend the claim or suit, including negotiating a settlement. Buyer shall have control over such claim or suit, provided that Buyer agrees to bear all expenses and to satisfy any adverse judgment thereof.
 1. If Buyer fails to defend such suit or claim after written notice by Seller, Buyer will be bound in any subsequent suit or claim against Buyer by Seller by any factual determination in the prior suit or claim.

2. If Seller fails to provide Buyer the opportunity to defend such suit or claim after written notice by Buyer, Seller shall be barred from any remedy against Buyer for such suit or claim.

12.04 *Reuse of Documents*

- A. Neither Seller nor any other person furnishing any of the Goods and Special Services under a direct or indirect contract with Seller shall: (1) 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 (2) reuse any of such Drawings, Specifications, other documents, or copies thereof on any other project without written consent of Buyer and Engineer and specific written verification or adaptation by Engineer. This prohibition will survive termination or completion of the Contract. Nothing herein shall preclude Seller from retaining copies of the Contract Documents for record purposes.

12.05 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, copies of data furnished by Buyer or Engineer to Seller, or by Seller to Buyer or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. The transferring party will correct any errors detected within the 60-day acceptance period.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages,

operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 13 - DISPUTE RESOLUTION

13.01 *Dispute Resolution Method*

- A. Either Buyer or Seller may initiate the mediation of any Claim decided in writing by Engineer under Paragraph 9.06.B or 9.06.C before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the Engineer's decision from becoming final and binding.
- B. Buyer and Seller shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the mediation process does not result in resolution of the Claim, then Engineer's written decision under Paragraph 9.06.B or a denial pursuant to Paragraph 9.06.C shall become final and binding 30 days after termination of the mediation unless, within that time period, Buyer or Seller:
 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or
 2. agrees with the other party to submit the Claim to another dispute resolution process, or
 3. if no dispute resolution process has been provided for in the Supplementary Conditions, delivers to the other party written notice of the intent to submit the Claim to a court of competent jurisdiction, and within 60 days of the termination of the mediation institutes such formal proceeding.

ARTICLE 14 - MISCELLANEOUS

14.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if: 1) delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or 2) if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

14.02 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Point of Destination is located.
- B. In the case of any conflict between the express terms of this Contract and the Uniform Commercial Code, as adopted in the state whose law governs, it is the intent of the parties that the express terms of this Contract shall apply.

14.03 *Computation of Time*

- A. When any period of time is referred to in the Contract Documents 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 shall be omitted from the computation.

14.04 *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 Documents, and 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.

14.05 *Survival of Obligations*

- A. All representations, indemnifications, warranties and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Goods and Special Services and termination or completion of the Agreement.

14.06 *Entire Agreement*

- A. Buyer and Seller agree that this Agreement is the complete and final agreement between them, and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may not be altered, modified, or amended except in writing signed by an authorized representative of both parties.

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions for Procurement Contracts and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

The address system used in the Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix “SC” added thereto.

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

SC-1.01.A. Add the following new paragraph immediately after Paragraph 1.01.A.36:

1.01.A.37. *Unit Price Goods and Special Services*—Goods and Special Services to be paid for on the basis of unit prices.

SC-2.03. Delete Paragraph 2.03.A in its entirety, and insert the following:

2.03.A. Buyer will furnish Seller electronic copies of the Contract Documents.

SC-2.04. Delete the third sentence of Paragraph 2.04.A. in its entirety.

SC-4.01.A and 4.01.B. Delete Paragraphs 4.01.A and 4.01.B in their entirety, and insert the following:

4.01.A. Seller shall furnish to Buyer a supply contract bond in an amount at least equal to the Contract Price. The bond shall be delivered in accordance with Paragraph 2.01 and shall remain in effect at least 1 year after the date final payment is due, except as provided otherwise by Laws or Regulations.

4.01.B. The bond shall be issued in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations and shall be executed by a surety named in the current list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. Bond signed by an agent must be accompanied by a certified copy of such agent’s authority to act.

Surety and insurance companies from which the bonds and insurance for this Project are purchased shall have a Best’s rating of no less than A:VII, in addition to the other requirements specified herein.

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SC-4.02. Add the following new paragraphs immediately after Paragraph 4.02.E:

4.02.F. Seller shall purchase and maintain such liability and other insurance as is appropriate for the furnishing of Goods and Special Services and as will provide protection from claims set forth below which may arise out of or result from Seller's furnishing of the Goods or Special Services and Seller's other obligations under the Contract Documents, whether the furnishing of Goods and Special Services, or other obligations are to be performed by Seller, any subcontractor or supplier, or by anyone directly or indirectly employed by any of them to furnish the Goods and Special Services, or by anyone for whose acts any of them may be liable:

4.02.F.1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

4.02.F.2. claims for damages because of bodily injury, occupational sickness or disease, or death of Seller's employees;

4.02.F.3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Seller's employees;

4.02.F.4. claims from damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by Seller, or (ii) by any other person for any other reason;

4.02.F.5. claims for damages, other than to the Goods, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

4.02.F.6. claims 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.

4.02.G. The policies of insurance required by this Paragraph 4.02 to be purchased and maintained shall:

4.02.G.1. with respect to insurance required by Paragraphs SC-4.02.F.3 through SC-4.02.F.6 inclusive, include as additional insured (subject to any customary exclusion in respect of professional liability):

4.02.G.1.a. Tehama-Colusa Canal Authority, 5513 Highway 162,
Willows, CA 95988.

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4.02.G.1.b. Jacobs Engineering Group Inc. at 2525 Airpark Drive,
Redding, CA 96001.

4.02.G.1.c. U.S. Bureau of Reclamation.

all of whom shall be listed as additional insured, 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 to these additional insureds shall provide primary coverage for all claims covered thereby;

4.02.G.2. include at least the specific coverages and be written for not less than limits of liability provided below or required by Laws or Regulations, whichever is greater;

4.02.G.3. include completed operations insurance;

4.02.G.4. include contractual liability insurance covering Seller's indemnity obligations under Paragraphs 5.09 and 12.02;

4.02.G.5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 30 days prior written notice has been given to Buyer and Seller, and to each other additional insured identified in these Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by Seller pursuant to Paragraph SC-4.02.I will so provide);

4.02.G.6. remain in effect at least until final payment and at all times thereafter when Seller may be correcting, removing, or replacing nonconforming Goods in accordance with Paragraph 8.03;

4.02.G.7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least 2 years after final payment (and Seller shall furnish Buyer and each other additional insured identified in these Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Buyer and any such additional insured of continuation of such insurance at final payment and 1 year thereafter); and

4.02.G.8. with respect to any delegation of professional design services to Seller pursuant to Paragraph 5.10 of the General Conditions, include professional liability coverage by endorsement or otherwise.

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4.02.H. The limits of liability for the insurance required by Paragraph SC-4.02.F shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

4.02.H.1. Workers' Compensation, and related coverage under Paragraphs SC-4.02.F.1 and SC-4.02.F.2:

4.02.H.1.a. State: Statutory.

4.02.H.1.b. Applicable Federal (e.g. Longshoreman's): Statutory.

4.02.H.1.c. Employer's Liability: \$1,000,000 per accident.

4.02.H.2. Seller's General Liability under Paragraphs SC-4.02.F.3 through SC-4.02.F.6 which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of Seller:

4.02.H.2.a. General Aggregate: \$2,000,000

4.02.H.2.b. Products (Completed Operations Aggregate): \$2,000,000

4.02.H.2.c. Personal and Advertising Injury: \$1,000,000

Injury: \$1,000,000

Each Occurrence

(Bodily Injury and Property Damage): \$1,000,000

4.02.H.2.d. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.

4.02.H.2.e. Excess or Umbrella Liability:

General Aggregate: \$5,000,000

Each Occurrence: \$5,000,000

4.02.H.3. Automobile Liability under Paragraph SC-4.02.F.6:

4.02.H.3.a. Bodily Injury:

Each person: \$1,000,000

Each Accident: \$2,000,000

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4.02.H.3.b. Property Damage:

Each Person:	\$1,000,000
Combined Single Limit of:	\$2,000,000

4.02.H.4. Professional Liability (if professional services have been delegated to Seller pursuant to Paragraph 5.10): \$1,000,000

4.02.I. Seller shall deliver to Buyer, with copies to each additional insured identified in these Supplementary Conditions, certificates of insurance (and other evidence requested by Buyer or any other additional insured) which Seller is required to purchase and maintain.

4.02.J. If Buyer has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained on the basis of nonconformance with the Contract Documents, Buyer shall notify Seller in writing within 10 days after receipt of the certificates or other evidence required by Paragraph SC-4.02.K. Seller shall provide such additional information in respect to insurance as Buyer shall reasonably request.

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

5.03.D. While not intended to be inclusive of all Laws or Regulations for which Seller may be responsible under Paragraph 5.03, the following Laws or Regulations are included as mandated:

5.03.D.1. Build America, Buy America (BABA) Requirements:

5.03.D.1.a. The Seller shall comply with all applicable requirements of the BABA, Title IX of Division G of the Infrastructure Investment and Jobs Act (Public Law 117-58), and all applicable implementing regulations, guidance, and agency requirements.

5.03.D.1.b. The Seller certifies that all iron, steel, manufactured products, and construction materials furnished under this Contract, to the extent subject to BABA requirements, are produced in the United States.

5.03.D.1.f. The Seller shall be solely responsible for ensuring that all subcontractors, suppliers, manufacturers, and lower-tier vendors comply with the requirements of the BABA and all related Contract Documents. The Seller shall incorporate applicable BABA requirements into all subcontracts, purchase orders, supply agreements, and other procurement documents associated with the Work. Any failure of a subcontractor, supplier,

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manufacturer, or lower-tier vendor to comply with BABA requirements shall not relieve the Seller of its obligations under the Contract.

5.03.D.1.g. Bidders shall provide BABA Initial Certification Statement included in *Part 1 – Bidding Requirements* with their Bid.

5.03.D.1.h. Seller shall provide BABA Final Certification Statement included in Section 01 43 34, Special Services, at the conclusion of the Project.

SC-5.08. Replace Paragraph 5.08.E. in its entirety with the following:

SC-5.08.E. This warranty shall commence upon delivery of the Goods and shall expire 60 months from the date of acceptance of the Goods and Special Services by Buyer. If during the Warranty Period Buyer discovers a defect in design, material or workmanship of a Good, Buyer shall promptly notify Seller of any breach and Seller will, at its option, either deliver to Buyer, on the same terms as the original delivery was made, a replacement part or repair the defect in place. Any repair or replacement part furnished pursuant to this warranty is warranted against defects in design, material, and workmanship for the longer of the expiration of the Warranty Period, or 36 months after the completion of such repair or replacement, with no further extension. If any failure to meet this warranty appears within 12 months from the date of completion of the Special Services, on the condition that Seller be promptly notified in writing thereof, Seller, as its sole obligation for breach of this warranty, will correct the failure by re-performing any defective portion of the Special Services furnished. If within a reasonable period after Buyer notifies Seller of a defect in the Goods, Seller has not started to repair or arrange for replacement of the Goods, Buyer may make the repairs or have a third party make such repairs, and the direct cost of the repairs shall be paid by Seller.

SC-5.08. Delete Paragraph 5.08.F. in its entirety.

SC-13.02. Add the following new paragraph immediately after Paragraph 13.01:

SC13.02. Dispute Resolution Process:

13.02.A. Applicability:

13.02.A.1. Notwithstanding any other provision of the Contract Documents, Seller Claims subject to California Public Contract Code Section 9204 shall be resolved in accordance with this Paragraph SC-13.02.

13.02.A.2. Compliance with this Paragraph SC-13.02 is a condition precedent to litigation of any Claim governed by Public Contract Code Section 9204.

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13.02.B. Claim Submission:

13.02.B.1. Seller shall submit Claims in writing by registered mail or certified mail, return receipt requested.

13.02.B.2. Each Claim shall include reasonable documentation supporting:

13.02.B.2.a. The factual basis for the Claim.

13.02.B.2.b. Contract provisions relied upon.

13.02.B.2.c. Amount of compensation requested.

13.02.B.2.d. Time extension requested, if any.

13.02.B.2.e. Computations and supporting records.

13.02.B.3. Seller shall continue performance of the Work pending resolution of any Claim.

13.02.C. Buyer Review:

13.02.C.1. Within forty-five (45) days following receipt of the Claim, Buyer shall conduct a reasonable review and provide a written statement identifying the disputed and undisputed portions of the Claim.

13.02.C.2. Buyer may request additional supporting documentation necessary for evaluation of the Claim.

13.02.C.3. If additional documentation is requested, Buyer shall issue its written response within forty-five (45) days after receipt of such documentation, or within another period agreed upon by the parties in writing.

13.02.C.4. Failure of Buyer to issue a timely written response shall be deemed a rejection of the Claim.

13.02.D. Payment of Undisputed Amounts:

13.02.D.1. Any undisputed portion of a Claim shall be paid within sixty (60) days after Buyer's written determination.

13.02.D.2. Any undisputed amount not timely paid shall accrue interest at 7 percent per annum as provided by Public Contract Code Section 9204.

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13.02.E. Meet and Confer Conference:

13.02.E.1. If all or part of a Claim remains disputed, or if Buyer fails to provide a timely response, Seller may submit a written demand for an informal meet-and-confer conference.

13.02.E.2. Buyer shall schedule the conference within thirty (30) days following receipt of the written demand.

13.02.E.3. Within ten (10) days after completion of the conference, Buyer shall provide a written statement identifying any disputed and undisputed portions of the Claim.

13.02.E.4. Any undisputed amount identified following the conference shall be paid within sixty (60) days.

13.02.F. Mediation:

13.02.F.1. If the Claim remains unresolved following the meet-and-confer conference, the parties shall participate in nonbinding mediation.

13.02.F.2. Mediation shall occur within ten (10) business days following the meet-and-confer conference, unless otherwise agreed in writing.

13.02.F.3. Costs of mediation shall be shared equally by Buyer and Seller.

13.02.F. Litigation:

13.02.F.1. Upon completion of the procedures described above, either party may pursue available judicial remedies.

13.02.F.2. Nothing in this this Paragraph SC-13.02 alters statutes of limitation or other requirements imposed by applicable law.

END OF SECTION

PART 3

SPECIFICATIONS

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SECTION 01 11 19
PURCHASE CONTRACTS

PART 1 GENERAL

1.01 LOCATION

- A. The Project Site is located near the Red Bluff Diversion Dam on the Sacramento River in Tehama County, California, approximately 2 miles southeast of the City of Red Bluff. The Project Site is located near the Red Bluff office of the Tehama-Colusa Canal Authority at 22500 Altube Avenue, Red Bluff, CA 96080.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. Summary of Goods:
1. The Goods to be furnished under this Contract are described in Section 26 19 00, Medium-Voltage Induction Motors, Section 40 27 02, Process Valves and Actuators, and Section 44 42 56.23, Vertical Axial-Flow Pumps, consisting of the following:
 - a. Furnishing induction motors.
 - b. Furnishing butterfly valves and actuator assemblies.
 - c. Furnishing vertical axial-flow pumps and miscellaneous components.
 - d. Delivering items F.O.B. to the Point of Destination.
- B. Summary of Special Services: The Special Services to be furnished under this Contract are described in Section 01 43 34, Special Services, and consists of providing services of manufacturer's installation representatives to oversee installation of pumping units (pumps and motors) and butterfly valves and actuator assemblies.

1.03 SUMMARY OF CONTRACTS

- A. Goods furnished and delivered under this Contract will be erected and installed by a single Contractor, under separate contract with Buyer, at the Red Bluff Pumping Plant.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 26 01
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 CONTRACT MODIFICATION PROCEDURES

A. Proposal Request:

1. Buyer may, in anticipation of ordering an addition, deletion, or revision to the Goods or Special Services, request Seller to prepare a detailed proposal of cost and times to perform contemplated change.
2. Proposal request will include reference number for tracking purposes and detailed description of and reason for proposed change, and such additional information as appropriate and as may be required for Seller to accurately estimate cost and time impact on Project.
3. Proposal request is for information only; Seller is neither authorized to execute proposed change nor to stop work in progress as result of such request.
4. Seller's written proposal shall be transmitted to Engineer promptly, but not later than 14 days after Seller's receipt of Buyer's written request. Proposal shall remain firm for a maximum period of 45 days after receipt by Engineer.
5. Buyer's request for proposal or Seller's failure to submit such proposal within required time period will not justify a claim for an adjustment in Contract Price or Contract Times (or Milestones).

B. Change Orders:

1. Procedure:
 - a. Engineer will prepare one electronic copy of proposed Change Order and transmit such with Engineer's written recommendation (Change Order only) and request to Seller for signature.
 - b. Seller shall, upon receipt, either: (i) promptly sign and return to Engineer for Buyer's signature, or (ii) return unsigned with written justification for not executing Change Order.
 - c. Engineer will, upon receipt of Seller signed copy, promptly forward Engineer's written recommendation and partially executed copy for Buyer's signature, or if Seller fails to execute Change Order, Engineer will promptly so notify Buyer and transmit Seller's justification to Buyer.

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- d. Upon receipt of Seller-executed Change Order, Buyer will promptly either:
 - 1) Execute Change Order, retaining one copy for its file and returning one electronic copy to Engineer, or
 - 2) Return to Engineer unsigned with written justification for not executing Change Order.
- e. Upon receipt of Buyer-executed Change Order, Engineer will transmit an electronic copy to Seller, or if Buyer fails to execute Change Order, Engineer will promptly so notify Seller and transmit Buyer's justification to Seller.
- f. Upon receipt of Buyer-executed Change Order, Seller shall:
 - 1) Perform work covered by Change Order.
 - 2) Revise progress schedule to reflect changes in Contract Times, if any, and to adjust times for other items of Project affected by change.
- 2. In signing a Change Order, Buyer and Seller acknowledge and agree that:
 - a. Stipulated compensation (Contract Price or Contract Times, or both) set forth includes payment for (i) cost of the work covered by Change Order, (ii) Seller's fee for overhead and profit, (iii) interruption of progress schedule, (iv) delay and impact, including cumulative impact, on other work under the Contract Documents, and (v) extended overheads.
 - b. Change Order constitutes full mutual accord and satisfaction for the change to the Goods or Special Services.
 - c. Unless otherwise stated in Change Order, all requirements of the original Contract Documents apply to the Goods or Special Services covered by Change Order.

C. Work Change Directive:

- 1. Engineer will:
 - a. Initiate, including a description of the Work involved and any attachments.
 - b. Affix signature, demonstrating Engineer's recommendation.
 - c. Transmit an electronic copy to Owner for authorization.
- 2. Owner will:
 - a. Affix signature, demonstrating approval of the changes involved.
 - b. Return an electronic copy to Engineer, and to the Resident Project Representative or other field representative, and forward an electronic copy to Contractor.
- 3. Upon completion of Work covered by the Work Change Directive or when final Contract Times and Contract Price are determined, Contractor shall submit documentation for inclusion in a Change Order.

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4. Contractor's documentation shall include but not be limited to:
 - a. Appropriately detailed records of Work performed to enable determination of value of the Work.
 - b. Full information required to substantiate resulting change in Contract Times and Contract Price for Work. On request of Engineer, provide additional data necessary to support documentation.
 - c. Support data for Work performed on a unit price or Cost of the Work basis with additional information such as:
 - 1) Dates Work was performed, and by whom.
 - 2) Time records, wage rates paid, and equipment rental rates.
 - 3) Invoices and receipts for materials, equipment, and subcontracts, all similarly documented.
5. Effective Date of Work Change Directive: Date of signature by Owner, unless otherwise indicated thereon.

1.02 CLAIMS

A. Include, at a minimum:

1. Specific references including (i) Drawing numbers, (ii) Specification section and article/paragraph number, and (iii) Submittal number, date reviewed, Engineer's comment, as applicable, with appropriate attachments.
2. Stipulated facts and pertinent documents, including photographs and statements.
3. Interpretations relied upon.
4. Description of (i) nature and extent of claim, (ii) who or what caused situation, (iii) impact to work and work of others, and (iv) discussion of claimant's justification for requesting change to price or times or both.
5. Estimated adjustment in price claimant believes it is entitled to with full documentation and justification.
6. Requested Change in Contract Times: Include at least (i) progress schedule documentation showing logic diagram for request, (ii) documentation that float times available for work have been used, and (iii) revised activity logic with durations including sub-network logic revisions, duration changes, and other interrelated schedule impacts, as appropriate.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by Seller that requires Engineer's approval.
- B. Informational Submittal: Information submitted by Seller that does not require Engineer's approval.
- C. Preliminary Operation and Maintenance (O&M) Data: Initial and subsequent submissions for Engineer's review.
- D. Final O&M Data: Engineer-accepted data, submitted as specified herein.
- E. Maintenance Operation: As used on Maintenance Summary Form is defined to mean any routine operation required to ensure satisfactory performance and longevity of Goods. Examples of typical maintenance operations are cleaning, lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.

1.02 PROJECT COORDINATION

- A. Onsite Coordination:
 - 1. Buyer will coordinate the activities at the Point of Destination related to the Goods furnished under this Contract.
 - 2. Seller shall fully coordinate its activities with Buyer and other contractors. This includes promptly bringing to Buyer's attention any conflict or coordination problem.

1.03 CONTRACT PROGRESS REPORTING

- A. Progress Schedule:
 - 1. Bar chart schedule demonstrating Seller's plan for fulfilling Contract requirements.
 - 2. Information shall be comprehensive and shall represent all activities, including submittals and procurement necessary to complete Contract.
 - 3. Typical minimum detail on the schedule shall include, but not be limited to, the following:
 - a. Delivery date(s) of Shop Drawings and Sample submittals.

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- b. Delivery date(s) of Operation and Maintenance Data.
 - c. Date Seller places purchase orders with major subcontractors and suppliers.
 - d. Date Seller orders castings and forgings.
 - e. Date of starting assembly of specified Goods.
 - f. Date of finishing assembly of specified Goods.
 - g. Date of testing at plant.
 - h. Date or ready to ship.
 - i. Date of shipment from Seller.
 - j. Date of arrival at Point of Destination.
 - k. Special Services.
- 4. Assist Engineer in determining the most current schedule information on the Contract items, including whether Seller is on schedule or delayed. These requirements apply fully to telephone inquiries, personal visits, letters, or other communication.
 - 5. Submit Notice of Schedule Impact at any time that a Progress Schedule activity is delayed by 5 or more days.
 - a. Complete and submit to party named on the form attached.
 - b. Transmit completed form either in facsimile, e-mail, or mail via registered overnight mail service.

1.04 SUBMITTAL PROCEDURES

- A. Direct submittals to Buyer and Engineer at the following address, unless specified otherwise:
 - 1. Attn:
Aaron Hall/TCCA, ahall@tccanal.com
Diana Dore/JACOBS, diana.dore@jacobs.com
Brad Memeo/JACOBS, brad.memeo@jacobs.com
- B. Electronic Submittals: Submittals shall, unless specifically accepted, be made in electronic format.
 - 1. Each submittal shall be an electronic file in Adobe Acrobat Portable Document Format (PDF). Use the latest version available at time of execution of the Agreement.
 - 2. Electronic files that contain more than 10 pages in PDF format shall contain internal book marking from an index page to major sections of the document.
 - 3. PDF files shall be set to open "Bookmarks and Page" view.
 - 4. Add general information to each PDF file, including title, subject, author, and keywords.

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5. PDF files shall be set up to print legibly at 8.5-inch by 11-inch, 11-inch by 17-inch, or 22-inch by 34-inch. No other paper sizes will be accepted.
6. Submit new electronic files for each resubmittal.
7. Include a copy of the Transmittal of Contractor's Submittal form, located at end of section, with each electronic file.
8. Provide Engineer with authorization to reproduce and distribute each file as many times as necessary for Project documentation.

C. Transmittal of Submittal:

1. Review each submittal and check for compliance with Contract Documents.
2. Stamp each submittal with uniform approval stamp before submitting; stamp to include Project name, submittal number, Specification number, Seller's reviewer name, date of Seller's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract Documents. Engineer will not review submittals that do not bear Seller's certification as required by the General Conditions and will return them without action.
3. Complete, sign, and transmit with each submittal package, one Transmittal of Seller's Submittal form attached at end of this section.
4. Identify each submittal with the following:
 - a. Numbering and Tracking System:
 - 1) Sequentially number each submittal.
 - 2) Resubmission of submittal shall have original number with sequential alphabetic suffix.
 - b. Specification section and paragraph to which submittal applies.
 - c. Project title and Engineer's project number.
 - d. Date of transmittal.
 - e. Names of Seller, Subcontractor or Supplier, and manufacturer as appropriate.
5. Identify and describe each deviation or variation from Contract Documents.

D. Format:

1. Do not base Shop Drawings on reproductions of Contract Documents.
2. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.
3. Index with labeled tab dividers in orderly manner.

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- E. Timeliness of Submittal: Schedule and submit in accordance with the Seller's Progress Schedule, and requirements of individual Specification sections.
- F. Processing Time:
 - 1. Time for review shall commence on Engineer's receipt of submittal.
 - 2. Engineer will act upon Seller's submittal and transmit response to Seller not later than 20 days after receipt, unless otherwise specified.
 - 3. Resubmittals will be subject to same review time.
 - 4. No adjustment of Contract Times or Price will be allowed due to delays in providing Goods or Special Services caused by rejection and subsequent resubmittals.
- G. Resubmittals: Clearly identify each correction or change made.
- H. Incomplete Submittals:
 - 1. Engineer will return entire submittal for Seller's revision if preliminary review deems it incomplete.
 - 2. When any of the following are missing, submittal will be deemed incomplete:
 - a. Seller's certification as required by the General Conditions.
 - b. Transmittal of Seller's Submittal, completed and signed.
- I. Submittals not required by Contract Documents: Will not be reviewed and will be returned stamped "Not Subject to Review."
- J. Action Submittals:
 - 1. Prepare and submit as required by individual Specification sections.
 - 2. Shop Drawings:
 - a. Identify and Indicate:
 - 1) Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.
 - 2) Goods and Component Title: Identical to title shown on Drawings.
 - 3) Critical field dimensions and relationships to other critical features. Note dimensions established by field measurement.
 - 4) Project-specific information drawn accurately to scale.
 - b. Manufacturer's standard schematic drawings and diagrams as follows:
 - 1) Modify to delete information that is not applicable.
 - 2) Supplement standard information to provide information specifically applicable.

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- c. Product Data: Provide as specified in individual Specifications.
- d. BABA Compliance Documentation.

K. Action Submittal Dispositions: Engineer will review, mark, and stamp as appropriate, and distribute marked-up copies as noted:

- 1. Approved:
 - a. Seller may provide Goods or Special Services covered by submittal.
 - b. Distribution: Electronic.
- 2. Approved as Noted:
 - a. Seller may provide Goods or Special Services covered by submittal, in accordance with Engineer's notations.
 - b. Distribution: Electronic.
- 3. Partial Approval, Resubmit as Noted:
 - a. Make corrections or obtain missing portions, and resubmit.
 - b. Except for portions indicated, Seller may begin to provide Goods or Special Services covered by submittal, in accordance with Engineer's notations.
 - c. Distribution: Electronic.
- 4. Revise and Resubmit:
 - a. Seller may not provide Goods or Special Services covered by submittal.
 - b. Make corrections and resubmit.
 - c. Distribution: Electronic.

L. Informational Submittals:

- 1. Copies: Electronic.
- 2. Refer to individual Specification sections for specific submittal requirements.
- 3. Engineer will review each submittal. If submittal meets conditions of the Contract, Engineer will forward submittal to appropriate parties. If Engineer determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, Engineer will return with review comments to Seller, and require that submittal be corrected and resubmitted.

1.05 OPERATION AND MAINTENANCE (O&M) DATA

A. Format and Scheduling:

- 1. Preliminary Data:
 - a. Format: Instructional Manual.

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- b. Submit subsequent to Engineer approval of Shop Drawings, but prior to shipment date.
 - c. Submit in Electronic Media Format.
- 2. Final Data:
 - a. Submit at the time of shipment of Goods.
 - b. Submit in Electronic Media Format and three hard copies.

B. Instructional Manual Format:

- 1. Binder: Commercial quality, permanent, three-ring or three-post binders with durable plastic cover.
- 2. Size: 8-1/2 inches by 11 inches, minimum.
- 3. Cover:
 - a. Identify manual with typed or printed title "OPERATION AND MAINTENANCE DATA" and list:
 - 1) Project title.
 - 2) Designate applicable system, equipment, material, or finish.
 - 3) Identity of separate structure as applicable.
 - 4) Identity of general subject matter covered in manual.
 - 5) Identity of equipment number, if applicable, and Specification section.
- 4. Title Page:
 - a. Seller's name, address, and telephone number.
 - b. Subcontractor, supplier, or maintenance contractor's name, address, and telephone number, as appropriate.
 - 1) Identify area of responsibility of each.
 - 2) Provide name and telephone number of local source of supply for parts and replacement.
- 5. Table of Contents:
 - a. Neatly typewritten and arranged in systematic order with consecutive page numbers.
 - b. Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
- 6. Paper: 20-pound minimum, white for typed pages.
- 7. Text: Manufacturer's printed data, or neatly typewritten.
- 8. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
- 9. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs.

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C. Electronic Media Format:

1. Portable Document Format (PDF):
 - a. After all preliminary data has been found to be acceptable to Engineer, submit Operation and Maintenance data in PDF format.
 - b. Files to be exact duplicates of Engineer-accepted preliminary data. Arrange by specification number and name.
 - c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.

D. Data Content:

1. Product Data:
 - a. Include only those sheets that are pertinent to specific product.
 - b. Clearly annotate each sheet to:
 - 1) Identify specific product or part installed.
 - 2) Identify data applicable to installation.
 - 3) Delete references to inapplicable information.
 - c. Function, normal operating characteristics, and limiting conditions.
 - d. Performance curves, engineering data, nameplate data, and tests.
 - e. Complete nomenclature and commercial number of replaceable parts.
 - f. Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.
 - g. Spare parts ordering instructions.
 - h. Where applicable, identify installed spares and other provisions for future work (for example, reserved panel space, unused components, wiring, terminals).
2. Color-coded piping diagrams.
3. Charts of valve tag numbers, with the location and function of each valve.
4. Drawings: Supplement product data with Drawings as necessary to clearly illustrate:
 - a. Format:
 - 1) Provide reinforced, punched, binder tab; bind in with text.
 - 2) Reduced to 8-1/2 inches by 11 inches, or 11 inches by 17 inches folded to 8-1/2 inches by 11 inches.
 - 3) Where reduction is impractical, fold and place in 8-1/2 inch by 11-inch envelopes bound in text.
 - 4) Identify Specification section and product on Drawings and envelopes.

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- b. Relations of component parts of equipment and systems.
 - c. Control and flow diagrams.
 - d. Coordinate drawings with Project record documents to assure correct illustration of completed installation.
 - 5. Instructions and Procedures: Within text, as required to supplement product data.
 - a. Format:
 - 1) Organize in consistent format under separate heading for each different procedure.
 - 2) Provide logical sequence of instructions for each procedure.
 - 3) Provide information sheet for Buyer's personnel, including:
 - a) Proper procedures in event of failure.
 - b) Instances that might affect validity of guarantee or Bond.
 - b. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
 - c. Operating Procedures:
 - 1) Startup, break-in, routine, and normal operating instructions.
 - 2) Test procedures and results of factory tests where required.
 - 3) Regulation, control, stopping, and emergency instructions.
 - 4) Description of operation sequence by control manufacturer.
 - 5) Shutdown instructions for both short and extended duration.
 - 6) Summer and winter operating instructions, as applicable.
 - 7) Safety precautions.
 - 8) Special operating instructions.
 - d. Maintenance and Overhaul Procedures:
 - 1) Routine maintenance.
 - 2) Guide to troubleshooting.
 - 3) Disassembly, removal, repair, reinstallation, and re-assembly.
- E. Content for Each Electric or Electronic Item or System:
- 1. Description of Unit and Component Parts:
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, nameplate data, and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 - d. Interconnection wiring diagrams, including control and lighting systems.

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2. Circuit Directories of Panelboards:
 - a. Electrical service.
 - b. Controls.
 - c. Communications.
 3. List of electrical relay settings and control and alarm contact settings.
 4. Electrical interconnection wiring diagram, including control and lighting systems.
 5. Operating Procedures:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Safety precautions.
 - d. Special operating instructions.
 6. Maintenance Procedures:
 - a. Routine maintenance.
 - b. Guide to troubleshooting.
 - c. Adjustment and checking.
 - d. List of relay settings, control and alarm contact settings.
 7. Manufacturer's printed operating and maintenance instructions.
 8. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- F. Maintenance Summary:
1. Compile individual Maintenance Summary for each applicable item, respective unit or system, and for components or sub-units.
 2. Format:
 - a. Use Maintenance Summary Form bound with this section or electronic facsimile of such.
 - b. Each Maintenance Summary may take as many pages as required.
 - c. Use only 8-1/2 inch by 11-inch size paper.
 - d. Complete using electronic form provided by Engineer.
 3. Include detailed lubrication instructions and diagrams showing points to be greased or oiled; recommend type, grade, and temperature range of lubricants and frequency of lubrication.
 4. Recommended Spare Parts:
 - a. Data to be consistent with manufacturer's Bill of Materials/Parts List furnished in O&M manuals.
 - b. "Unit" is the unit of measure for ordering the part.
 - c. "Quantity" is the number of units recommended.
 - d. "Unit Cost" is the current purchase price.

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1.06 SUPPLEMENTS

A. The supplements listed below, following “End of Section”, are part of this Specification:

1. Notice of Schedule Impact.
2. Transmittal of Seller’s Submittal Form.
3. Maintenance Summary Form.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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NOTICE OF SCHEDULE IMPACT

(Send this form as addressed if delay is over 5 days. Send via e-mail)

To: Tehama-Colusa Canal Authority
Attention: Bill Vanderwaal
Address: 5513 Highway 162, Willows, CA 95988
E-mail: wvanderwaal@tccanal.com

RE: Contract No.: _____
Name of Contract: _____
Type of Goods: _____
Nature of Delay: _____
New Estimated Date for Final Shop Drawings: _____
New Estimated Date for Start of Manufacture: _____
New Estimated Date for Finish of Manufacture: _____
New Estimated Date for Shipment: _____
New Estimated Date for Arrival at Point of Destination: _____

SELLER:

Name: _____
Address: _____
City: _____ State: _____ Zip: _____ Telephone: _____
E-mail: _____
By (Name/Title): _____ Date: _____

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TRANSMITTAL OF SELLER'S SUBMITTAL
(ATTACH TO EACH SUBMITTAL)

Date: _____

TO: _____

Aaron Hall, ahall@tccanal.com

Diana Dore, diana.dore@jacobs.com

Brad Memeo, brad.memeo@jacobs.com

FROM: _____

Seller

Submittal No.: _____

☐ New Submittal ☐ Resubmittal

Project: Red Bluff Pumping Plant Improvements

Project No.: D3317602

Specification Section No.: _____

(Cover only one section with each transmittal)

Schedule Date of Submittal: _____

SUBMITTAL TYPE: ☐ Shop Drawing

☐ Sample

☐ Informational

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

SELLER hereby certifies that (i) SELLER has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: _____

SELLER (Authorized Signature)

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RED BLUFF PUMPING PLANT IMPROVEMENTS

MAINTENANCE SUMMARY FORM

PROJECT: Red Bluff Pumping Plant Improvements CONTRACT NO.: _____

1. ITEM _____

2. MANUFACTURER _____

3. TAG NUMBER(S) _____

4. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS) _____

5. NAMEPLATE DATA (hp, voltage, speed, etc.) _____

6. SELLER'S LOCAL REPRESENTATIVE _____

a. Name _____ Telephone No. _____

b. Address _____

7. MAINTENANCE REQUIREMENTS

Maintenance Operation Comments	Frequency	Lubricant (If Applicable)
List briefly each maintenance operation required and refer to specific information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable.)	List required frequency of each maintenance operation.	Refer by symbol to lubricant required.

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8. LUBRICANT LIST

Reference Symbol	Shell	Standard Oil	Gulf	Arco	Or Equal
List symbols used in No. 7 above.	List equivalent lubricants, as distributed by each manufacturer for specific use recommended.				

9. RECOMMENDED SPARE PARTS FOR BUYER'S INVENTORY

Part No.	Description	Unit	Quantity	Unit Cost
Note: Identify parts provided by this Contract with two asterisks.				

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 BUYER'S QUALITY ASSURANCE

- A. All Work is subject to Buyer's quality assurance inspection and testing at all reasonable times before acceptance to ensure strict compliance with the terms of the Contract Documents.
- B. Buyer's quality assurance inspections and tests are for the sole benefit of Buyer and do not:
 - 1. Relieve Seller of responsibility for providing adequate quality control measures;
 - 2. Relieve Seller of responsibility for damage to or loss of the material before acceptance;
 - 3. Constitute or imply acceptance; or
 - 4. Affect the continuing rights of Buyer after acceptance of the completed Work.
- C. The presence or absence of a quality assurance inspector does not relieve Seller from any Contract requirement.
- D. Promptly furnish all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by Engineer.

1.02 QUALITY CONTROL

- A. Source Quality Control: Where specified for Goods, factory test results shall be reviewed and accepted before such Goods are shipped.
- B. Field Quality Control: Provide as specified in individual specifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01 43 34
SPECIAL SERVICES**

PART 1 GENERAL

1.01 DEFINITIONS

- A. Functional Testing: Tests necessary to demonstrate that installed Goods function as specified and operate in the manner intended. Functional testing is a prerequisite to performance testing for Goods specified to have a performance test.
- B. Performance Testing: Tests necessary to demonstrate, after successful functional testing, that Goods meet specified performance requirements.
- C. Installing Contractor: The entity, under separate contract with the Buyer, whose responsibilities include the installation of the Goods provided under this Contract.

1.02 MANUFACTURER'S REPRESENTATIVE

- A. Where Special Services are specified, Seller shall furnish a qualified representative of manufacturer.
- B. If manufacturer's representative is found deficient in training or experience by Buyer or Engineer, furnish replacement representative after acceptance of resume and other qualification documentation of proposed representative.
- C. BABA Final Compliance Certification Statement.

1.03 COMMISSIONING ASSISTANCE

- A. Functional Testing: Where specified, assist installing contractor in performing functional (or run) testing of furnished Goods. Furnish representative to assist with test and necessary adjustments.
- B. Performance Testing: Where specified, assist installing contractor in conducting performance testing of furnished Goods. Furnish representative to assist with tests as specified for the particular Goods and to correct malfunctions.

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- C. Startup Assistance: Where specified, furnish representative to assist installing contractor with startup of furnished Goods.
 - 1. Furnish labor and materials, tools, instruments, and services for checking, testing, and startup specified.
 - 2. Develop a standard record of testing:
 - a. This record shall:
 - 1) Be subject to approval of Engineer.
 - 2) Include name of Goods and subsystem, if applicable.
 - 3) Have provisions for recording dates of completion for checking, inspection by manufacturer, verification of instrumentation and controls, and completion of subsystem tests.
 - 4) Allow space for describing problems remaining with Goods, and for signature of Engineer indicating acceptance.

1.04 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

- A. When so specified, a Manufacturer's Certificate of Proper Installation form, a copy of which is attached to this section, shall be completed and signed by Seller's representative.
- B. Such form shall certify signing party is a duly authorized representative of Seller, is empowered by Seller to inspect, approve, and operate their Goods and is authorized to make recommendations required to ensure that the Goods are complete and operational.

1.05 DEMONSTRATION AND TRAINING

- A. Where specified, furnish Seller's representative to instruct Buyer's personnel in proper operation and maintenance techniques for the furnished Goods.
- B. Training services may include classroom or onsite instruction, either prestartup or post-startup, as stated in the Specifications.
- C. Prestartup Training:
 - 1. Prestartup training shall be completed at least 5 days prior to actual startup.
 - 2. Operation and Maintenance Data shall be reviewed and accepted before initiation of prestartup training.
- D. Post-Startup Training: Furnish and coordinate specified manufacturers' services and Seller's personnel for post-startup training of Buyer's operating personnel.

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PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUPPLEMENTS

- A. The supplements listed below, following “End of Section”, are part of this Specification.
1. Manufacturer’s Certificate of Proper Installation.
 2. Build America, Buy America (BABA) Final Certification Statement.

END OF SECTION

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MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

BUYER: Tehama-Colusa Canal Authority EQPT SERIAL NO: _____

EQPT TAG NO: _____ EQPT/SYSTEM: _____

PROJECT NO: D3317602 SPEC. SECTION: _____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- ☐ Installed in accordance with manufacturer's recommendations.
- ☐ Inspected, checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ Functional tests.
- ☐ System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.

Comments: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate its equipment and (iii) authorized to make recommendations required to ensure that the Goods furnished by the Seller are complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____, 20____

Seller: _____

Manufacturer's Authorized Representative: _____
(Authorized Signature)

BUILD AMERICA, BY AMERICA (BABA) ACT FINAL CERTIFICATION STATEMENT

Upon execution of this certification, the selected Contractor, Subcontractor, Materials Supplier, or Service Provider hereby certifies that all of the iron, steel, manufactured products, and construction materials used in the Project were produced in the United States or appropriate waiver(s) have been approved by the U.S. Environmental Protection Agency and that no changes or substitutions to the individual certifications provided by the contractor were made.

This statement relates to a proposed contract between _____
(contractor)

and _____ or between
(owner)

_____ and _____
(subcontractor) (contractor)

in conjunction with _____
(project name)

to be funded with monies from a federal assistance agreement.

Signature Date

Name and Title of Signer (Please type)

SECTION 01 45 36
EQUIPMENT SEISMIC CERTIFICATION

PART 1 GENERAL,

1.01 SUMMARY

- A. This section covers the code required seismic certification of mechanical and electrical equipment in accordance with 2025 CBC, Chapter 17.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Society of Civil Engineers (ASCE): 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
 - 2. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - a. 344, Standard for Seismic Qualification of Equipment for Nuclear Power Generating Stations.
 - 3. International Code Council (ICC):
 - a. California Building Code (CBC).
 - b. Evaluation Service (ICC-ES) Reports and Legacy Reports.

1.03 DEFINITIONS

- A. Agencies and Personnel:
 - 1. Approved Agency: An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved.
- B. Component Supports:
 - 1. Electrical: Structural members or assemblies which transmit loads and forces from electrical equipment to the structure, including braces, frames, legs, pedestals, and tethers, as well as elements forged or cast as part of component for anchorage.
 - 2. Mechanical: Structural members or assemblies which transmit loads and forces from mechanical equipment to the structure, including braces, frames, skirts, legs, saddles, pedestals, snubbers, and tethers, as well as elements forged or cast as part of component for anchorage.

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1.04 SUBMITTALS

A. Informational Submittals:

1. Seismic Qualification of Mechanical and Electrical Equipment
Certification of Compliance: Submit for mechanical and electrical components having a component importance factor of 1.5 as designated herein. Submit for other components having component importance factor of 1.0 where test results are submitted as an alternate to required calculations under 13.2.6 of ASCE 7-22. Refer to Article Supplements located at end of section.
2. If required by Engineer, submit documentation of testing results or analytical data.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 MECHANICAL AND ELECTRICAL COMPONENT CERTIFICATION

- A. Provide certificate of compliance for mechanical and electrical component testing and certification on form located at end of section. Provide certificates for equipment and components listed in the following table:

Mechanical and Electrical Components Requiring Certification of Compliance for Seismic Testing or Analysis under CBC Section 1705.14.2			
Facility	Component	Component Importance Factor, I_p	Component to Remain Operable?
Pumping Plant	Vertical Axial Flow Pumps	1.0	Yes

- B. Certify mechanical and electrical components listed in table above on basis of tests on a shaking table, by three-dimensional shock tests, by an analytical method using dynamic characteristics of mapped accelerations and forces calculated per ASCE 7-22 Chapter 13, by experience data demonstrating acceptable seismic performance, or by more rigorous analysis. Submitted testing and experience data shall meet requirements of ASCE 7-22 Section 13.2.6 and 13.2.7, respectively.
- C. Seismic testing and certification is in addition to functional and performance testing required for new equipment for field quality control or startup testing as indicated in technical specification.

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- D. Where equipment is required to remain operable following the design earthquake ground motion, active parts or energized components shall be certified on basis of approved shake table testing or experience only unless demonstrably similar to other equipment so qualified.

3.02 SUPPLEMENTS

- A. The supplement listed below, following “End of Section,” is a part of this Specification:
 - 1. Seismic Qualification of Mechanical and Electrical Equipment Certificate of Compliance.

END OF SECTION

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**SEISMIC QUALIFICATION OF MECHANICAL AND ELECTRICAL EQUIPMENT
CERTIFICATE OF COMPLIANCE**

(Component under Certification)

(Name of Manufacturer)

(Tag Number or Equipment ID)

(Business Address)

(Drawing/Detail Number)

(_____)_____
(Telephone)

Section 1705.14.2 of 2025 CBC for seismic qualification of equipment. Basis of qualification is by:

(Check Applicable)

- ☐ Shake-table Test
- ☐ Three-dimensional Shock Test
- ☐ Analytical Method

Qualification shall be based on the modified forces of Section 13.2.3 of ASCE 7-22.

- ☐ Experience Data
- ☐ Other _____

under acceptance criteria of:

- ☐ ICC-ES AC156, Acceptance Criteria for Seismic Qualification by Shake-table Testing of Nonstructural Components
- ☐ IEEE 344, IEEE Standard for Seismic Qualification of Equipment for Nuclear Power Generating Stations for experience data
- ☐ ASCE 7-22 Chapter 13 for analytical methods
- ☐ Other _____

for the following earthquake hazard rating:

Mapped MCE, 5 Percent Damped, Short Period Spectral Response
Acceleration, S_s : _____

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Design, 5 Percent Damped, Short Period Spectral Response
Acceleration, S_{DS} : _____

Component Importance Factor, I_p : _____

$[C_{AR}/R_{po}] = 2.5$

Structure Ductility Reduction Factor, R_μ : 1.3

Height of Point of Attachment as Factor of Average Roof Height,
 z/h : 1.0

This certification covers both the integrity of the equipment and anchorage of equipment. Required mounting and anchorage details are shown on attached Seismic Outline Drawing for the most seismically vulnerable component covered by this certification.

Manufacturer's Representative Signature: _____

Address: _____

Date: _____

SECTION 01 61 01
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 DESIGN REQUIREMENTS

- A. As specified in Section 26 19 00, Medium-Voltage Induction Motors; Section 40 27 02, Process Valves and Actuators; and Section 44 42 56.23, Vertical Axial-Flow Pumps.

1.02 PREPARATION FOR SHIPMENT

- A. Where specified, factory test results shall be reviewed and accepted by Buyer or Engineer before Goods are shipped.
- B. When practical, Goods shall be factory assembled. When impractical:
 - 1. Furnish assembly instructions.
 - 2. Mark or tag the separate parts and assemblies for field assembly.
 - 3. Cover machined and unpainted parts that may be damaged by elements with a strippable protective coating.
- C. Package or crate Goods to provide protection from damage during shipping, handling, and storage.
- D. Marking: Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of project and Seller, equipment number, and approximate weight.
- E. Spare Parts and Special Tools:
 - 1. Deliver at same time as Goods delivery.
 - 2. Mark to identify associated products by name, equipment, and part number.
 - 3. Package parts for protection against damage from elements during shipping, handling, and storage.
 - 4. Ship in boxes or containers marked to indicate contents and as stated above.
- F. Accessories:
 - 1. Deliver at same time as Goods delivery.
 - 2. Furnish accessories required to place each item of equipment in full operation.

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3. Accessories include, but are not limited to, adequate oil and grease as required for first lubrication of equipment (after field testing), light bulbs, fuses, hydrant wrenches, valve keys, chain operators, special tools, and other items as required for initial operation.

1.03 DELIVERY OF GOODS

- A. Notify Buyer, on Seller's Notice of Shipment of Goods form attached to this Section, 15 days prior to shipment of Goods in accordance with Article 6 of General Conditions. Provide all applicable information requested on form.
- B. In accordance with Article 6 of the General Conditions, provide 24-hour telephone notice prior to expected delivery time at the Point of Destination. Notice shall include approximate hour of delivery.
- C. Delivery of Goods shall be made during regular daytime working hours, Monday through Friday, unless other arrangements have been made previously with the Buyer.
- D. Inspection on Delivery:
 1. Buyer or construction contractor will record receipt of Goods at the Point of Destination.
 2. Upon receipt of Goods at the Point of Destination, Buyer, Engineer, and construction contractor will inspect for completeness and evidence of damage during shipment.
 3. Seller may be present for inspection.
 4. Should there appear to be damage, Buyer or Engineer will immediately inform the transportation carrier.
 5. Damaged or incomplete Goods to be returned to Seller for replacement will not be unloaded, except as necessary to expedite return shipment.
 6. Seller shall expedite replacement of damaged, incomplete, or lost items.

1.04 UNLOADING OF GOODS

- A. After acceptance by inspecting party, Goods will be unloaded by construction contractor in accordance with manufacturer's instructions, or as specified.

1.05 SUPPLEMENTS

- A. The supplement listed below, following "End of Section", is part of this Specification:
 1. Seller's Notice of Shipment of Goods.

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PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SELLER'S NOTICE OF SHIPMENT OF GOODS

Delivery of this notice should be via e-mail.

To: _____
Attention: _____
Address: _____

Fax No.: _____
E-mail: _____
RE: Contract No.: _____
Name of Contract: _____
Goods to be Shipped: _____

ATTACH BILL(S) OF LADING FOR ALL SHIPMENTS TO THIS FORM.

Date of Shipment: _____
Manner of Shipment/Name of Carrier: _____
Anticipated Date of Delivery: _____
Special Equipment or Services Required for Unloading/Storage: _____

SELLER:

Name: _____
Address: _____
City: _____ State: _____ Zip: _____ Telephone: _____
E-mail: _____
By (Name/Title): _____ Date: _____

SECTION 09 90 00
PAINTING AND COATING

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
 - a. A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - b. F3125/F3125M, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.
 2. American Water Works Association (AWWA):
 - a. C209, Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.
 - b. C210, Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
 - c. C213, Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
 - d. C214, Tape Coatings for Steel Water Pipelines.
 3. Environmental Protection Agency (EPA).
 4. NACE International (NACE): SP0188, Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
 5. National Association of Pipe Fabricators (NAPF): NAPF 500-03, Surface Preparation Standard for Ductile Iron Pipe and Fittings in Exposed Locations Receiving Special External Coatings and/or Special Internal Linings.
 - a. 500-03-01, Solvent Cleaning.
 - b. 500-03-02, Hand Tool Cleaning.
 - c. 500-03-03, Power Tool Cleaning.
 - d. 500-03-04, Abrasive Blast Cleaning for Ductile Iron Pipe.
 - e. 500-03-05, Abrasive Blast Cleaning for Cast Ductile Iron Fittings.
 6. NSF International (NSF):
 - a. 61, Drinking Water System Components - Health Effects.
 - b. 600, Health Effects Evaluation and Criteria for Chemicals in Drinking Water.
 7. Occupational Safety and Health Act (OSHA).
 8. Research Council on Structural Connections (RCSC): Specification for Structural Joints using High-Strength Bolts.

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9. The Society for Protective Coatings (SSPC):
 - a. Guide 15, Field Methods for Retrieval and Analysis of Soluble Salts on Steel and Other Nonporous Substrates.
 - b. PA 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements.
 - c. PA Guide 10, Guide to Safety and Health Requirements for Industrial Painting Projects.
 - d. SP 1, Solvent Cleaning.
 - e. SP 2, Hand Tool Cleaning.
 - f. SP 3, Power Tool Cleaning.
 - g. SP 5, White Metal Blast Cleaning.
 - h. SP 6, Commercial Blast Cleaning.
 - i. SP 7, Brush-Off Blast Cleaning.
 - j. SP 10, Near-White Metal Blast Cleaning.
 - k. SP 11, Power Tool Cleaning to Bare Metal.
 - l. SP 13, Surface Preparation of Concrete.
 - m. SP 16, Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.02 DEFINITIONS

- A. Coverage: Total minimum dry film thickness in mils or square feet per gallon.
- B. FRP: Fiberglass Reinforced Plastic.
- C. HCl: Hydrochloric Acid.
- D. MDFT: Minimum Dry Film Thickness, mils.
- E. MDFTPC: Minimum Dry Film Thickness per Coat, mils.
- F. Metal: Ferrous metal, carbon steel, or cast/ductile iron. Not stainless steel, galvanized steel, or nonferrous alloys.
- G. Mil: Thousandth of an inch.
- H. PPDS: Paint Product Data Sheet.
- I. PSDS: Paint System Data Sheet.
- J. PVC: Polyvinyl Chloride.
- K. SFPG: Square Feet per Gallon.

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L. SFPGPC: Square Feet per Gallon per Coat.

M. SP: Surface Preparation.

1.03 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. Submit information at least 60 days prior to start of protective coating work.
 - b. Data Sheets:
 - 1) For each product, furnish a Paint Product Data Sheet (PPDS), manufacturer's technical data sheets, and paint colors available (where applicable). PPDS form is appended to end of this section.
 - 2) For each paint system, furnish a Paint System Data Sheet (PSDS). PSDS form is appended to end of this section.
 - 3) Manufacturer's written verification that submitted material is suitable for intended use.
 - 4) Technical and performance information that demonstrates compliance with specification.
 - 5) Furnish copies of paint system submittals to the coating applicator.
 - 6) Indiscriminate submittal of only manufacturer's literature is not acceptable.

B. Informational Submittals:

1. Submit information at least 60 days prior to start of protective coating work.
2. Paint shop QC inspector shall be a NACE certified inspector. Submit resume, including CIP level.
3. Factory Applied Coatings: Manufacturer's certification stating factory applied coating system meets or exceeds requirements specified.
4. If manufacturer of finish coating differs from that of shop primer, provide finish coating manufacturer's written confirmation that materials are compatible.
5. Manufacturer's written instructions and special details for applying each type of paint.

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1.04 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Meet federal, state, and local requirements limiting emission of volatile organic compounds.
2. Perform surface preparation, painting, and waste collection and disposal in accordance with federal, state, and local agencies having jurisdiction.

B. Perform surface preparation and painting in accordance with these specifications, paint manufacturer's written instructions, and SSPC PA Guide 10.

C. Mockup:

1. Before proceeding with Work under this section, finish one complete space or item of each color scheme required showing selected colors, finish texture, materials, quality of work, and special details.
2. After the Engineer's approval, sample spaces or items shall serve as a standard for similar work throughout the Project.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Shipping:

1. Where precoated items are to be shipped to the Site, protect coating from damage. Batten coated items to prevent abrasion.
2. Protect shop-painted surfaces during shipment and handling by suitable provisions including padding, blocking, and use of canvas or nylon slings.

B. Storage:

1. Store products in a protected area that is heated or cooled to maintain temperatures within the range recommended by paint manufacturer.
2. Primed surfaces shall not be exposed to weather for more than 2 months before being topcoated, or less time if recommended by coating manufacturer.

1.06 PROJECT CONDITIONS

A. Environmental Requirements:

1. Do not apply paint in temperatures or moisture conditions outside of manufacturer's recommended maximum or minimum allowable.

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2. Do not perform final abrasive blast cleaning whenever relative humidity exceeds 85 percent, or whenever surface temperature is less than 5 degrees F above dew point of ambient air.

1.07 EXTRA MATERIALS

- A. Provide small quantity kits for touchup painting and for painting other small areas.
- B. Fusion Bonded Coating: Provide appropriate liquid repair kits for field use.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Nationally recognized manufacturers of paints and protective coatings who are regularly engaged in production of such materials for identical service conditions.
- B. Each of the following manufacturers is capable of supplying most of the products specified herein:
 1. 3M Company.
 2. Akzo Nobel.
 3. Carboline.
 4. PPG Industries.
 5. The Sherwin-Williams Company.
 6. Tnemec Company, Inc.

2.02 PAINT MATERIALS

- A. General:
 1. Manufacturer's highest quality products suitable for intended service.
 2. Compatibility: Only compatible materials from a single manufacturer shall be used in the Work. Particular attention shall be directed to compatibility of primers and finish coats.
 3. Thinners, Cleaners, Driers, and Other Additives: As recommended by coating manufacturer.

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B. Products:

Product	Definition
Epoxy Primer— Ferrous Metal	Anticorrosive, converted epoxy primer containing rust-inhibitive pigments
Fusion Bonded Coating	100% solids, thermosetting, fusion bonded, dry powder epoxy, suitable for the intended service, NSF/ANSI/CAN 61 certified
NSF Epoxy	Polyamidoamine epoxy, NSF/ANSI/CAN 61 certified
Polyurethane Enamel	Two-component, aliphatic or acrylic based polyurethane; high gloss finish

2.03 MIXING

A. Multiple-Component Coatings:

1. Prepare using each component as packaged by paint manufacturer.
2. No partial batches will be permitted.
3. Do not use multiple-component coatings that have been mixed beyond their pot life.
4. Furnish small quantity kits for touchup painting and for painting other small areas.
5. Mix only components specified and furnished by paint manufacturer.
6. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

- B. Colors: Formulate paints with colorants free of lead, lead compounds, or other materials that might be affected by presence of hydrogen sulfide or other gas likely to be present at Site.

2.04 SHOP FINISHES

- A. Shop Blast Cleaning: Reference Paragraph Shop Coating Requirements.

B. Shop Coating Requirements:

1. When required by equipment specifications, such equipment shall be primed and finish coated in shop by manufacturer and touched up in field with identical material after installation.
2. Where manufacturer's standard coating is not suitable for intended service condition, the Engineer may approve use of a tie-coat to be used

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between manufacturer's standard coating and specified field finish. In such cases, tie-coat shall be surface tolerant epoxy as recommended by manufacturer of specified field finish coat. Coordinate details of equipment manufacturer's standard coating with field coating manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Factory Finished Items: Repair abraded or otherwise damaged areas on factory-finished items as recommended by coating manufacturer. Carefully blend repaired areas into original finish. If required to match colors, provide full finish coat in field.
- B. Surface Preparation Verification: Inspect and provide substrate surfaces prepared in accordance with these Specifications and printed directions and recommendations of paint manufacturer whose product is to be applied. The more stringent requirements shall apply.

3.02 SURFACE PREPARATION

- A. Steel and Cast-Iron Metal Surface Preparation:
 - 1. Where indicated, meet requirements of SSPC Specifications summarized below:
 - a. SP 1, Solvent Cleaning: Removal of visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants by cleaning with solvent.
 - b. SP 2, Hand Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using nonpower hand tools.
 - c. SP 3, Power Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using power-assisted hand tools.
 - d. SP 5, White Metal Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter by blast cleaning.
 - e. SP 6, Commercial Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 33 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.

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- f. SP 7, Brush-Off Blast Cleaning: Removal of visible rust, oil, grease, soil, dust, loose mill scale, loose rust, and loose coatings. Tightly adherent mill scale, rust, and coating may remain on surface.
 - g. SP 10, Near-White Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 5 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.
 - h. SP 11, Power Tool Cleaning to Bare Metal: Removal of visible oil, grease, dirt, dust, mill scale, rust, paint, oxide, corrosion products, and other foreign matter using power-assisted hand tools capable of producing suitable surface profile. Slight residues of rust and paint may be left in lower portion of pits if original surface is pitted.
 - i. SP 16, Brush Blasting of Non-Ferrous Metals: A brush-off blast cleaned non-ferrous metal surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, metal oxides (corrosion products), and other foreign matter. Intact, tightly adherent coating is permitted to remain. A coating is considered tightly adherent if it cannot be removed by lifting with a dull putty knife. Bare metal substrates shall have a minimum profile of 19 micrometers (0.75 mil).
- 2. The words “solvent cleaning”, “hand tool cleaning”, “wire brushing”, and “blast cleaning”, or similar words of equal intent in these Specifications or in paint manufacturer’s specification refer to the applicable SSPC Specification.
 - 3. Where OSHA or EPA regulations preclude standard abrasive blast cleaning, wet or vacu-blast methods may be required. Coating manufacturers’ recommendations for wet blast additives and first coat application shall apply.
 - 4. Hand tool clean areas that cannot be cleaned by power tool cleaning.
 - 5. Round or chamfer sharp edges and grind smooth burrs, jagged edges, and surface defects.
 - 6. Welds and Adjacent Areas:
 - a. Prepare such that there is:
 - 1) No undercutting or reverse ridges on weld bead.
 - 2) No weld spatter on or adjacent to weld or any area to be painted.
 - 3) No sharp peaks or ridges along weld bead.
 - b. Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead.

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7. Preblast Cleaning Requirements:
 - a. Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.
 - b. Cleaning Methods: Steam, open flame, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.
 - c. Clean small, isolated areas as above or solvent clean with suitable solvent and clean cloth.
8. Blast Cleaning Requirements:
 - a. Type of Equipment and Speed of Travel: Design to obtain specified degree of cleanliness. Minimum surface preparation is as specified herein and takes precedence over coating manufacturer's recommendations.
 - b. Select type and size of abrasive to produce surface profile that meets coating manufacturer's recommendations for particular primer to be used.
 - c. Use only dry blast cleaning methods.
 - d. Do not reuse abrasive, except for designed recyclable systems.
 - e. Meet applicable federal, state, and local air pollution and environmental control regulations for blast cleaning, confined space entry (if required), and disposition of spent aggregate and debris.
9. Post-Blast Cleaning and Other Cleaning Requirements:
 - a. Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapor) air blast cleaning or other method prior to painting. Vacuum clean enclosed areas and other areas where dust settling is a problem and wipe with a tack cloth.
 - b. Paint surfaces the same day they are blasted. Reblast surfaces that have started to rust before they are painted.

3.03 SURFACE CLEANING

A. Solvent Cleaning:

1. Consists of removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by using solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods that involve a solvent or cleaning action.
2. Meet requirements of SSPC SP 1.

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3.04 APPLICATION

A. General:

1. Intention of these Specifications is for new, metal, and submerged metal (ferrous, carbon steel) exterior and interior surfaces to be painted, whether specifically mentioned or not, except as specified otherwise.
2. For coatings subject to immersion, obtain full cure for completed system. Consult coatings manufacturer's written instructions for these requirements. Do not immerse coating until completion of curing cycle.
3. Apply coatings in accordance with these Specifications and paint manufacturers' printed recommendations and special details. In the event of conflicting requirements, the most stringent shall apply. Allow sufficient time between coats to assure thorough drying of previously applied paint.
4. Fusion Bonded Coatings Method Application: Electrostatic, fluidized bed, or flocking.
5. Keep paint materials sealed when not in use.
6. Where more than one coat is applied within a given system, alternate colors to provide a visual reference showing required number of coats have been applied.

B. Film Thickness and Coverage:

1. Number of Coats:
 - a. Minimum required without regard to coating thickness.
 - b. Additional coats may be required to obtain minimum required paint thickness, depending on method of application, differences in manufacturers' products, and atmospheric conditions.
2. Application Thickness:
 - a. Do not exceed coating manufacturer's recommendations.
 - b. Measure using a wet film thickness gauge to ensure proper coating thickness during application.
3. Film Thickness Measurements and Electrical Inspection of Coated Surfaces:
 - a. Perform with properly calibrated instruments.
 - b. Recoat and repair as necessary for compliance with specification.
 - c. Coats are subject to inspection by the Engineer and coating manufacturer's representative.
4. Give particular attention to edges, angles, flanges, and other similar areas, where insufficient film thicknesses are likely to be present, and ensure proper millage in these areas.

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5. Apply additional coats as required to achieve complete hiding of underlying coats. Hiding shall be so complete that additional coats would not increase the hiding.

3.05 PROTECTIVE COATINGS SYSTEMS AND APPLICATION SCHEDULE

A. System No. 1 Submerged Metal:

Surface Prep.	Paint Material	Min. Coats, Cover
Steel: SP 5, White Metal Blast Cleaning	NSF Epoxy	3 coats, 4 MDFTPC

1. Use where specified or indicated on Drawings.

B. System No. 5 Exposed Metal—Mildly Corrosive:

Surface Prep.	Paint Material	Min. Coats, Cover
SP 10, Near-White Blast Cleaning	Epoxy Primer— Ferrous Metal	1 coat, 6 MDFT
	Polyurethane Enamel	1 coat, 3 MDFT

1. Use where specified or indicated on Drawings.

C. System No. 29 Fusion Bonded Coating:

Surface Prep.	Paint Material	Min. Coats, Cover
SP 10, Near-White Blast Cleaning	Fusion Bonded Coating	1 coat min, 12 to 30 DFT

1. Use where specified or indicated on Drawings.

3.06 COLORS

- A. Match existing equipment or as otherwise approved by Owner.

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3.07 SUPPLEMENTS

A. The supplements listed below, following “End of Section,” are a part of this Specification:

1. Paint System Data Sheet (PSDS).
2. Paint Product Data Sheet (PPDS).

END OF SECTION

PAINT SYSTEM DATA SHEET (PSDS)

Complete this PSDS for each coating system, include all components of the system (surface preparation, primer, intermediate coats, and finish coats). Include all components of a given coating system on a single PSDS.

Paint System Number (from Spec.):		
Paint System Title (from Spec.):		
Coating Supplier:		
Representative:		
Surface Preparation:		
Paint Material (Generic)	Product Name/Number (Proprietary)	Min. Coats, Coverage

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PAINT PRODUCT DATA SHEET (PPDS)

Complete and attach manufacturer's Technical Data Sheet to this PPDS for each product submitted. Provide manufacturer's recommendations for the following parameters at temperature (F)/relative humidity:

Temperature/RH	50/50	70/30	90/25
Induction Time			
Pot Life			
Shelf Life			
Drying Time			
Curing Time			
Min. Recoat Time			
Max. Recoat Time			

Provide manufacturer's recommendations for the following:

Mixing Ratio: _____

Maximum Permissible Thinning: _____

Ambient Temperature Limitations: min.: _____ max.: _____

Surface Temperature Limitations: min.: _____ max.: _____

Surface Profile Requirements: min.: _____ max.: _____

SECTION 26 19 00
MEDIUM-VOLTAGE INDUCTION MOTORS

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Bearing Manufacturers Association (ABMA).
2. American Petroleum Institute (API):
 - a. 541, Form-Wound Squirrel-Cage Induction Motors—500 Horsepower and Larger.
 - b. 670, Vibration, Axial Position, and Bearing Temperature Monitoring Systems.
3. Institute of Electrical and Electronics Engineers (IEEE):
 - a. 43, Recommended Practice for Testing Insulation Resistance of Rotating Machinery.
 - b. 112, Standard Test Procedures for Polyphase Induction Motors and Generators.
4. National Electronics Manufacturers Association (NEMA): MG 1, Motors and Generators.

1.02 DEFINITIONS

- A. CT: Current Transformer.
- B. IPS RMS: Inches Per Second, Root Mean Squared.
- C. PIV: Peak Inverse Voltage.
- D. RTD: Resistance temperature detector.
- E. wk^2 : Moment of Inertia.

1.03 SUBMITTALS

- A. Action Submittals:
1. Submit complete motor data with driven equipment Shop Drawings.
 2. Induction motor name and specification number of driven equipment.
 3. Complete motor nameplate data including:
 - a. Rated motor horsepower.
 - b. Voltage, phase and frequency ratings.

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- c. Design full load current at rated horsepower for utilization (motor) voltage.
- d. Number of poles and full-load speed.
- e. Service factor.
- f. Power factor at full, 3/4-load and 1/2-load.
- g. Locked rotor, pull-up, breakdown, and full-load torque.
- h. Guaranteed minimum full-load efficiency, include nominal efficiencies at 1/2-load and 3/4-load.
- i. Maximum number of successive cold and hot starts.
- j. Code letter for locked-rotor kVA/HP.
- k. Locked-rotor inrush in percent of full-load current.
- l. Motor Thermal Performance: Hot and cold start curves.
- m. Winding insulation class and temperature rise class.
- n. Frame size.
- o. Enclosure.
4. Motor type/model and dimension drawing. Include motor component weights.
5. Motor terminal box, RTD box and space heater box dimensions, location on motor, and wiring.
6. Motor lead termination support insulators.
7. Schematic wiring diagram for motor and for devices such as resistance temperature detectors, space heaters, as applicable.
8. Bearing Data:
 - a. Identify type and manufacturer of all bearings to be installed.
 - b. Specify proposed bearing insulation materials and methods and recommended bearing lubricant(s).
 - c. Bearing protection data including resistance temperature detectors, as applicable.
9. Anticipated maximum maintenance weights for rotors and removable housing elements.
10. Shaft radial and axial runout tolerances at various lateral locations.
11. Shaft mass elastic diagram.
12. Motor rotor wk^2 , and load wk^2 , as obtained from driven machinery manufacturer.
13. Motor shaft grounding pickup method shall be via readily accessible, spring-loaded contact brush.
14. Instrumentation, including but not limited to, RTDs. Provide detailed catalog information indicating complete model number derivation and wiring diagrams.

B. Informational Submittals:

1. List demonstrating manufacturer's requisite experience, as well as location of manufacturer and number of years of production.

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2. Lateral and torsional analysis report.
3. Driven equipment and motor manufacturers' detailed mass elastic data.
4. Name, address, telephone number, and contact name for factory-trained and authorized service organization representing motor manufacturer.
5. Written installation, connection, and commissioning instructions for specific motor(s) to be furnished.
6. Factory test results.
7. Component and attachment testing seismic certificate of compliance as required by Section 01 45 36, Equipment Seismic Certification.
8. Operation and Maintenance Data as specified in Section 01 30 00, Administrative Requirements.

1.04 QUALITY ASSURANCE

- A. Production Facility: Motor manufacturer shall produce the medium voltage, induction motors at a facility manufacturer owns or operates under its own supervision.
- B. Requisite Experience: Induction motor manufacturer shall be experienced in manufacture of medium voltage induction motors for at least 10 years. At least 10 years of manufacturer's motors of comparable capacity and complexity shall have been successfully operating in similar condition as ones specified in this section for at least 5 years in the USA.
- C. Service Organizations: Motor manufacturer shall have a factory-owned or authorized service organization.

1.05 SPECIAL GUARANTEE

- A. Provide manufacturer's extended guarantee or warranty, with Buyer named as beneficiary, in writing, as special guarantee. Special guarantee shall provide for correction, or at the option of Buyer, removal and replacement of Work specified in this Specification section found defective during the warranty period defined by Section 00 73 05, Supplementary Conditions. Duties and obligations for correction or removal and replacement of defective Work shall be as specified in the General Conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide materials, equipment, and accessories specified in this section manufactured by:
 1. ABB Motors, Inc.

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2. Electric Machinery/Ideal Electric Company.
3. GE Industrial Systems.
4. National Oilwell/Louis Allis.
5. TECO-Westinghouse Motor Company.
6. Toshiba International Corporation.
7. WEG Electric Motors Corp.

2.02 GENERAL

- A. Provisions of this section apply to induction motors larger than 500 hp and rated 2,300 volts through 13,200 volts.
- B. Electric motors driving identical machines shall be identical.
- C. Motor insulation system shall be inverter-duty, corona-resistant, and partial-discharge-resistant, suitable for continuous operation on a medium-voltage PWM variable frequency drive utilizing a three-level NPC inverter topology, and capable of withstanding repetitive pulse voltages, associated dv/dt, and voltage reflection effects.
- D. Motor shall be required to conform to NEMA standard ratings.
- E. Lateral and Torsional Analysis by driven equipment supplier.
- F. Motors driven by VFDs shall be rated and labeled as suitable for inverter duty, and rated for continuous operation at 50 degrees C ambient temperature running on VFD output at any frequency from 30 Hz to 60 Hz.

2.03 DESIGN REQUIREMENTS

- A. Horsepower Rating: As designated in motor-driven equipment Specification.
- B. Electric motors shall be in accordance with NEMA MG 1, except as indicated in equipment specifications for motors controlled for variable speed operation, constant speed induction motors having starting torque and starting current sufficient to ramp up to speed of driven equipment. In no case shall locked rotor, pull-up or breakdown torque be less than value specified in NEMA MG 1.
- C. Motor Voltage Ratings: 4,000 volts, three-phase, 60-Hz, for use on a 4,160-volt (nominal), three-phase, neutral grounded, 60-Hz system as indicated.

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D. Service Factor:

1. 1.0 for operation on variable frequency drive.
2. 1.15 for operation on a 4,160-volt, 60-Hz power supply.

E. Insulation: Furnish motors with Class F or H insulation, rated to operate at a maximum ambient temperature of 50 degrees C, and at an altitude of 269 feet above sea level, without exceeding Class B temperature rise limits stated in NEMA MG 1-20.8 at rated full load and service factor.

F. Motor Leads and Terminations:

1. Provide three main leads fitted with solderless lug terminals with two holes minimum each.
2. Hole spacing and size shall meet NEMA standards.
3. Six leads shall be brought out to main terminal box for all motors.

G. Rotor Bars:

1. Copper; designed to meet starting and accelerating torque characteristics of NEMA MG 1-20.4.3.1 for Variable Torque Linear applications.
2. Select materials and processes used for fabricated rotor bars to minimize hydrogen embrittlement.
3. Size to assure tight bar construction to eliminate bar vibration.
4. Replaceable without damage to air passages or laminations.

H. Stator:

1. Iron laminations shall utilize C5 core-plate minimum, on both sides, capable of withstanding 1,400 degrees F without deterioration.
2. Brace and support to eliminate any detrimental winding movement.
3. Stator Armature Winding:
 - a. Stranded copper conductors to terminal box.
 - b. Completed winding subjected to two vacuum pressure impregnations in a solventless epoxy resin.

I. Shafts:

1. Material: Hot-rolled C1045, minimum.
2. Stiff-shaft design.
3. Shaft Dimensions: Manufacturer's standard.
4. Provide extended shaft, tapered shaft, double shaft, or short shaft as required.
5. Permanently mark shaft on drive end and indicate magnetic center with a pointed indicator mounted off drive-end bearing cap.

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6. Include reference measurement to locate magnetic center in the event of a broken pointer on motor outline drawing.
 7. Provide drive shaft extension with open-ended keyway and key.
- J. Torque:
1. Motor manufacturer shall review start-up load curve for driven equipment to determine minimum motor capabilities for locked-rotor torque, pull-up torque, and breakdown torque.
 2. Motor speed-torque curve shall exceed driven equipment speed-torque curve by a minimum margin of 10 percent at all points from zero speed to pull-up speed.
 3. Motor shall also be able to start and accelerate, to rated-speed of driven equipment during a 20 percent under-voltage or reduced voltage start condition.
- K. wk^2 :
1. Motors shall be capable of accelerating driven equipment without excessive temperature rises.
 2. Motor acceleration time at specified reduced voltage should not exceed locked rotor safe stall time.
 3. Approximate total load wk^2 of the combined driver/load is determined by the driven-equipment manufacturer.
- L. Number of Starts: Each motor shall be capable of two successive cold starts or one hot start according to NEMA MG 1.
- M. Power Factor: 52 minimum.
- N. Motor Efficiency:
1. Guaranteed Minimum Efficiency: 91 percent.
 2. Stamp nameplate with tested efficiency.
 3. In accordance with IEEE 112.
- O. Capable of operating at 120 percent of full-speed in reverse rotation direction, with no power applied to motor.
- P. Starting: Motors shall be suitable for VFD starting and operation.

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Q. Enclosures:

1. Mechanical protection and method of ventilation or cooling as listed below and as defined in NEMA MG 1-25 for Open Machines and NEMA MG 1-26 for Totally Enclosed Machines.
2. Weather Protected, Type II (WP II):
 - a. Check spaces, dimensions, and arrangement to ensure heat exhaust of one motor is not fed as air intake to an adjacent motor.
 - b. Provide reusable, washable, stainless steel inlet air filters and stainless steel screens.
3. Cooling Air:
 - a. Internal cooling air shall circulate from end(s) of motor towards center of rotor and stator lamination stacks, then through vents in rotor and stator laminations (symmetrical cooling) to exhaust openings or heat exchanger.
 - b. Internal air shall circulate through rotor and stator in a symmetrical manner to minimize hotspots.
4. Hardware: Stainless steel hardware for screens and associated fasteners.
5. Provide openings in stator endplates with access covers for checking motor air gap.

2.04 ACCESSORIES

A. Connection Box:

1. Cast or fabricated steel connection box.
2. Fabricated steel connection boxes shall have hinged covers secured by knurled screws.
3. Gasketed and provisions for grounding.

B. Main Terminal Boxes:

1. Size:
 - a. For three main leads and neutral, incoming cable glands, and accessories.
 - b. To accommodate components and accept power supply conductors, all per NEMA requirements.
2. Construction comparable with degree of enclosure indicated for motor itself.
3. Allot space for mounting of auxiliary devices such as stress cones, and neutral bar.
4. Place an OSHA warning label with the text "DANGER - HIGH VOLTAGE - KEEP OUT" on the cover of the line terminal box.

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- C. Equipment Grounding Lugs: Provide within main terminal box, suitable to terminate equipment ground wire, sized as indicated. Ground path shall be direct to stator frame.
- D. Auxiliary Terminal Boxes:
 - 1. Provide separate boxes for termination of space heaters, stator and bearing RTD or thermocouple leads and other factory-mounted instrumentation.
 - 2. Space heater terminations shall be in a terminal box that is separate from control signal terminations.
 - 3. Wire devices to auxiliary terminal boxes and terminate on suitable terminal blocks.
- E. Space Heaters:
 - 1. Provide to keep motor windings at least 5 degrees C to 10 degrees C above dew point during de-energized conditions.
 - 2. Grid type in base of stator with easy access for maintenance.
 - 3. 120V ac, single-phase power.
 - 4. Prewired to terminal junction box mounted on motor.
 - 5. Provide warning label on space heater junction box and motor indicating space heater wiring is energized when motor is not running.
- F. Provide manufacturer's standard antireverse rotation ratchet.
- G. Equipment Identification Plates: Provide 16-gauge, Type 304 stainless steel identification plate securely mounted on each separate equipment component in a readily visible location. Plate shall bear 3/8-inch high engraved block type black enamel filled equipment identification number indicated in this Specification and as shown.
- H. Frame Grounding Pads: Provide two stainless steel faced grounding pads and locate on opposite sides of motor frame diagonally apart. Grounding pads shall feature a tapped 1/2-inch national coarse (NC) thread drilling into motor frame.
- I. Provide motor shaft grounding to reduce ASD induced bearing voltages (e.g., motor rotor asymmetries) and associated electrostatic discharges through the motor bearings. Motor shaft grounding shall be the manufactured product of Helwig Carbon Products, Inc, Model No. BPK-S.
- J. Lifting Lugs: Provide suitably attached for equipment assemblies and components weighing over 100 pounds.

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2.05 MOTOR BEARINGS

A. Upper Thrust Bearings:

1. Antifriction type.
2. dN factor: less than 300,000.
3. ABMA L10 rating life of 100,000 hours with continuous operation at rated conditions or 50,000 hours at maximum axial and radial loads and rated speed.
4. Bearing Capacity: Rated for weight of pump motor rotating assembly plus maximum hydraulic down-thrust developed by pump. Capable of operating at this rating in either direction of rotation up to runaway speed.
5. Up-thrust Capacity: As required for any operating condition.
6. Oil Lubrication System: Oil bath, self-circulating.
7. Provide oil level sight glass, and threaded oil fill and drain plugs.

B. Lower Guide Bearing:

1. Antifriction type.
2. dN Factor: Less than 300,000.
3. ABMA L10 rating life of 100,000 hours.
4. Oil Lubrication System: Oil bath, self-circulating.
5. Provide oil level sight glass, and threaded oil fill and drain plugs.

C. Upper and lower bearings shall each have a spring-loaded RTD to sense bearing metal temperature.

D. Bearing Insulation: Electrically insulated in a manner to prevent circulating currents from passing through bearing surfaces.

2.06 MOTOR TEMPERATURE DETECTION

A. RTDs:

1. Provide two bearing RTDs (one per bearing) and six stator winding RTDs (two per phase).
2. 100 ohm, three-wire, platinum, and prewired to terminal junction box mounted on motor base.

2.07 FACTORY TESTING

A. General:

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1. Factory test motors in conformance with IEEE 112, IEEE 43, and NEMA MG 1.
2. Notify Engineer a minimum of 5 weeks prior to test.
3. No equipment shall be shipped until Engineer has approved test data.
4. Witnessed by Engineer.
5. Acceptance:
 - a. In the event motor fails to meet above requirements or efficiencies make necessary modifications, repairs, or replace entire motor.
 - b. Retest motor until found satisfactory.
6. Test Reports:
 - a. Include documentation and results.
 - b. Indicate test procedure and instrumentation used to measure and record data.
 - c. Certified, signed, and dated by motor manufacturer's test personnel and a registered Professional Engineer.

B. Tests:

1. Routine:
 - a. Measurement of winding resistance.
 - b. No-load motoring readings of current, power, and speed at rated voltage and frequency.
 - c. Measure and record air gap during assembly.
 - d. Visually inspect bearing and bearing insulation.
 - e. High potential test in accordance with NEMA MG 1-20.17.
2. Surge: Test stator coils individually after insertion into stator core, but prior to coil-to-coil connection, to ensure no turn-to-turn shorts. Repeat surge test after coil-to-coil connections are complete.
3. High Potential: High pot stator coils individually after insertion into stator core, but prior to coil-to-coil connection, to ensure no turn-to-turn shorts. Repeat high potential test after all coil-to-coil connections are complete.
4. Efficiency and Loss: Use any IEEE 112 Method B only. Included the following in determining efficiency per NEMA MG 1-20.21.
 - a. Stator I^2R .
 - b. Rotor I^2R .
 - c. Core loss.
 - d. Stray load losses.
 - e. Friction and windage loss.
5. Phase Rotation:
 - a. Apply phase sequence as called for on outline drawing and check for correct direction of rotation.
 - b. Record direction of rotation and phase sequence.

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6. Temperature:
 - a. Perform heat run tests on motors via embedded detector, using either of the IEEE 112 8.2.3 methods of loading.
 - b. Record stator and bearing temperatures every 30 minutes until machine reaches constant temperature.
 - c. Determine temperature rise for service factor loading.
7. Blocked Rotor Test: With rotor blocked, take the following readings at highest voltage possible: line voltage, current, kW, torque, and induced field current.
8. Noise:
 - a. In accordance with NEMA MG 1, Part 9.
 - b. Mean A-weighted sound pressure level measured at one meter from major machine surface shall not exceed 85 dB (A) with motor operating at no-load, and rated frequency and voltage applied.
9. Vibration:
 - a. Radial Shaft at Full Operating Speed: 2.0 mils peak-to-peak, maximum.
 - b. Take vibration data at cold and hot operating conditions, at no-load during factory testing.
 - c. Transient Shaft Vibration: 3.5 mils peak-to-peak, maximum, throughout normal startup and shutdown speed range.
 - d. Values shall include shaft surface runout sensed by probes.
 - e. Shaft Runout: At slow roll speeds of less than 100 rpm shall be less than 0.25 mils peak-to-peak, maximum.
 - f. Bearing Housing Vibration:
 - 1) At full operating speed shall be 0.15 inches per second (RMS), maximum.
 - 2) Take vibration data at cold and hot conditions, at no-load.
 - 3) Transient Vibration: 0.5 IPS RMS, maximum, throughout normal startup and shutdown speed range.
 - g. Vibration Frequency:
 - 1) Record during vibration testing at cold and hot conditions.
 - 2) Record frequencies up to seven times line frequency.
 - 3) When operated uncoupled at rated speed, machinery shall not exhibit unusual or abnormal frequency components on either shaft or casing vibration measurements.
 - 4) Normal frequency components are defined as excitations such as rotational speed, synchronous and multiples of synchronous frequency, or blade passing frequency that are inherent with mechanical construction of machinery.
 - 5) Unusual or abnormal frequency components are excitations that are nonsynchronous or not related to known geometry of machinery.

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10. Starting Characteristics: Determine speed-torque characteristics using any of the four IEEE 112-7.3.2 recommended methods.
11. Final Factory AC High Potential Test:
 - a. Perform after above tests are completed to assure no damage to insulation during setup and testing.
 - b. Apply 1,000 volts plus twice rated machine voltage across stator insulation and 2,500 volts across rotor insulation for one minute, per NEMA MG 1, Part 3.
12. Final Insulation Resistance: Take reading of armature insulation with mega-ohmmeter for one minute after high potential test has been completed.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 40 27 02
PROCESS VALVES AND ACTUATORS

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Society of Mechanical Engineers (ASME):
 - a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
2. American Water Works Association (AWWA):
 - a. C516, Large-Diameter Rubber-Seated Butterfly Valves, Sizes 78 In. (2,000 mm) and Larger.
 - b. C542, Electric Motor Actuators for Valves and Slide Gates.
 - c. C550, Protective Interior Coatings for Valves and Hydrants.
3. ASTM International (ASTM):
 - a. A276, Standard Specification for Stainless Steel Bars and Shapes.
 - b. A351/A351M, Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.
 - c. A380, Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
 - d. A564/A564M, Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes.
 - e. B61, Standard Specification for Steam or Valve Bronze Castings.
 - f. B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
 - g. B98/B98M, Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.
 - h. B127, Standard Specification for Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip.
 - i. B139/B139, Standard Specification for Phosphor Bronze Rod, Bar and Shapes.
 - j. B164, Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.
 - k. B194, Standard Specification for Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar.
 - l. B584, Standard Specification for Copper Alloy Sand Castings for General Applications.
 - m. D429, Standard Test Methods for Rubber Property-Adhesion to Rigid Substrates.
4. National Electrical Manufacturers Association (NEMA): 250, Enclosures for Electrical Equipment (1000 Volts Maximum).

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5. NSF International (NSF): NSF/ANSI/CAN 61, Drinking Water System Components - Health Effects.
6. UL.

1.02 QUALITY ASSURANCE

- A. Valve manufacturers shall have a minimum of 15 years' experience in the design and manufacture of valves substantially similar to those specified herein.

1.03 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. Product data sheets for each make and model. Indicate valve Type Number, applicable Tag Number, and facility name/number or service where used.
 - b. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
 - c. Power and control wiring diagrams, including terminals and numbers.
 - d. For each power actuator provided, manufacturer's standard data sheet, with application specific features and options clearly identified.
 - e. Maximum torque required to seat and unseat valve.
 - f. Test data of rated flow coefficient (Cv). Provide data in graph or table format with data points at a maximum of 10 degrees intervals, for disk angles of 10 degrees through 90 degrees.
 - g. Sizing calculations for electric motor actuated valves showing that the motor operator is of sufficient size to seat and unseat the valve and hold the disk at any intermediate position under the maximum pressure conditions.

B. Informational Submittals:

1. Reference list of at least ten installations where butterfly valve manufacturer has provided butterfly valves 84-inch diameter, or greater, at least one of which with the 10-year period preceding the bid date. Include project name, end user name, location, valve sizes, installation date, and operating pressure.
2. Schedule of factory leakage tests not less than 30 calendar days in advance of each proposed test.

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3. Manufacturer's Certificate of Compliance, in accordance with Section 01 30 00, Administrative Requirements, for:
 - a. Electric actuators; full compliance with AWWA C542.
 - b. Butterfly valves; full compliance with AWWA C516.
4. Special shipping, storage and protection, and handling instructions.
5. Manufacturer's printed installation instructions.
6. Tests and inspection data.
7. Operation and Maintenance Data as specified in Section 01 30 00, Administrative Requirements.
8. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 43 34, Special Services.

1.04 EXTRA MATERIALS

A. Spare Parts:

1. Furnish, suitably tag and mark, and securely package for long-term storage, the following items:
 - a. One spare valve seat.
 - b. One complete set gaskets and seals.
2. Deliver spare parts in accordance with Section 01 61 01, Product Requirements.

1.05 SPECIAL GUARANTEE

- A. Provide manufacturer's extended guarantee or warranty, with Buyer named as beneficiary, in writing, as special guarantee. Special guarantee shall provide for correction, or at the option of Buyer, removal and replacement of Work specified in this Specification section found defective during the warranty period defined by Section 00 73 05, Supplementary Conditions. Duties and obligations for correction or removal and replacement of defective Work shall be as specified in the General Conditions.

PART 2 PRODUCTS

2.01 GENERAL

- A. Valve to be suitable for intended service. Renewable parts not to be of a lower quality than specified.
- B. Valve same size as adjoining pipe, unless otherwise called out on Drawings or in Supplements.
- C. Valve ends to suit adjacent piping.

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- D. Resilient seated valves shall have no leakage (drip-tight) in either direction at valve rated design pressure. All other valves shall have no leakage (drip-tight) in either direction at valve rated design pressure, unless otherwise allowed for in this section or in stated valve standard.
- E. Size operators and actuators to operate valve for full range of pressures and velocities.
- F. Valve to open by turning counterclockwise, unless otherwise specified.

2.02 MATERIALS

- A. Bronze and brass valve components and accessories that have surfaces in contact with water to be alloys containing less than 16 percent zinc and 2 percent aluminum.
 - 1. Approved alloys are of the following ASTM designations: B61, B62, B98/B98M (Alloy UNS No. C65100, C65500, or C66100), B139/B139M (Alloy UNS No. C51000), B584 (Alloy UNS No. C90300 or C94700), B164, B194, and B127.
 - 2. Stainless steel Alloy 18-8 may be substituted for bronze.

2.03 VALVES

- A. Butterfly Valves:
 - 1. Tag Numbers: FV-802, FV-810.
 - 2. In full compliance with AWWA C516, Class 150B.
 - 3. Nominal Size: 84 inch.
 - 4. Laying Length: 18 inches.
 - 5. Valve Rated Pressure: 150 psig.
 - 6. Operating Conditions:
 - a. Fluid: Screened raw river water.
 - b. Fluid Temperature: 40 degrees F to 75 degrees F.
 - c. Design Operating Inlet Pressure: 10 psig.
 - d. Design Operating Outlet Pressure: 4 psig.
 - e. Maximum Flow Rate: 262.5 cubic feet per second.
 - f. Valves will be required to be moved to a partially closed (throttled) position under the maximum flowrate conditions listed. The maximum head (feet of water) differential across a partially closed valve at the maximum flowrate listed above will be approximately 15 feet.
 - g. The valves will not be moved to a fully closed position when the pump is in operation.

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- h. Suitable for continuous submerged service and operation after long periods of inactivity.
 - i. Bubble-tight with rated pressure applied from either side.
- 7. End Connections: Flanged, Class 125.
- 8. Body: Cast iron or ductile iron, with integral lifting eyes or factory-threaded holes for external swivel hoist rings.
- 9. Disc: Ductile iron.
- 10. Shafts:
 - a. Type 304 stainless steel with multiple V-ring shaft packing.
 - b. Shaft shall not penetrate the seat or the seating surface.
- 11. Design disc and shaft to create a camming effect to allow the disc to swing into and out of the seat to reduce wear between the seat and seating surface.
- 12. Valve Seat:
 - a. Buna-N rubber.
 - b. Design seat to permit removal, replacement, and adjustment from the downstream side of the valve without removal of valve from the mating pipe.
 - c. Locate seat in either the valve body and mating with a stainless steel seating surface located on the valve disc, or located in the valve disc and mating with a stainless steel seating surface located in the valve body.
 - d. Body mounted seats shall be locked into a recessed cavity in the valve body by means of epoxy injection method.
 - e. Disc mounted seats shall be clamped to the disk with a stainless steel retaining ring fastened to the disk. Retaining ring and fasteners shall be Type 316 stainless steel.
 - f. Mating surfaces for the valve seat shall be Type 316 stainless steel. Sprayed or plated surfaces are not acceptable.
- 13. No travel stops for disc on interior of body.
- 14. Mark valves with a flow arrow indicating recommended flow direction.
- 15. Isolate metal-to-metal thrust bearing surfaces from flowstream.
- 16. Provide factory applied NSF/ANSI/CAN 61 certified 8-mil dry film thickness interior lining and exterior coatings per AWWA C550.
- 17. Bonnet Extension Assembly:
 - a. Carbon steel bonnet extension, configuration as shown by Drawings. Provide with seals to exclude debris from entering interior.
 - b. Stainless steel stem extension, support brackets, and all necessary accessories for valve and actuator.
 - c. Interior and exterior coatings shall match specified valve coatings.
 - d. Provided by valve manufacturer.

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18. Testing:
 - a. Buyer reserves the option to witness factory leakage tests either in-person or remote.
 - b. For remote witnessed tests, provide and record live-stream video with two-way audio and clear views of test instrumentation and the equipment being tested. Utilize commercial web-enabled conferencing applications such as Microsoft Teams, Webex, Zoom, or equivalent.
 - c. Submit schedule of testing activities not less than 30 days in advance of tests. Submit a minimum 5-day notice if tests will be cancelled.
 - d. Perform factory leakage test with valves orientated as shown by installation drawings (attached to horizontal piping with valve stem vertical).
19. Manufacturers:
 - a. Henry Pratt Company, LLC.
 - b. DeZurik, Inc.
 - c. Val-Matic Valve & Mfg. Corp.

B. Electric Motor Actuators:

1. General:
 - a. 480-volt supply power.
 - b. Comply with latest version of AWWA C542.
 - c. Size to 1-1/2 times required operating torque. Motor stall torque not to exceed torque capacity of valve.
 - d. Controls integral with actuator and fully equipped as specified in AWWA C542.
2. Actuator Operation—General:
 - a. Suitable for full 90-degree rotation of quarter-turn valves.
 - b. Manual override handwheel.
 - c. Valve position indication.
 - d. Travel Time: 480 seconds to transition from either FULL CLOSED to FULL OPEN, or from FULL OPEN to FULL CLOSED.
 - e. Actuator suitable for OPEN-CLOSE service, and throttling operation of valve at intermediate positions.
 - f. Size motors for one complete FULL OPEN to FULL CLOSE to FULL OPEN cycle no less than once every 16 minutes.
 - g. OPEN and CLOSED indicating lights.
 - h. Integral reversing motor starter with built-in overload protection.

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3. Control Features:
 - a. Nonintrusive Electronic Control: Local controls, diagnostics, and calibration, including limit and torque settings, shall be accomplished nonintrusively. Electronic valve position display with capability to show continuous torque output. If applicable, provide two hand-held configuration units.
 - b. LOCAL-OFF-REMOTE (LOR) Selector Switch, padlockable in each position:
 - 1) Integral OPEN-STOP-CLOSE momentary pushbuttons with seal-in circuits to control valve in LOCAL position.
 - 2) Remote OPEN-STOP-CLOSE momentary control dry contact inputs in REMOTE position. Integral seal-in circuits for remote OPEN and CLOSE commands; valve travel stops when remote STOP contact opens.
 - c. Actuator shall remain in last position upon loss of signal.
 - d. Motor and control enclosure(s) NEMA 250, Type 4 with 120-volt space heaters.
 - e. Valve position output converter that generates isolated 4 mA to 20 mA dc signal in proportion to valve position, and is capable of driving into loads of up to 500 ohms at 24V dc.
 - f. Externally operable power disconnect switch.
4. Communications:
 - a. Communication Protocol: Modbus RTU.
 - b. Communication Method: Single RS-485 twisted pair, shielded wire network.
 - c. Communication Topology: Redundant loop.
5. Limit Switches:
 - a. Single-pole, double-throw (SPDT) type, field adjustable, with contacts rated for 5 amperes at 250V ac.
 - b. Housed in actuator control enclosure.
 - c. Provide each valve actuator with auxiliary contact outputs as follows:
 - 1) Valve FULL OPEN, switch normally closed.
 - 2) Valve FULL OPEN, switch normally open.
 - 3) Valve FULL CLOSED, switch normally closed.
 - 4) Valve FULL CLOSED, switch normally open.
 - 5) LOR Selector Switch in REMOTE, switch normally closed.
 - 6) LOR Selector Switch in REMOTE, switch normally open.
6. Manufacturers:
 - a. AUMA.
 - b. EIM.
 - c. Rotork Controls.
 - d. Flowserve Limitorque.

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2.04 ACCESSORIES

- A. Tagging: 1-1/2 inch diameter heavy brass or stainless steel tag attached with No. 16 solid brass or stainless steel jack chain for each valve operator, bearing valve tag number.

PART 3 EXECUTION

3.01 GENERAL

- A. The valve manufacturer shall be responsible for preparing valves, actuators, and accessories for shipment and shall be responsible for them until they are received by Buyer's installation contractor.

3.02 INSTALLATION

- A. Installation will be performed by Buyer's installation contractor, except as otherwise required by specified Manufacturer's Special Services.

3.03 FIELD QUALITY CONTROL

- A. Field quality control work will be performed by Buyer's installation contractor, except as otherwise required by specified Manufacturer's Special Services.

3.04 MANUFACTURER'S SPECIAL SERVICES

- A. Electric motor actuated valves require manufacturer's field services.
- B. Manufacturer's Representative present at Site for minimum person-days listed below, travel time excluded:
 - 1. 2 person-days for installation assistance and inspection.
 - 2. 1 person-day for functional and performance testing and completion of Manufacturer's Certificate of Proper Installation.
- C. See Section 01 43 34, Special Services.

END OF SECTION

SECTION 44 42 56.23
VERTICAL AXIAL-FLOW PUMPS

EQUIPMENT IDENTIFICATION

Unit 2
Unit 10

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Petroleum Institute (API): 610, Centrifugal Pumps for Petroleum, Petrochemical, and Natural Gas Industries.
 2. American Water Works Association (AWWA): ANSI/AWWA, Standard E103-15 Horizontal and Vertical Line-Shaft Pumps.
 3. ASTM International (ASTM):
 - a. A36/A36M, Standard Specification for Carbon Structural Steel.
 - b. A48, Standard Specification for Gray Iron Castings.
 - c. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - d. A536, Standard Specification for Ductile Iron Castings.
 - e. A582, Standard Specification for Free-Machining Stainless Steel Bars.
 - f. A743, Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.
 4. Hydraulic Institute Standards (HI):
 - a. 9.6.3, Rotodynamic (Centrifugal and Vertical) Pumps – Guideline for Allowable Operating Range.
 - b. 9.6.4, Rotodynamic Pumps for Vibration Measurements and Allowable Values.
 - c. 9.6.8, Rotodynamic Pumps – Guideline for Dynamics of Pumping Machinery.
 - d. 14.4, Rotodynamic Pumps for Installation, Operation, and Maintenance.
 - e. 14.6, Rotodynamic Pumps for Hydraulic Performance Acceptance Tests.
 5. National Electrical Manufacturer's Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).
 - b. MG 1, Motors and Generators.

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6. NSF International (NSF): NSF/ANSI/CAN 61, Drinking Water System Components - Health Effects.
7. UL: 674, Standard for Safety for Electric Motors and Generators for use in Division 1 Hazardous (Classified) Locations.

1.02 DEFINITIONS

- A. Terminology pertaining to pumping unit performance and construction shall conform to the ratings and nomenclature of the Hydraulic Institute Standards (HI) and of ANSI/AWWA E103, Horizontal Centrifugal and Vertical Line Shaft Pumps.

1.03 QUALITY ASSURANCE

- A. Pump manufacturer shall have a minimum of 15 years' experience in the design and manufacture of vertical axial flow pumps substantially similar to pumps specified herein.
- B. Pump manufacturer shall be responsible for providing the vibration analysis specified herein. The vibration analysis shall be performed by Mechanical Solutions Inc. (MSI) of Whippany, NJ, or Engineering Dynamics Inc. (EDI) of San Antonio, TX or alternatively by pump manufacturer if pump manufacturer demonstrates successful vibration analysis experience in at least twenty projects similar in scope.

1.04 SUBMITTALS

- A. Action Submittals:
 1. Make, model, weight, and horsepower of each equipment assembly.
 2. Complete catalog information, descriptive literature, specifications, keyed bill of materials, and identification of materials of construction.
 3. Performance data curves showing total pump head, capacity, brake horsepower, submergence required, NPSHR, AOR, POR, and pump efficiency from shutoff to runout. Indicate all values separately at each design flow condition.
 4. Certified dimensional outline and installation drawings including; dimensions, sizes and locations of connections, and weights of equipment. Soleplate drawings shall include leveling screw and leveling plate details as indicated by HI 14.4, with anchor bolt hole pattern to match existing anchorage.
 5. Calculations:
 - a. Level 3 analysis in accordance with HI 9.6.8.

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- b. Torsional analysis for complete rotating assembly. Analysis report shall include the specific items of API 610, Part 6.9, Dynamics.
- c. Lateral vibration analysis for driver pedestal and motor assembly, and for column pipe and bowl assembly.
- 6. Reverse Runaway Speed: Pump manufacturer's estimated maximum reverse runaway speed for pump and motor assembly. Submit coincident reverse flow and pump head for speed estimates.
- 7. Pump maximum downthrust and upthrust in pounds.
- 8. Power and control wiring diagrams, including terminals and numbers.
- 9. Motor data in accordance with Section 26 19 00, Medium-Voltage Induction Motors.
- 10. Electrical drawings including circuit schematics, interconnection diagrams, and all information necessary for connection of motors and electrical and instrumentation components.
- 11. Complete description of all factory finish systems including surface preparation and product data sheets. Submit in accordance with Section 09 90 00, Painting and Coating.
- 12. Factory hydrostatic and performance test procedures in accordance with HI 14.6. For all tests, include drawings of the test configuration and instrument locations.

B. Informational Submittals:

- 1. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 01, Product Requirements, that factory finish system is identical to requirements specified herein.
- 2. Schedule of factory performance testing not less than 30 calendar days in advance of each proposed test.
- 3. Special shipping, storage and protection, and handling instructions.
- 4. Manufacturer's printed installation instructions, including details of soleplate installation as specified.
- 5. Factory Functional and Performance Test Reports and Log. Factory test data for each pump shall be submitted, reviewed, and approved by Engineer prior to shipment of equipment.
- 6. Suggested spare parts list to maintain equipment in service for a period of 1 year and 5 years. Include a list of special tools required for checking, testing, parts replacement, and maintenance with current price information.
- 7. List special tools, materials, and supplies furnished with equipment for use prior to and during startup and for future maintenance.
- 8. Component and attachment testing seismic certificate of compliance as required by Section 01 45 36, Equipment Seismic Certification.
- 9. Operation and Maintenance Data: As specified in Section 01 30 00, Administrative Requirements.

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10. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 43 34, Special Services.

1.05 EXTRA MATERIALS

A. Spare Parts and Special Tools:

1. Spare Parts:
 - a. Furnish, suitably tag and mark, securely pack and crate in a hinged-cover box or boxes suitable for shipment and long-term storage, the following items:
 - 1) One spare propeller.
 - 2) One spare discharge bowl liner and associated fasteners, or one bolt-on impeller bowl section, as applicable.
 - 3) One complete set of line shafts, and bowl shaft.
 - 4) One complete set of shaft couplings.
 - 5) One complete set of line shaft and pump shaft bearings.
 - 6) One complete set shaft packing.
 - 7) One complete set gaskets and seals.
2. Special Tools:
 - a. Furnish one complete set of special tools required for assembly and disassembly of the pumps and all other appurtenances and accessories that may be required to make the pumps complete and ready for operation. Special tools are those tools, which because of their limited use, are not normally available but which are necessary to service the equipment.
 - b. Furnish tools of high-grade, forged alloy, tool steel.
 - c. Furnish a steel box for storage of the special tools.
3. Deliver spare parts and special tools in accordance with Section 01 61 01, Product Requirements.

1.06 SPECIAL GUARANTEE

- A. Provide manufacturer's extended guarantee or warranty, with Buyer named as beneficiary, in writing, as special guarantee. Special guarantee shall provide for correction, or at the option of Buyer, removal and replacement of Work specified in this Specification section found defective during the warranty period defined by Section 00 73 05, Supplementary Conditions. Duties and obligations for correction or removal and replacement of defective Work shall be as specified in the General Conditions.

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PART 2 PRODUCTS

2.01 GENERAL

- A. Pump manufacturer shall provide motors and shall be responsible for the following:
 - 1. Coordination of pump and motor requirements with variable frequency drive characteristics defined by Section 26 19 00, Medium-Voltage Induction Motors.
 - 2. Torsional vibration of rotating assembly and related stresses.
 - 3. Motor thermal rating.
 - 4. Structural design of pump and motor assembly.
 - 5. Minimum motor speed rating for required corresponding torque.
- B. Lateral and Torsional Vibrations:
 - 1. Pump and motor assembly shall have no natural frequencies within 20 percent of operating speed range.
 - 2. Fundamental critical speed of rotating assembly shall be no less than 30 percent above the rated speed.
 - 3. Pump manufacturer shall conduct an analysis of the lateral and torsional vibration of pump and motor assembly.
 - a. Excitation frequency range of the analysis shall include, but not be limited to, number of motor poles and number of propeller vanes.
 - b. Perform detailed stress analysis for pump, coupling, motor system at each critical speed, and steady-state operating condition.
 - c. Stress analysis shall demonstrate that in no case shall maximum stress on pump, coupling and motor component exceed endurance limits of pump, coupling, or motor assembly components.
 - d. The allowable shaft shear stresses (endurance limits) shall be determined in accordance with ASME B106.1M, Design of Transmission Shafting or an equivalent method. A factor of safety of at least 2 shall be included in the allowable stress levels.

2.02 MANUFACTURERS

- A. Manufacturers:
 - 1. Cascade Pump Co.
 - 2. MWI.
 - 3. Sulzer.

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2.03 SERVICE CONDITIONS

- A. Liquid Pumped: Screened raw water with varying amounts of sand, silt, and aquatic growth.
- B. Water Temperature: 40 degrees F to 75 degrees F.
- C. Design Ambient Temperature: 15 degrees F to 122 degrees F.
- D. Site Altitude: Approximately 270 feet.
- E. NPSHA at Rated Condition: 43.5 feet.

2.04 PERFORMANCE REQUIREMENTS

- A. Pump operating at rated speed shall not overload the motor nameplate rating throughout the AOR.
- B. Pump performance curve shall exhibit a continuously rising head from runout to not less than 85 percent of the minimum AOR.
- C. Minimum Submergence: 14.7 feet.
- D. Operating Head Range at Rated Speed: 12.5 feet to 8 feet TDH.
- E. Rated Condition:
 - 1. Capacity: 262.5 cfs.
 - 2. Pump Total Head: 12.5 feet.
 - 3. Pump Efficiency: Not less than 78 percent.
 - 4. NPSHR: Not greater than 32 feet.
- F. Secondary Conditions:
 - 1. Minimum AOR:
 - a. Capacity: Not greater than 232 cfs.
 - b. Pump Total Head: Not less than 16 feet.
 - 2. Maximum AOR:
 - a. Capacity: Not less than 300 cfs.
 - b. Pump Total Head: Not greater than 8 feet.
 - c. NPSHR: Not greater than 37 feet.
- G. Pump Nominal Rated Speed: 323 rpm.

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- H. Design pump to start and stop against an open discharge valve and a closed check type flap gate and to operate satisfactorily over the expected range of total heads.
- I. Pump Reverse Rotation: Pump shall be capable of operating at runaway speed in reverse rotation without damage.

2.05 PUMP CONSTRUCTION DETAILS

A. General:

- 1. ASTM, AISI, etc., numbers, types, and grades specified are typical of material composition and quality. Equivalent materials will require review and approval by Engineer.
- 2. Fasteners: Fasteners located below the baseplate shall be stainless steel.
- 3. Maximum combined weight of motor and pump (dry): 87,000 pounds.

B. Pump Configuration:

- 1. Vertical, axial flow type with shaft enclosing tube and below-deck discharge nozzle, driven by a solid shaft, squirrel-cage, adjustable-speed motor.
- 2. Pump dimensions and arrangement shall be in accordance with Drawings.

C. Pump Shaft Lubrication:

- 1. Provide Alemite grease fitting with stainless steel feed tubing routed to the suction bell bearing. Locate grease fitting such that it is easily accessible at the driver pedestal without removal of the shaft coupling guard.
- 2. Provide gravity oil feed lubrication system to serve shaft bearings in the enclosing tube and discharge bowl. Gravity oil feed lubrication system shall include:
 - a. Cast aluminum oil reservoir with 5-gallon capacity, factory-mounted to the pump driver pedestal. Provide with borosilicate sight glass and hinged lid that can be secured with a padlock.
 - b. Solenoid-operated valve to enable flow of oil with brass body, resilient seat suitable for oil, solenoid coil molded epoxy, NEMA insulation Class F, 120V ac, 60 Hz, NEMA 250, Type 4 enclosure, normally closed (energize to open).
 - c. Adjustable sight feed oil drip valve.
 - d. Manual bypass around solenoid valve with non-lead bronze isolation valve.
 - e. Piping: Type K copper.

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D. Shaft Enclosing Tube:

1. Steel pipe, ASTM A53, Grade B, Schedule 80.
2. The ends of the enclosing tube shall be threaded internally for connection to the line shaft bearings.
3. The enclosing tubes shall support the line shaft bearings from the tension nut body assembly to the discharge bowl.
4. Enclosing tube section lengths not to exceed 5 feet.

E. Tension Nut Body Assembly:

1. Cast iron with non-lead bronze lock ring and bearing or all non-lead bronze construction.
2. Threaded to the enclosing tube to allow tensioning.
3. Provide NPT connection for oil lubrication line.
4. Bearing grooved for oil lubrication.

F. Line Shaft Bearings:

1. Non-lead bronze, grooved for oil lubrication.
2. Bearing spacing shall be as required to prevent resonant vibrations of the line shaft, but not greater than 5 feet.
3. Bearings shall be threaded externally to act as couplings for the shaft enclosing tubes.

G. Line Shaft and Bowl Shaft:

1. ASTM A582, Type 416 stainless steel.
2. Chrome-plating at bearing and packing locations, not less than 0.01-inch thick, minimum hardness 500 BHN.

H. Shaft Couplings: Keyed construction, match shaft material.

I. Propeller:

1. Stainless steel, ASTM A743, Grade CF3.
2. Casting shall be free of blow holes, chilled areas, slag, and foreign matter. Repair or reject defective castings.
3. Hand finish hub and blades to as smooth a surface as is practicable.
4. Provide shaft keys, thrust rings, and fasteners of stainless steel, ASTM A582, Type 416.
5. Statically and dynamically balanced, residual imbalance no greater than 75 percent of the limit defined by ISO 21940, Grade G6.3.

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J. Suction Bell:

1. Cast iron, ASTM A48, Class 30.
2. Outside Diameter: 94 inches.
3. Provide with guide vanes to minimize losses and prevent vortexing.
4. Provide grease-lubricated bearing in suction bell with stainless steel grease line extended from baseplate.
5. Suction Bell Bearing: Non-lead bronze, grooved for grease lubrication, length not less than two times the shaft diameter.
6. Provide non-lead bronze protecting collar at suction bell bearing.

K. Discharge Bowl:

1. Cast iron, ASTM A48, Class 30.
2. Provide with bypass port to relieve pressure in enclosing tube.
3. Provide with non-lead bronze bearing.
4. Provide replaceable stainless steel liner secured to bowl flange with stainless steel fasteners. Alternatively, provide with a replaceable bolt-on impeller bowl section constructed of CA15 cast stainless steel.

L. Discharge Column:

1. Fabricated steel, diameter and wall thickness shall match discharge elbow.
2. Flanged and registered joints with machined groove and Buna-N O-ring seal.
3. Column section lengths not to exceed 10 feet.

M. Discharge Elbow:

1. Steel, fabricated five-piece mitered elbow or forged long-radius elbow, minimum 3/8-inch wall thickness.
2. Discharge Nozzle Size: 84-inch outside diameter.
3. Plain-end with harness tie lugs in accordance with Drawings.
4. Flanged and registered joints at column connections.

N. Pump Soleplate:

1. Construct of steel plate with thickness as required to prevent deflection, but not less than 1-3/4 inches.
2. Provide with shop-installed shear keys, tapped leveling screw holes, and through holes for anchor bolts as shown on Drawings.
3. Machine top of soleplate flat to 0.001 inch after shear keys have been installed.

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O. Driver Pedestal:

1. Provide driver pedestal with windows for access to motor coupling and shaft packing.
2. Reinforce driver pedestal with gusset plates or by other means as required for operation with specified adjustable-speed motor over the required operating rpm range.
3. Provide OSHA-compliant hinged and lockable stainless steel expanded metal guards over access windows. Provide guard perimeter with stainless steel U-edging such that they are free of sharp edges.

P. Motor Shaft Coupling:

1. Flanged, adjustable type, steel AISI 1020.
2. Registered fits to assure positive alignment.
3. Dynamically balanced and match marked.

2.06 DRIVE MOTOR

- A. See Supplements following “End of Section” as part of this Specification.

2.07 FACTORY FINISHING

- A. General: Coating System No. in accordance with Section 09 90 00, Painting and Coating.
- B. Motor: Coat with manufacturer’s standard corrosion-resistant outdoor-service coating.
- C. Soleplate:
1. Top Surfaces: System No. 5, except bare at interface with driver pedestal flange.
 2. Bottom Surface: As required for epoxy grout installation.
- D. Driver Pedestal:
1. Exterior Surfaces: System No. 5, except bare at interface with soleplate.
 2. Interior Surfaces: System No. 1.
- E. Column Pipe:
1. Exterior Surfaces: System No. 1.
 2. Interior Surfaces: System No. 1.

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F. Enclosing Tube:

1. Exterior Surfaces: System No. 1 or System No. 29.
2. Interior Surfaces: System No. 1 or System No. 29.

G. Discharge Bowl and Suction Bowl:

1. Exterior Surfaces: System No. 1 or System No. 29.
2. Interior Surfaces: System No. 29.

2.08 ACCESSORIES

A. Equipment Identification Plate:

1. A stainless steel nameplate shall be attached to each pump on the driver pedestal and 1/4-inch die-stamped with the following information:
 - a. Buyer's designated equipment number.
 - b. Manufacturer's name.
 - c. Manufacturer's size and model designation.
 - d. Serial number.
 - e. Rated capacity and head.
 - f. Rated speed.
 - g. Propeller adjustment clearance.
 - h. Lubrication requirements.
 - i. Direction of rotation.

B. Provide removable lifting eye bolts attached to the driver pedestal baseplate or provide driver pedestal with integral lifting lugs.

2.09 SOURCE QUALITY CONTROL

A. Factory Motor Tests: Tests in accordance with Section 26 19 00, Medium-Voltage Induction Motors.

B. Hydrostatic Tests: Pump casing(s) tested at 150 percent of shutoff head. Test pressure maintained for not less than 5 minutes.

C. Factory Pump Performance Tests:

1. Pump performance tests will be witnessed by up to four Buyers or Engineer representatives. Testing shall not be scheduled on weekends or federal holidays.
2. Conduct on each pump in accordance with HI 14.6, Acceptance Grade 1U, and as follows.

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3. Perform under simulated operating conditions at the manufacturer's facility.
4. Perform tests at specified minimum submergence.
5. Perform tests using a job motor that has received complete and certified tests.
6. Acceptance Tests:
 - a. Test pumps at 100 percent of rated speed using sinusoidal power.
 - b. Log a minimum of 12 test data points, including:
 - 1) Operation at motor nameplate shaft horsepower.
 - 2) Minimum and maximum AOR.
 - 3) Runout.
7. Reference Tests:
 - a. Test pumps at reduced speed using a shop inverter at 100 percent, 90 percent, 80 percent, 70 percent, and 60 percent of rated speed.
 - b. Test point flow rates shall be calculated using affinity rules and based on the test flow rates selected for acceptance tests.
8. Operate pumps continuously for at least 1-hour at rated speed before beginning acceptance tests. For each pump, include a minimum 3-hour continuous operating period without malfunction.
9. Test Instrumentation:
 - a. Instrumentation used during tests must have valid calibration certificates at date of test. Copies of motor and instrument calibration certificates shall be provided to test witnesses prior to start of tests and shall be included with test data logs.
 - b. Include documentation of supply power current transformers (CTs) and voltage transformers (VTs), and power meter used during tests. Log CT and VT ratios and power meter scale factors in test log. If strain gauges are used to measure pump input power, provide associated calibration data.
 - c. Provide test witnesses access to all test instrumentation for inspection prior to start of tests.
10. Record the following data at each test data point:
 - a. Suction water level and elevation difference to pressure instrument.
 - b. Date and time.
 - c. Discharge head or pressure.
 - d. Rate of flow.
 - e. Shaft rpm.
 - f. Motor input power (kW).
 - g. Motor input frequency (Hz).
 - h. Record the following for tests using sinusoidal motor input power:
 - 1) Motor input voltage.
 - 2) Motor input amperage.
 - 3) Power factor.

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- i. Shaft strain gauge voltage, if applicable.
- j. Vibration at upper and lower bearings.
- k. Water temperature.
- 11. Test Reports:
 - a. Include raw and normalized test data sheets and curves of test results.
 - b. Normalize test data to correct for differences between test conditions and the installed condition.
 - c. Do not normalize test rpm when job motor is used.
 - d. Calculate motor output power using measured motor input power and calibrated motor efficiency curve.
- 12. Test data sheets shall be certified correct by a professional engineer registered in the State of California.

PART 3 EXECUTION

3.01 GENERAL

- A. The pump manufacturer shall be responsible for preparing pumps and motors for shipment and shall be responsible for them until they are received by Buyer's installation contractor.
- B. Pumps shall be shipped assembled.

3.02 INSTALLATION

- A. Installation will be performed by Buyer's installation contractor, except as otherwise required by specified Manufacturer's Special Services.

3.03 FIELD QUALITY CONTROL

- A. Field quality control work will be performed by Buyer's installation contractor, except as otherwise required by specified Manufacturer's Special Services.

3.04 MANUFACTURER'S SPECIAL SERVICES

- A. Manufacturer's Representative for pumps and motors present at Site or classroom designated by Buyer, for minimum person-days listed below, travel time excluded:
 - 1. 4 person-days for installation assistance and inspection.
 - 2. 2 person-days for functional and performance testing and completion of Manufacturer's Certificate of Proper Installation.
 - 3. 1 person-day for post-startup training of Buyer's personnel.

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B. See Section 01 43 34, Special Services.

3.05 SUPPLEMENTS

A. The supplement listed below, following “End of Section,” is part of this Specification.

1. Irrigation Supply Pump Motor Data Sheet.

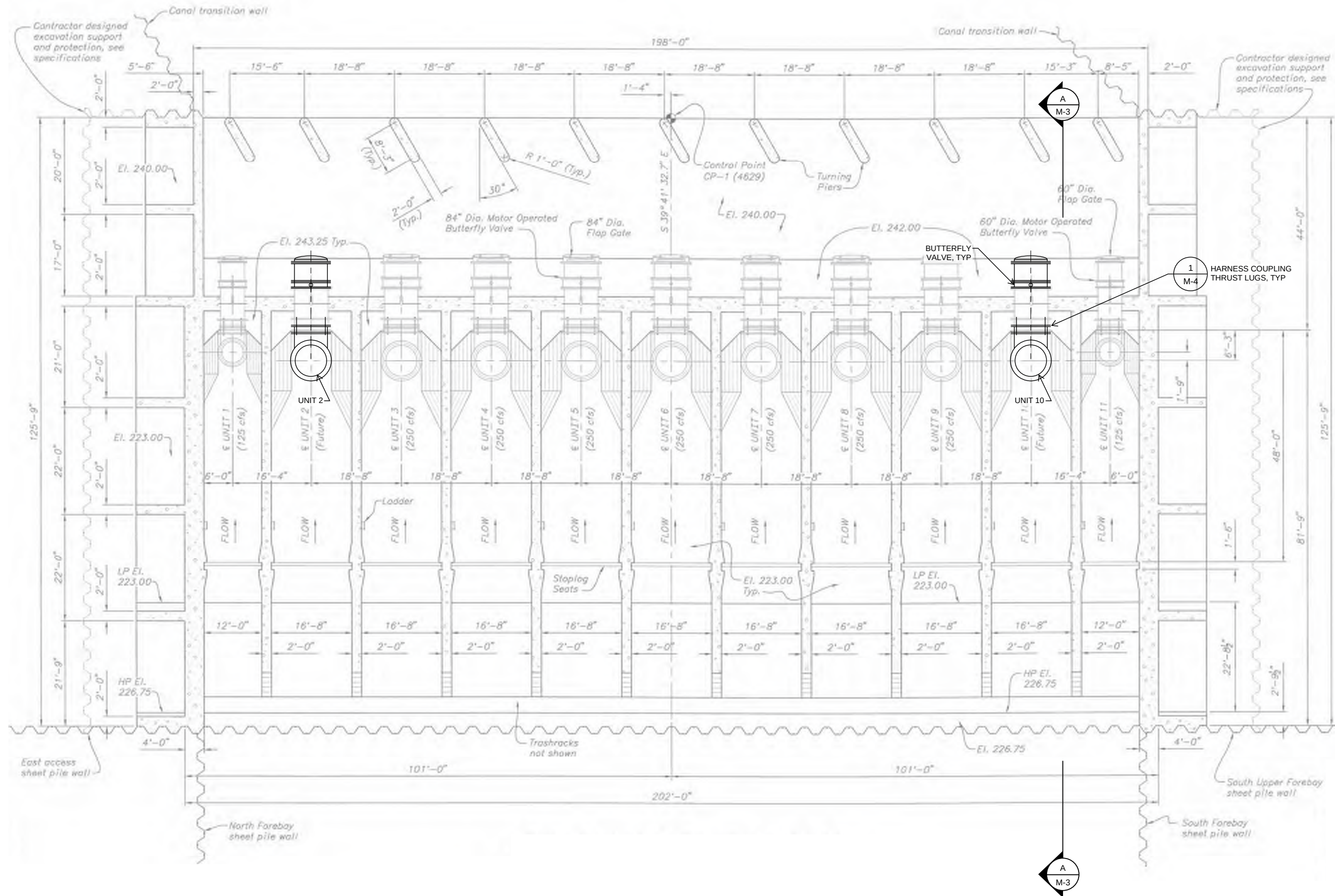
END OF SECTION

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IRRIGATION SUPPLY PUMP MOTOR DATA SHEET	
Project: <u>Red Bluff Pumping Plant Improvements Project</u>	
Buyer: <u>Tehama-Colusa Canal Authority</u>	
Equipment Name: <u>Irrigation Supply Pump Motor</u>	
Equipment Tag Number(s): <u>Unit 2, Unit 10</u>	
Type: <u>Squirrel-cage induction meeting requirements of NEMA MG 1</u>	
Hazardous Location: ☐ Furnish motors for hazardous (classified) locations that conform to UL 674 and have an applied UL listing mark	
Motor Horsepower: <u>600</u>	Efficiency: <u>In accordance with Section 26 19 00</u>
Voltage: <u>4,000</u>	Power Factor: <u>In accordance with Section 26 19 00</u>
Full Load Amperage: <u>Not greater than 132</u>	Service Factor (@ rated max. amb. temp.): <u>See Special Features below</u>
	Enclosure Type: <u>WP-II</u>
Phase: <u>3</u>	Mounting Type: ☐ Horizontal ☒ Vertical
Frequency: <u>60 Hz</u>	☒ Vertical Shaft: ☒ Solid ☐ Hollow
Synchronous Speed: <u>327</u>	Vertical Thrust Capacity: <u>As required for the application.</u>
☐ Multispeed, Two-Speed: _____ / _____ rpm	
☐ Constant Horsepower	☒ Variable Frequency Drive
☒ Variable Torque	Operating Speed Range: <u>60% to 100%</u> of Rated Speed
☐ Constant Torque	☒ Thermal Protection: <u>RTDs in accordance with Section 26 19 00</u>
Winding: ☒ One ☐ Two	☒ Space Heater: <u>120</u> volts, single phase
☒ Class F Insulation	☒ Oversize main terminal (conduit) box for motors
☒ Premium Efficiency	☒ Terminal for connection of equipment grounding wire in each terminal box
Rated Ambient Temperature ☐ 40°C ☒ 50°C	☒ Non-reverse ratchet
Special Features: 1) <u>See Section 26 19 00, Medium-Voltage Induction Motors.</u> 2) <u>Provide inverter duty-rated motors.</u> 3) <u>Service Factor at Rated Ambient Temperature: 1.15 on sine wave power / 1.0 on inverter power.</u>	

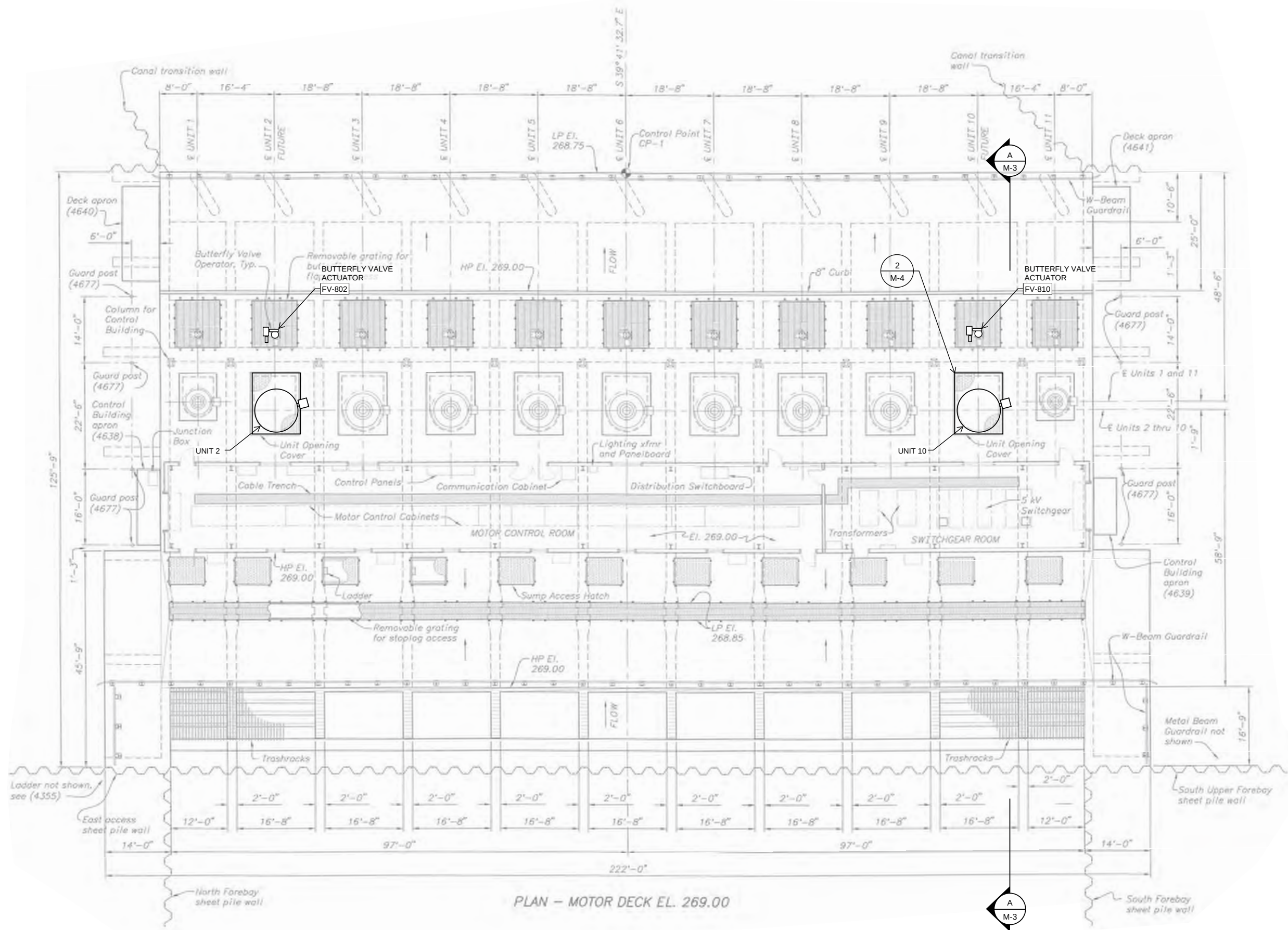
PART 4

FIGURES



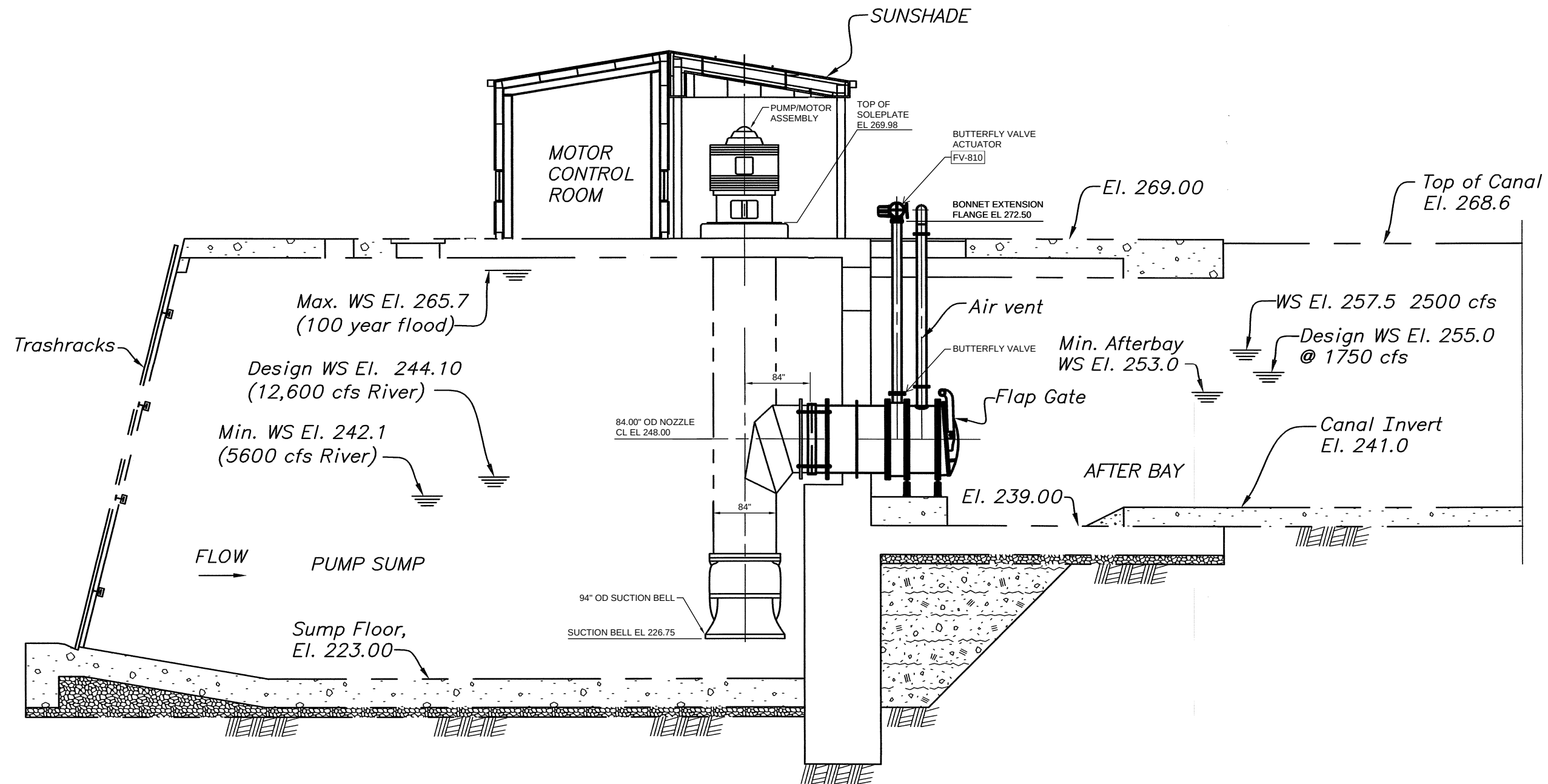
LOWER PLAN
NTS

FIGURE
M-1



UPPER PLAN
NTS

FIGURE
M-2



SECTION
A
NTS
M-1
M-2

FIGURE
M-3

1 **DETAIL**
NTS
M-1

PLAN VIEW

2 **DETAIL**
AS SHOWN
M-2