



Mahler Water Reclamation Facility (MWRF) Interim Improvements

ADDENDUM NO. 1

FOR

OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

To: All Prospective Bidders

The following clarifications, changes, additions and/or deletions are hereby made a part of the Contract Documents issued for the above referenced project as fully and completely as if the same were fully set forth therein.

This Addendum consists of 285 pages, including this cover page.

CHANGES

The Contract Documents Shall be replaced in their entirety with the attached updated Contract Documents.

End of Addendum No. 1

Mr. Greg Springman, Public Works Director

December 20, 2022

Date

City of Sweet Home

1400 24th Avenue
Sweet Home, OR 97386

Mahler Water Reclamation Facility (MWRF) Interim Improvements

Owner-Provided Dewatering Equipment Procurement Bid Documents

Document for the Provision of
Goods and Special Services

December 2022



**5 Centerpointe Dr #130,
Lake Oswego, OR 97035**
(530) 756-5905
FAX (530) 756-5991

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ADVERTISEMENT FOR BIDS
CITY OF SWEET HOME, OREGON
MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

General Notice

City of Sweet Home (Owner) is requesting Bids for the construction of the following Project:

MAHLER WATER RECLAMATION FACILITY
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

Bids for the construction of the Project will be received at Sweet Home City Hall located at 3225 Main Street, Sweet Home, OR 97386, until **January 10, 2023 at 2:00 pm** local time. At that time the Bids received will be publicly opened and read.

The Project includes the following Work:

Improvements and modifications to the City of Sweet Home Mahler Water Reclamation Facility (Mahler WRF) includes furnishing all labor, materials, and equipment necessary for the procurement of new dewatering screw press, conveyor, polymer blending unit and associated appurtenances.

Obtaining the Bidding Documents

The Contract Documents may be examined at Sweet Home City Hall. Electronic copies of the Contract Documents will be provided by the Owner. Hard copies of the Contract Documents will be provided to the successful Bidder following Bid Award.

Instructions to Bidders

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders included in the Bidding Documents.

American Iron and Steel

Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All iron and steel products used in this project must be produced in the United States. The term "iron and steel products" means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials.

The following waivers apply to this Contract:

1. De Minimis,
2. Minor Components, and
3. Pig iron and direct reduced iron.

This Advertisement is issued by:

Owner: **City of Sweet Home, Oregon**

By: **Greg Springman**

Title: **Public Works Director**

Date: **December 15, 2022**

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INSTRUCTIONS TO BIDDERS FOR PROCUREMENT CONTRACT

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ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective Bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.
- 2.06 *Electronic Documents*
- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of

the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

- B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.
- C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.
 - 1. Electronic Documents that are available in native file format include:
 - a. Electronic Drawing files in Revit, AutoCAD MEP and AutoCAD Civil3D.
 - b. Digital Elevation Model (DEM) for the construction site
 - 2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.
 - 3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.
 - 4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—RESERVED

ARTICLE 4—RESERVED

ARTICLE 5—SITE AND OTHER AREAS OWNER'S SAFETY PROGRAM

5.01 *Site and Other Areas*

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

5.02 *Owner's Safety Program*

- A. Site visits and work at the Site is governed by Oregon OSHA requirements.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

- A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.
- B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

- 7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.
- 7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Owner and Engineer in writing.
- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.
- 7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5% percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 5.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents. Bid security must be at least 5% of the Bidder's maximum price.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.
- 9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND “OR EQUAL” ITEMS

- 10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or “or-equal” items.
- 10.02 All prices that Bidder sets forth in its Bid will be based on the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda.

ARTICLE 11—RESERVED

ARTICLE 12—PREPARATION OF BID

- 12.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
 - B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
 - C. Bidders shall provide pricing for all “A-listed” or first-named equipment suppliers in the Bid Form.
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.
- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.
- 12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.
- 12.06 A Bid by an individual must show the Bidder's name and official address.
- 12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.
- 12.08 All names must be printed in ink below the signatures.
- 12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.
- 12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.
- 12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

- A. Bidders must submit a Bid on a lump sum basis for each bid item as set forth in the Bid Form.

13.02 *Additive and Deductive Unit Price Work Bid Items*

- A. Bidders must submit unit prices for bid items with additional work beyond the quantities included in the Lump Sum Bid.
 - 1. Additive and Deductive Unit Price Work Items shall include:
 - a. None
- B. Costs for Additive and Deductive Unit Price Work Bid Items will be considered by the Owner in the evaluation of bids based on the potential impact of increased or decreased quantities for these Bid items in the course of executing the Work.
- C. Bidders shall not unbalance bids for Additive and Deductive Unit Price Work Items.

13.03 Allowances

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

ARTICLE 14—SUBMITTAL OF BID

- 14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, the name and address of Bidder, the date of opening, the applicable words "SEALED BID" and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED" A mailed Bid must be addressed to the location designated in the Advertisement.
- 14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.
- 14.04 All responses submitted are the property of the City of Sweet Home, thus subject to disclosure pursuant to Oregon Public Records law, as qualified by ORS 279B.060(6) for similar contracts. Except for information marked "Proprietary", all documents received by City shall be available for public disclosure. The City will attempt to maintain the confidentiality of materials marked "Proprietary" to the extent permitted under the Oregon Public Records law. By responding to this solicitation, Bidders waive any challenge to the City's decisions in this regard.
- 14.05 **Marking all, or substantially all, or your response as "Proprietary" is not permitted and may be grounds for the City considering your bid nonresponsive, at the City's sole discretion.** If your response contains proprietary information protected under this section, please provide an additional redacted copy.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid,

and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

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

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.
- 18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.
- 18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.
- 18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.
- 18.05 *Evaluation of Bids*
- A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. For determination of the apparent lowest responsive and responsible Bidder, Bids will be compared on the basis of the Lump Sum Price along with potential additional costs for Additive or Deductive Additional Work Bid Items determined at the Owner's discretion.
- 18.06 *Protests of Solicitation*
- A. Bidders are directed to the protest procedures contained in ORS 279B.405 and OAR 137-047-0730. A prospective Bidder may file a protest of the solicitation if the prospective Bidder believes that the procurement process is contrary to law or that a solicitation document is unnecessarily restrictive, is legally flawed or improperly specifies a brand name. Protests shall be submitted to the City in writing no later than ten (10) days prior to the solicitation closing date.

18.07 *Protests of Contract Award*

- A. Bidders are directed to the protest procedures contained in ORS 279B.410 and OAR 137-047-0740. A Bidder may protest the award of a public contract or a notice of intent to award a public contract, whichever occurs first, if:
 - 1. The bidder is adversely affected because the bidder would be eligible to be awarded the public contract in the event that the protest were successful; and
 - 2. The reason for the protest is that:
 - a. All lower bids or higher ranked proposals are nonresponsive;
 - b. The contracting agency has failed to conduct the evaluation of proposals in accordance with the criteria or processes described in the solicitation materials;
 - c. The contracting agency has abused its discretion in rejecting the protestor's bid or proposal as nonresponsive; or
 - d. The contracting agency's evaluation of bids or proposals or the contracting agency's subsequent determination of award is otherwise in violation of this chapter or ORS chapter 279A.
- B. Protests shall be submitted to the City in writing no later than seven (7) days following the notice of intent to award.

ARTICLE 19—BONDS AND INSURANCE

- 19.01 Article 5 of the General Conditions sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.
- 19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

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

ARTICLE 21— PREVAILING WAGES

- 21.01 The Contractor shall abide by ORS 279c.800 through 279c.870 which relate to the prevailing wage rates for the building and construction trades in the state of Oregon. These prevailing wage rates are shown in the published Oregon Bureau of Labor and Industries (BOLI) documentation, which is described in these Contract Documents. Federal Davis-Bacon act requirements also apply, as executed by the United States Department of Labor (DOL). The higher of the two wages shall be paid to all workers as applicable on this project. The Contractor shall be aware of the requirements described elsewhere in these Contract Documents. Both items are referenced and described in the Oregon DEQ form "Prevailing Wage Agreement" included in these Contract Documents, which is a form that is required to be completed by the Contractor and submitted at the time of bid placement.
- 21.02 Bidders are advised to examine and to be thoroughly familiar with such requirements. No claim for additional compensation will be allowed that is based upon a lack of knowledge of these requirements or a failure to include adequate increases in such wages over the term of this Contract in the Bidder's bid price.

ARTICLE 22— PREVAILING WAGE RATE FORMS

- 22.01 Before payment is made by the Owner of any sums due under this Contract, the Owner must receive from the Contractor and each subcontractor or agent a copy of all required BOLI & DOL forms and Weekly Certified Payrolls from the Contractor and each subcontractor or agent.
- 22.02 Upon completion of this contract, the Owner must receive from the Contractor and each subcontractor a copy of all required BOLI and DOL forms for project closeout.
- 22.03 These forms and any required affidavits will be required before any funds retained are released to the Contractor. Forms may be obtained from BOLI and DOL. In some cases fees are required to accompany forms submitted. The Contractor is responsible for payment of these fees and shall make all applications directly to BOLI/DOL. These fees shall be incidental to all bid items of this Contract.

ARTICLE 23—NONDISCRIMINATION

- 23.01 During the performance of this contract, the Contractor shall comply with all federal and state nondiscrimination laws, including, but not limited to 42 U.S.C. 12101 et seq, the Americans with Disabilities Act (ADA).

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SECTION 00 40 00 - BID FORM

(To be submitted with Bid)

**MAHLER WATER RECLAMATION FACILITY
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON**

THIS BID IS SUBMITTED TO: City of Sweet Home
Attn: Greg Springman, Public Works Director
3225 Main Street
Sweet Home, OR 97386

- 1.01** The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
- 2.01** Bidder accepts all of the terms and conditions of the Advertisement for Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.
- 2.02** Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 13.05 of the General Conditions on or before the **dates or within the number of calendar days indicated in the Agreement.**
- 2.03** Bidder agrees to complete the Work required to complete the Milestones in accordance with Article 2 of the Agreement by the dates provided in Article 2.02.
- 2.04** Bidder accepts the provisions of the Agreement as to liquidated damages as stipulated in Article 2.04 of the Agreement and in the General Conditions.
- 3.01** Refer to the Instructions to Bidders for forms and documents that must be executed in full and submitted with the bid.
- 3.02** The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, and the General Conditions.
- 3.03** In submitting this Bid, Bidder represents, as set forth in the Agreement, that:
- A. Bidder has examined and carefully studied the Bidding Documents, the other related data and documents identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

Addendum No.

Addendum Date

- B. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.
- C. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
- D. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.
- E. Bidder has correlated the information known to Bidder, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- F. Bidder has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by OWNER is acceptable to Bidder.
- G. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that 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 agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the price described in the following bid schedule within the time of completion specified in the Agreement.

BID SCHEDULE

Bidder shall submit a Bid as set forth in the Bid form. Submission of Bids on this schedule signifies Bidder's willingness to enter into a Contract for the price offered. Bidders offering a Bid on this schedule must be capable of completing the Work within the time period stated in the Agreement. OWNER may elect to any delete bid item from the work.

1.01 LUMP SUM WORK

- A. Bidder proposes and agrees to accept as full payment the following bid amount for the Mahler WRF Owner-Provided Dewatering Equipment Procurement proposed within the Bidding Documents, and certifies that this amount is based upon the undersigned's own estimate of quantities and costs and includes sales, consumer, use, and other taxes, except as provided below, overhead and profit.
- B. Lump Sum Bid Price: \$ _____

Bidder Identification and Signatures

Name of Firm: _____

Federal Tax ID No: _____

State of Incorporation and Oregon CCB License No: _____

Bidder ☐ IS / ☐ IS NOT a "Resident Bidder" as defined by ORS 279.029.

Signature and Printed Name(s): *(If Bidder is a partnership or joint venture, all parties must sign below)*

Title _____

Date _____

END OF SECTION

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ARTICLE 1— BID BOND (PENAL SUM FORM)

Bidder Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: City of Sweet Home, Oregon Address <i>(principal place of business)</i> : 3225 Main Street Sweet Home, OR 97386	Bid Project <i>(name and location)</i> : Mahler WRF Owner-Provided Dewatering Equipment Procurement 1357 Pleasant Valley Road Sweet Home, OR 97386 Bid Due Date: January 10, 2023
Bond Penal Sum: Date of Bond:	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder	Surety
_____ <i>(Full formal name of Bidder)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
 - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by Owner, or
 - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION 00 43 33- PROPOSED PRODUCTS LIST

(To be submitted with Bid)

**MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON**

The Bidder states that the manufacturer of each listed item of equipment or material proposed by the Contractor for use on this Project will be as listed below:

Material Item	Description	Equipment or Material Manufacturer (Do not show Dealer or Supplier)
1	Screw Press Dewatering Equipment (46 76 27)	
2	Shaftless Screw Conveyors (41 12 13)	
3	Polymer Blending Unit (46 33 33)	

The Bidder must include in the space provided, the name of the equipment or material manufacturer he has used in determining his Base Bid which will be used by the Successful Bidder in constructing the project. If the Bidder does not fill in any of the spaces, it will be considered that the Bidder has selected the first-named manufacturer as his selection for those spaces not filled in.

After the opening of Bids, no changes or substitutions from those listed manufacturers will be allowed without the express written approval of the Engineer. If such change is permitted by the Engineer, it will be evaluated in accordance with provisions of the Contract Documents pertaining to Specified Items/Proposed Equivalents.

Circumstances which will justify changes to the above listing are limited to the following:

1. Manufacturer is unable to meet specifications.
2. Manufacturer fails to honor original quotation upon which the Contractor's bid was based.
3. Manufacturer goes out of business or ceases to make the specified product.

It is the responsibility of the Contractor to furnish materials and equipment meeting the requirements of the Specifications, and acceptance of the bid does not constitute nor imply favorable review or approval of items proposed. The Owner reserves the right to deny approval or acceptance of any equipment or materials which do not comply with Specifications even though listed herein.

(Signature)

(Type or Print Name)

(Title)

(Company)

END OF SECTION

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SECTION 00 45 19 – NON-COLLUSION AFFIDAVIT

(To be submitted with Bid)

**MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON**

**STATE OF OREGON
COUNTY OF LINN**

I state that I am _____ (title) of _____ (name of firm) and that I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

- (1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder, except as disclosed on the attached appendix.
- (2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.
- (3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.
- (4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.
- (5) _____ (name of firm), its affiliates, subsidiaries, officers, directors and employees are not currently under investigation by any governmental agency for violating any non-collusion statutes and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described in the attached appendix.

I state that _____ (name of firm) understands and acknowledges that the above representations are material and important and will be relied on by the City of Sweet Home in awarding the contract(s) for which this bid is submitted. I understand, and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the City of Sweet Home of the true facts relating to the submission of bids for this contract.

Authorized Signature

Name of Company / Position

Sworn to and subscribed before me this _____ day of _____, 20____.

Notary Public for the State of Oregon

My Commission Expires

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P520 – AGREEMENT BETWEEN BUYER AND SELLER FOR PROCUREMENT TASK ORDER

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P520 – AGREEMENT BETWEEN BUYER AND SELLER FOR PROCUREMENT TASK ORDER

This Procurement Agreement is by and between **the City of Sweet Home** ("Buyer") and _____ ("Seller") for the Mahler Water Reclamation Facility (MWRF) Owner-Provided Dewatering Equipment Procurement.

Terms used in this Procurement Agreement have the meanings stated in the General Conditions of the Procurement Task Order and the Supplementary Conditions of the Procurement Task Order.

Buyer and Seller hereby agree as follows:

ARTICLE 1—PROCUREMENT TASK ORDER

1.01 *Goods and Special Services*

- A. Seller shall furnish the Goods and Special Services as specified or indicated in the Procurement Task Order Documents. The Goods and Special Services are generally described as follows:

1. **Goods and Special Services:** Provision of dewatering equipment including:
 - a. MWRF Dewatering Screwpress
 - b. MWRF Polymer Blending Unit
 - c. MWRF Shaftless Screw Conveyor

1.02 *The Project*

- A. The Project, of which the Goods and Special Services are a part, is generally described as follows: **Mahler Water Reclamation Facility Interim Improvements Project (Project).**

1.03 *Engineer*

- A. Buyer has retained **West Yost Associates, Inc.** ("Engineer"), to prepare Procurement Task Order Documents and act as Buyer's representative. Engineer assumes all duties and responsibilities and has the rights and authority assigned to Engineer in the Procurement Task Order Documents in connection with Seller's furnishing of Goods and Special Services.

1.04 *Point of Destination*

The Point of Destination is designated as: **Mahler Water Reclamation Facility, 1357 Pleasant Valley Road, Sweet Home, OR 97386.**

ARTICLE 2—PROCUREMENT TASK ORDER TIMES

2.01 *Time of the Essence*

- A. All time limits for Milestones, including the submittal of Shop Drawings and Samples, the delivery of Goods, and the furnishing of Special Services as stated in the Procurement Task Order Documents, are of the essence of the Procurement Task Order.

2.02 *Schedule of Procurement Task Order Times*

A. The following schedule sets forth the Procurement Task Order Times:

Milestone	Date or Days	Notes
Seller to provide MWRF Dewatering Equipment Submittals and Shop Drawings	February 9, 2023	
Freight on Board (FOB) delivery of Goods to Point of Destination	April 27, 2023	
Final Completion	June 16, 2023	

2.03 *Shop Drawings and Samples*

- A. *Submittal of Shop Drawings and Samples:* Seller shall base procurement of dewatering equipment on MWRF Owner-Provided Dewatering Equipment Procurement final Task Order documents dated January 2023.
- B. *Engineer's Review:* It is the intent of the parties that provision of Goods and Special Services under this Procurement Task Order will be based on the MWRF Owner-Provided Dewatering Equipment Procurement final Task Order documents dated January 2023 issued by the Engineer.

2.04 *Liquidated Damages*

- A. Buyer and Seller recognize that time is of the essence as stated in Paragraph 2.01, and that Buyer will suffer financial and other losses if the Goods are not delivered to the Point of Destination and ready for receipt of delivery by Buyer within the time specified in Paragraph 2.02, plus any extensions thereof allowed in accordance with this Procurement Task Order. The parties also recognize that the timely performance of services by others involved in the Project is materially dependent upon Seller's specific compliance with the delivery requirements of Paragraph 2.02. Further, the parties recognize the time, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the loss (whether direct, consequential, or otherwise) suffered by Buyer if complete, acceptable Goods are not delivered on time. Accordingly, instead of requiring any such proof, Buyer and Seller agree that as liquidated damages for delay (but not as a penalty) Seller shall pay Buyer \$200 for each Day that expires after the time specified in Paragraph 2.02 for Delivery of Goods to the Point of Destination following approval of Submittals and Shop Drawings.

ARTICLE 3—PROCUREMENT TASK ORDER PRICE

3.01 *Procurement Task Order Price and Total Price*

- A. The Procurement Task Order Price is comprised of the Lump Sum amount set forth in the following paragraphs.
- B. Buyer shall pay Seller a Lump Sum of \$_____ (_____dollars) for furnishing the Goods and Special Services (other than any Unit Price Goods and Special Services) in accordance with the Procurement Task Order Documents.

3.02 *Procurement Task Order Price and Total Price—Based on Attached Bid*

- A. For furnishing the Goods and Special Services in accordance with the Procurement Task Order Documents, Buyer shall pay Seller the prices stated in Seller's Bid, subject to final adjustments for Unit Price Goods and Special Services and Buyer's Contingency Allowance, if any, and subject to the following Buyer-accepted alternates: **No alternates.**

ARTICLE 4—PAYMENT PROCEDURES

4.01 *Submittal and Processing of Applications for Payment*

- A. Seller shall submit Applications for Payment in accordance with Article 13 of the General Conditions and the following paragraphs. Engineer and Buyer will process such Applications for Payment in accordance with said Article 13.

4.02 *Progress Payments; Final Payment*

- A. **Payment Schedule 1 for Goods:** Seller may submit an Application for Payment requesting the stated percentage of Procurement Task Order Price for the Dewatering Screwpress based upon the following Payment Line Items:

Payment Line Item (Lump Sum)	Percentage of Lump Sum
1. Engineer's Approval of Submittals and Shop Drawings	10
2. Freight on Board (FOB) delivery of Goods to Point of Destination along with provision of final Operations and Maintenance manuals, submittal of warranties and other final documentation required by the Procurement Task Order Documents.	80
3. Final Completion	10
Total Procurement Task Order Price for Goods (Lump Sum)	100

- B. Buyer shall pay Seller the amount owed under an Application for Payment within 30 days after Engineer's presentation to Buyer of the Application for Payment and Engineer's recommendation.

4.03 *Interest*

- A. All amounts not paid when due will bear interest as the rate of 6 percent per annum.

ARTICLE 5—RESERVED

ARTICLE 6—PROCUREMENT TASK ORDER DOCUMENTS

6.01 *List of Procurement Task Order Documents*

- A. The Procurement Task Order Documents consist of the following:
1. This Procurement Agreement.
 2. General Conditions of the Procurement Task Order.

3. Bonds:
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
4. Exhibits to this Procurement Agreement (enumerated as follows):
 - a. Drawings:
 - 1) G-000: Cover Sheet, Vicinity and Location Maps
 - 2) C-010: Overall Site Plan and Staging Areas Plan
 - 3) C-020: Solids Area Detail Plan
 - 4) I-001: Legend, Symbols and Abbreviations 1
 - 5) I-002: Legend, Symbols and Abbreviations 2
 - 6) I-251: Solids Dewatering P&ID
 - 7) I-252: Solids Dewatering P&ID 2
 - 8) I-253: Polymer Makedown P&ID
 - b. Technical Specifications
5. The following which may be delivered or issued on or after the Effective Date of the Procurement Task Order and are not attached hereto:
 - a. Change Orders;
 - b. Change Directives; and
 - c. Field Orders.
- B. The documents listed in Paragraph 6.01.A are attached to this Procurement Agreement (except as expressly noted otherwise above).
- C. There are no Procurement Task Order Documents other than those listed above.
- D. The Procurement Task Order Documents may only be amended or supplemented as provided in Paragraph 11.01 of the Procurement General Conditions.

ARTICLE 7—SELLER’S REPRESENTATIONS AND CERTIFICATIONS

7.01 *Seller’s Representations*

- A. In order to induce Buyer to enter into this Procurement Agreement, Seller makes the following representations:
 1. Seller has examined and carefully studied the Procurement Task Order Documents.
 2. If required by the Instructions to Bidders to visit the Point of Destination and the site where the Goods are to be installed or Special Services will be provided, or if, in Seller’s judgment, any observable local or site conditions may affect the delivery, cost, progress, or furnishing of the Goods and Special Services, then Seller has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided (as applicable) and become familiar with and is satisfied as to the observable

local and site conditions that may affect delivery, cost, progress, and furnishing of the Goods and Special Services.

3. Seller is familiar with and is satisfied as to all Laws and Regulations that may affect the cost, progress, and performance of Seller's obligations under the Procurement Task Order.
4. Seller has carefully studied, considered, and correlated the information known to Seller with respect to the effect of such information on the cost, progress, and performance of Seller's obligations under the Procurement Task Order.
5. Seller has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Seller has discovered in the Procurement Task Order Documents, and the written resolution (if any) thereof by Engineer is acceptable to Seller.
6. The Procurement Task Order Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance of Seller's obligations under the Procurement Task Order.
7. Seller's entry into this Procurement Task Order constitutes an incontrovertible representation by Seller that without exception all prices in the Procurement Agreement are premised upon furnishing the Goods and Special Services as required by the Procurement Task Order Documents.

7.02 *Seller's Certifications*

- A. Seller certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Procurement Task Order. For the purposes of this Paragraph 7.02:
 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Procurement Task Order execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Procurement Task Order to the detriment of Buyer, (b) to establish bid or Task Order prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Procurement Task Order.

ARTICLE 8—RESERVED

ARTICLE 9—MUTUAL WAIVER

9.01 *Mutual Waiver of Consequential Damages*

- A. Buyer and Seller waive against each other, and against the other's officers, directors, members, partners, employees, agents, consultants, and subcontractors, any and all claims for or entitlement to incidental, indirect, or consequential damages arising out of, resulting from, or related to the Procurement Task Order. If Buyer (Project Owner) assigns this Procurement Task Order to a construction contractor (Contractor/Assignee), then the terms of this Paragraph 9.01.A will be binding upon the Contractor/Assignee with respect to Seller and assignor. The terms of this mutual waiver do not apply to or limit any claim by either Buyer or Seller against the other based on any of the following: (a) contribution or indemnification, (b) liquidated damages, (c) costs, losses, or damages attributable to personal or bodily injury, sickness, disease, or death, or to injury to or destruction of the tangible property of others, (d) intentional or reckless wrongful conduct, or (e) rights conferred by any bond provided by Seller under this Procurement Task Order.

IN WITNESS WHEREOF, Buyer and Seller have signed this Procurement Agreement. Counterparts have been delivered to Buyer and Seller.

The Effective Date of the Procurement Task Order is .

Buyer

Seller

(typed or printed name of organization)

(typed or printed name of organization)

By: _____
(individual's signature)

By: _____
(individual's signature)

Date: _____
(date signed)

Date: _____
(date signed)

Name: _____
(typed or printed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

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

Attest: _____
(individual's signature)

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

Address for giving notices:

Address for giving notices:

Designated Representative:

Designated Representative:

Name: _____
(typed or printed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

Address:

Phone: _____

Phone: _____

Email: _____

Email: _____

(If 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 this Agreement.)

P610 – PERFORMANCE BOND FOR PROCUREMENT TASK ORDER

Seller Name: _____ Address <i>(principal place of business)</i> : _____	Surety Name: _____ Address <i>(principal place of business)</i> : _____
Buyer Name: City of Sweet Home Mailing address <i>(principal place of business)</i> : 1400 24th Ave Sweet Home, OR 97386	Procurement Contract Description <i>(name and location)</i>: furnishing dewatering equipment Project: Mahler WRF Interim Improvements Project – Owner Provided Dewatering Equipment Procurement Point of Destination: 1357 Pleasant Valley Road, Sweet Home, OR 97386 Procurement Contract Price: \$ _____ Effective Date of Procurement Contract: _____
Bond Bond Amount: \$ _____ Date of Bond: _____ <i>(Date of Bond cannot be earlier than Effective Date of Procurement Contract)</i> Modifications to this Bond form: ☒ None ☐ See Paragraph 15	
Surety and Seller, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.	
Seller as Principal	Surety
_____ <i>(Full formal name of Seller)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Seller, Surety, Buyer, or other party is considered plural where applicable.</i>	

1. The Seller and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Buyer for the performance of the Procurement Task Order, which is incorporated herein by reference.
2. If the Seller performs the Procurement Task Order, the Surety and the Seller shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Buyer Default under the Procurement Task Order, the Surety's obligation under this Bond will arise after:
 - 3.1. The Buyer first provides notice to the Seller and the Surety that the Buyer is considering declaring a Seller Default. Such notice may indicate whether the Buyer is requesting a conference among the Buyer, Seller, and Surety to discuss the Seller's performance. If the Buyer does not request a conference, the Surety may, within five (5) business days after receipt of the Buyer's notice, request such a conference. If the Surety timely requests a conference, the Buyer shall attend. Unless the Buyer agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Buyer's notice. If the Buyer, the Seller, and the Surety agree, the Seller shall be allowed a reasonable time to perform the Procurement Task Order, but such an agreement does not waive the Buyer's right, if any, subsequently to declare a Seller Default;
 - 3.2. The Buyer declares a Seller Default, terminates the Procurement Task Order, and notifies the Surety; and
 - 3.3. The Buyer has agreed to pay the Balance of the Procurement Task Order Price in accordance with the terms of the Procurement Task Order to the Surety or to a seller selected to perform the Procurement Task Order.
4. Failure on the part of the Buyer to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Buyer has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1. Arrange for the Seller, with the consent of the Buyer, to perform and complete the Procurement Task Order;
 - 5.2. Undertake to perform and complete the Procurement Task Order itself, through its agents or independent contractors;
 - 5.3. Obtain bids or negotiated proposals from qualified sellers acceptable to the Buyer for a Task Order for performance and completion of the Procurement Task Order, arrange for a Task Order to be prepared for execution by the Buyer and a seller selected with the Buyer's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Procurement Task Order, and pay to the Buyer the amount of damages as described in Paragraph 7 in excess of the Balance of the Procurement Task Order Price incurred by the Buyer as a result of the Seller Default; or
 - 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new seller, and with reasonable promptness under the circumstances:
 - 5.4.1. After investigation, determine the amount for which Surety may be liable to the Buyer and, as soon as practicable after the amount is determined, make payment to the Buyer; or

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

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven (7) days after receipt of an additional written notice from the Buyer to the Surety demanding that the Surety perform its obligations under this Bond, and the Buyer shall be entitled to enforce any remedy available to the Buyer. If the Surety proceeds as provided in Paragraph 5.4, and the Buyer refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Buyer shall be entitled to enforce any remedy available to the Buyer.
7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Buyer will not be greater than those of the Seller under the Procurement Task Order, and the responsibilities of the Buyer to the Surety will not be greater than those of the Buyer under the Procurement Task Order. Subject to the commitment by the Buyer to pay the Balance of the Procurement Task Order Price, the Surety is obligated, without duplication for:
 - 7.1. the responsibilities of the Seller for correction of defective or non-conforming Goods and Special Services, and completion of the Procurement Task Order;
 - 7.2. additional legal, design professional, and delay costs resulting from the Seller's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Procurement Task Order, actual damages caused by delayed performance or non-performance of the Seller.
8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
9. The Surety shall not be liable to the Buyer or others for obligations of the Seller that are unrelated to the Procurement Task Order, and the Balance of the Procurement Task Order Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Buyer or its heirs, executors, administrators, successors, and assigns.
10. The Surety hereby waives notice of any change, including changes of time, to the Procurement Task Order or to related subcontracts, purchase orders, and other obligations.
11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction where the Point of Destination is located and must be instituted within two years after a declaration of Seller Default, or within two years after the Seller ceased working, or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.
12. Notice to the Surety, the Buyer, or the Seller must be mailed or delivered to the address shown on the page on which their signature appears.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Point of Destination, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

- 14.1. *Balance of the Procurement Task Order Price*—The total amount payable by the Buyer to the Seller under the Procurement Task Order after all proper adjustments have been made including allowance for the Seller for any amounts received or to be received by the Buyer in settlement of insurance or other claims for damages to which the Seller is entitled, reduced by all valid and proper payments made to or on behalf of the Seller under the Procurement Task Order.
- 14.2. *Buyer Default*—Failure of the Buyer, which has not been remedied or waived, to pay the Seller as required under the Procurement Task Order or to perform and complete or comply with the other material terms of the Procurement Task Order.
- 14.3. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, as defined in the Procurement Task Order.
- 14.4. *Point of Destination*—The location where delivery of the Goods shall be made, as stated in the Procurement Task Order.
- 14.5. *Procurement Task Order*—The contractual agreement between the Buyer and Seller identified on the cover page, including all Procurement Task Order Documents and changes made to the Procurement Contract.
- 14.6. *Seller Default*—Failure of the Seller, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Procurement Task Order.
- 14.7. *Procurement Task Order Documents*—All the documents that comprise the contractual agreement between the Buyer and Seller.

15. Modifications to this Bond are as follows: **None**

P615 – PAYMENT BOND FOR PROCUREMENT TASK ORDER

Seller Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Buyer Name: City of Sweet Home Mailing address <i>(principal place of business)</i> : 1400 24th Ave Sweet Home, OR 97386	Procurement Task Order Description <i>(name and location)</i>: furnishing dewatering equipment Project: Mahler WRF Interim Improvements Project – Owner Provided Dewatering Equipment Procurement Point of Destination: 1357 Pleasant Valley Road, Sweet Home, OR 97386 Procurement Task Order Price: \$ Effective Date of Procurement
Bond Bond Amount: \$ Date of Bond: <i>(Date of Bond cannot be earlier than Effective Date of Procurement Task Order)</i> Modifications to this Bond form: ☐ None ☐ See Paragraph 17	
Surety and Seller, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.	
Seller as Principal	Surety
<i>(Full formal name of Seller)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Seller, Surety, Buyer, or other party is considered plural where applicable.</i>	

1. The Seller and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Buyer to pay for labor, materials, and equipment furnished for use in the performance of the Procurement Task Order, which is incorporated herein by reference, subject to the following terms.
2. If the Seller promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Buyer from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Procurement Task Order, then the Surety and the Seller shall have no obligation under this Bond.
3. If there is no Buyer Default under the Procurement Task Order, the Surety's obligation to the Buyer under this Bond will arise after the Buyer has promptly notified the Seller and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Buyer or the Buyer's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Procurement Task Order, and tendered defense of such claims, demands, liens, or suits to the Seller and the Surety.
4. When the Buyer has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Buyer against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
 - 5.1. Claimants who do not have a direct Task Order with the Seller
 - 5.1.1. have furnished a written notice of non-payment to the Seller, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2. Claimants who are employed by or have a direct Task Order with the Seller have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Buyer to the Seller, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1. Send an answer to the Claimant, with a copy to the Buyer, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2. Pay or arrange for payment of any undisputed amounts.
 - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Seller may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Buyer to the Seller under the Procurement Task Order will be used for the performance of the Procurement Task Order and to satisfy claims, if any, under any procurement performance bond. By the Seller furnishing and the Buyer accepting this Bond, they agree that all funds earned by the Seller in the performance of the Procurement Task Order are dedicated to satisfying obligations of the Seller and Surety under this Bond, subject to the Buyer's priority to use the funds for the completion of the Goods and Special Services.
10. The Surety shall not be liable to the Buyer, Claimants, or others for obligations of the Seller that are unrelated to the Procurement Task Order. The Buyer shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Procurement Task Order or to related subcontracts, purchase orders, and other obligations.
12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the Point of Destination is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Procurement Task Order, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
13. Notice and Claims to the Surety, the Buyer, or the Seller must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement where the Point of Destination is located, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Seller and Buyer shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

16.1. *Buyer Default*—Failure of the Buyer, which has not been remedied or waived, to pay the Seller as required under the Procurement Task Order or to perform and complete or comply with the other material terms of the Procurement Task Order.

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

16.2.1. The name of the Claimant;

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

16.2.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Procurement Task Order;

- 16.2.4. A brief description of the labor, materials, or equipment furnished;
 - 16.2.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Procurement Task Order;
 - 16.2.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 - 16.2.7. The total amount of previous payments received by the Claimant; and
 - 16.2.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
- 16.3. *Claimant*—An individual or entity having a direct Task Order with the Seller or with a subcontractor of the Seller to furnish labor, materials, or equipment for use in the performance of the Procurement Task Order. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic’s lien or similar statute against the real property upon which the Point of Destination is located or where the Goods and Special Services are to be installed or furnished. The intent of this Bond is to include without limitation in the terms of “labor, materials, or equipment” that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Procurement, architectural and engineering services required for performance of the work of the Seller and the Seller’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 16.4. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, as defined in the Procurement Task Order.
- 16.5. *Point of Destination*—The location where delivery of the Goods shall be made, as stated in the Procurement Task Order.
- 16.6. *Procurement Task Order*—The contractual agreement between the Buyer and Seller identified on the cover page, including all Procurement Task Order Documents and all changes made to the Procurement Task Order.
- 16.7. *Procurement Task Order Documents*—All the documents that comprise the contractual agreement between the Buyer and Seller.
17. Modifications to this Bond are as follows: **None**

P625 – BUYER’S ACKNOWLEDGMENT OF RECEIPT OF GOODS

Buyer:	City of Sweet Home	Buyer’s Project No.:	
Engineer:	West Yost Associates	Engineer’s Project No.:	936-50-21-09
Seller:		Seller’s Project No.:	
Project:	Mahler Water Reclamation Facility Interim Improvements Project		
Contract Name:	Mahler WRF Owner-Provided Dewatering Equipment Procurement		

This Buyer’s Acknowledgment of Receipt of Goods (Acknowledgment) applies to:

☐ All Goods ☐ The following specified portions of the Goods: **[Specify]**

Date of delivery of the Goods to the Point of Destination: **[Date]**

Date of Buyer’s visual inspection of the Goods: **[Date]**

Date of this Acknowledgment: **[Date]**

Buyer acknowledges:

1. The Goods to which this notice applies have been delivered to the Point of Destination.
2. Buyer has visually inspected such Goods pursuant to Paragraph 9.02.B.1 of the General Conditions of the Procurement Contract.
3. Based on the visual inspection, such Goods appear to comply with the requirements of the Procurement Contract Documents as to quantities and condition, subject to any exceptions and limitations in this Acknowledgment.
4. Such Goods are deemed received for purposes of Paragraph 9.02.B.2 of the General Conditions of the Procurement Contract.
5. Seller may submit its Application for Payment for the delivered Goods, subject to the terms of the Procurement Agreement.

Exceptions (if any) to this Acknowledgment: ☐ None ☐ As follows:

The responsibilities between Buyer and Seller for securing and storing the Goods, maintaining the Goods during storage, and for furnishing the Special Services, shall be as provided in the Procurement Contract.

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

[List, if any, or indicate None]

This Acknowledgment does not constitute an acceptance of any Goods not in conformance with the Procurement Contract Documents, nor is it a release of Seller's obligation to furnish all Goods and Special Services in accordance with the Procurement Contract.

Buyer

By (signature): _____

Name (Printed): _____

Title: _____

Date: _____

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P700 – STANDARD GENERAL CONDITIONS OF THE PROCUREMENT TASK ORDER

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ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Whenever used in the Procurement Bidding Requirements or Procurement Task Order 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 Procurement Task Order 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 Procurement Task Order Documents.
 2. *Application for Payment*—The document prepared by Seller, in a form acceptable to Buyer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Procurement Task Order Documents.
 3. *Bid*—An offer or proposal of a prospective Seller submitted on the prescribed form setting forth the prices for the Goods and Special Services to be provided.
 4. *Bidder*—An individual or entity that, as a prospective Seller, submits a Bid to Buyer.
 5. *Buyer*—The individual or entity purchasing the Goods and Special Services, which is the City of Sweet Home.
 6. *Change Directive*—A written directive from Buyer to Seller issued on or after the Effective Date of the Procurement Task Order, ordering an addition, deletion, or revision in the Goods and Special Services.
 7. *Change Order*—A document which is signed by Seller and Buyer and authorizes an addition, deletion, or revision to the Procurement Task Order Documents or an adjustment in the Procurement Task Order Price or the Procurement Task Order Times, issued on or after the Effective Date of the Procurement Task Order. Change Orders may be the result of mutual agreement by Buyer and Seller, or of resolution of a Claim.
 8. *Claim*—A demand or assertion by Buyer or Seller seeking an adjustment of Procurement Task Order Price or Procurement Task Order Times, or both, or other relief with respect to the terms of the Procurement Task Order. A demand for money or services by a third party is not a Claim.
 9. *Days* – shall be defined as a calendar day.
 10. *Effective Date of the Procurement Task Order*—The date indicated in the Procurement Agreement on which the Procurement Task Order becomes effective.
 11. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
 12. *Electronic Means*—Electronic mail (e-mail), upload/download from a secure Project website, or other communications methods that allow: the transmission or communication of Electronic Documents; the documentation of transmissions,

including sending and receipt; printing of the transmitted Electronic Document by the recipient; the storage and archiving of the Electronic Document by sender and recipient; and the use by recipient of the Electronic Document for purposes permitted by this Procurement Task Order. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

13. *Engineer*—The individual or entity designated as such in the Procurement Agreement, which is West Yost Associates, Inc.
14. *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 Procurement Task Order Price or Procurement Task Order Times.
15. *Goods*—The tangible and movable personal property that is described in the Procurement Task Order Documents, regardless of whether the property is to be later attached to realty.
16. *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.
17. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
18. *Milestone*—A principal event specified in the Procurement Task Order that Seller must attain by the date or within the number of days indicated, including but not limited to the delivery of the Goods and the furnishing of Special Services.
19. *Notice of Award (NOA)* —The written notice, by Buyer to a Bidder, of Buyer’s acceptance of the Bid.
20. *Notice to Proceed (NTP)* — The written notice, by Buyer to Seller, directing Seller to begin activities associated the Task Order.
21. *Oregon Business Development Department (OBDD)* –lending agencies providing funding for the Project, otherwise known as the Oregon Infrastructure Finance Authority of the Business Development Department.
22. *Operations Contractor* — the third-party company responsible for operating the facilities, which is Delta Environmental, Inc.
23. *Oregon Health Authority (OHA)* — regulatory agency responsible for public health systems in the State of Oregon.
24. *Oregon Revised Statutes (ORS)* – laws and regulations in the State of Oregon, which shall be the governing rules related to the Project.
25. *Point of Destination*—The specific address of the location where delivery of the Goods will be made, as stated in the Procurement Agreement.
26. *Procurement Agreement*—The written instrument, executed by Buyer and Seller, that sets forth the Procurement Task Order Price and Procurement Task Order Times,

identifies the parties and the Engineer, and designates the specific items that are Procurement Task Order Documents.

27. *Procurement Bidding Documents*—The Procurement Bidding Requirements and the proposed Procurement Task Order Documents (including all Addenda).
28. *Procurement Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and Bid Form with any supplements.
29. *Procurement Task Order*—The entire and integrated written agreement between Buyer and Seller concerning the Goods and Special Services.
30. *Procurement Task Order Documents*—Those items so designated in the Procurement Agreement, and which together comprise the Procurement Task Order. Shop Drawings and other Seller submittals are not Procurement Task Order Documents, even if accepted, reviewed, or approved by Engineer or Buyer.
31. *Procurement Task Order Price*—The money that Buyer has agreed to pay Seller for furnishing the Goods and Special Services in accordance with the Procurement Task Order Documents.
32. *Procurement Task Order Times*—The times stated in the Procurement Agreement by which the Goods must be delivered, Special Services must be furnished, and other Milestones must be attained.
33. *Procurement Drawings*—That part of the Procurement Task Order 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 Procurement Drawings as so defined.
34. *Procurement Specifications*—That part of the Procurement Task Order 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.
35. *Project*—The total undertaking to be accomplished for Project Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Goods and Special Services are a part.
36. *Project Owner*—The entity that has retained (or will retain) engineers, contractors, and others for the planning, study, design, construction, testing, commissioning, and start-up of facilities and improvements. As of the Effective Date of the Procurement Contract, the Project Owner is the Buyer.
37. *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.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Seller, of required Submittals and the time requirements for Engineer's review of the Submittals.
39. *Seller*—The individual or entity furnishing the Goods and Special Services.
40. *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. Shop Drawings, whether approved or not, are not Procurement Drawings and are not Procurement Task Order Documents.

41. *Special Services*—Services to be performed by Seller (or its agents or subcontractors) in association with the Goods to be furnished by Seller, as required by the Procurement Task Order Documents.
42. *Submittal*—A written or graphic document, prepared by or for Seller, which the Procurement Task Order Documents require Seller to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or site quality-control testing and inspections; warranties and certifications; suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; record documents; and other such documents required by the Procurement Task Order Documents. Submittals, whether or not approved or accepted by Engineer, are not Procurement Task Order Documents. Change proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
43. *Successful Bidder*—The Bidder whose Bid the Buyer accepts, and to which Buyer makes an award of the Procurement Task Order.
44. *Supplementary Conditions*—The part of the Procurement Task Order that amends or supplements these General Conditions.
45. *TBD*— "to be determined"
46. *Unit Price Goods and Special Services*—Goods and Special Services to be paid for on the basis of unit prices (if any).
47. *United States*— each of the several states, the District of Columbia, and each Federally Recognized Indian Tribe.

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 Procurement Task Order Documents.
- B. *Intent of Certain Terms or Adjectives*
 1. The Procurement Task Order 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 Procurement Task Order Documents and conformance with the design concept of the completed Project as a functioning whole, as shown or indicated in the Procurement

Task Order Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective will 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 Procurement Task Order 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 are unsatisfactory, faulty, or deficient in that they:
 - a. do not conform to or comply with the requirements of the Procurement Task Order Documents;
 - b. do not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Procurement Task Order Documents; or
 - c. in the case of Special Services, have not been completed.
 3. The word “receipt” when referring to the Goods, means the physical taking and possession by the Buyer under the conditions specified in Paragraph 9.02.B.2.
 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 means 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 Procurement Task Order Documents.
- C. *Procurement Task Order Price or Procurement Task Order Times:* References to a change in “Procurement Task Order Price or Procurement Task Order Times” or “Procurement Task Order Times or Procurement Task Order Price” or similar, indicate that such change applies to (1) Procurement Task Order Price, (2) Procurement Task Order Times, or (3) both Procurement Task Order Price and Procurement Task Order Times, as warranted, even if the term “or both” is not expressed.
- D. Unless stated otherwise in the Procurement Task Order Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Procurement Task Order Documents in accordance with such recognized meaning.

1.03 *Defined Terms Related to American Iron and Steel*

- A. American Iron and Steel (AIS) - Requirements mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference for “iron and steel products,” meaning the following products, if made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials. AIS requirements apply in each of the several states, the District of Columbia, and each federally recognized Tribe, but not the U.S. Territories.
- B. Coating - A covering that is applied to the surface of an object. If a Coating is applied to the external surface of a domestic iron or Steel component, and the application takes place

outside of the United States, said product would be considered a compliant product under the AIS requirements. Any Coating processes that are applied to the external surface of Iron and Steel components that would otherwise be AIS compliant would not disqualify the product from meeting the AIS requirements regardless of where the Coating processes occur, provided that final assembly of the product occurs in the United States. This exemption only applies to Coatings on the external surface of Iron and Steel components. It does not apply to Coatings or linings on internal surfaces of Iron and Steel products, such as the lining of lined pipes. All Manufacturing Processes for lined pipes, including the application of pipe lining, must occur in the United States for the product to be compliant with AIS requirements.

- C. Construction Materials - Those articles, materials, or supplies made primarily of iron and/or steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered “structural steel”. Note: Mechanical and electrical components, equipment and systems are not considered Construction Materials. See definitions of Mechanical Equipment and Electrical Equipment.
- D. Seller’s Certification - Documentation submitted by the Seller that all Iron and Steel products installed were Produced in the United States.
- E. De Minimis - Various miscellaneous, incidental low-cost components that are essential for, but incidental to, the construction and are incorporated into the physical structure of the project. Examples of De Minimis components could include small washers, screws, fasteners (such as “off the shelf” nuts and bolts), miscellaneous wire, corner bead, ancillary tube, signage, trash bins, door hardware etc. Costs for such De Minimis components cumulatively may comprise no more than a total of five percent of the total cost of the materials used in and incorporated into a project; the cost of an individual item may not exceed one percent of the total cost of the materials used in and incorporated into a project.
- F. Electrical Equipment - Typically any machine powered by electricity and includes components that are part of the electrical distribution system. AIS does not apply to Electrical Equipment.
- G. Engineer’s Certification - Documentation submitted by the Engineer that Drawings, Specifications, and Bidding Documents comply with AIS.
- H. Iron and Steel products - The following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials. Only items on the above list made primarily of iron or steel, permanently incorporated into the project must be Produced in the United States. For example, trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. iron or steel.
- I. Manufacturer - A Supplier, fabricator, distributor, materialman, or vendor is an entity with which the Buyer, Seller or any subSeller has contracted to furnish materials or equipment to be incorporated in the project by the Buyer, Seller, or a subSeller.
- J. Manufacturer’s Certification - Documentation provided by the Manufacturer stating that the Iron and Steel products to be used in the project are produced in the United States in accordance with American Iron and Steel (AIS) Requirements. If items are purchased via a Supplier, distributor, vendor, etc. from the Manufacturer directly, then the Supplier,

distributor, vendor, etc. will be responsible for obtaining and providing these certifications to the parties purchasing the products.

- K. **Manufacturing Processes** - Processes such as melting, refining, pouring, forming, rolling, drawing, finishing, and fabricating. Further, if a domestic Iron and Steel product is taken out of the United States for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a Coating are similarly not covered. Non-iron or Steel components of an Iron and Steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-Iron and Steel components do not have to be of domestic origin. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-U.S. sources.
- L. **Mechanical Equipment** - Typically equipment which has motorized parts and/or is powered by a motor. AIS does not apply to Mechanical Equipment.
- M. **Minor Components** - Components within an iron and/or Steel product otherwise compliant with the American Iron and Steel requirements; this waiver is typically used by Manufacturers. It differs from the De Minimis definition in that De Minimis pertains to the entire project and the minor component definition pertains to a single product. This waiver allows use of non-domestically produced miscellaneous Minor Components comprising up to five percent of the total material cost of an otherwise domestically produced Iron and Steel product. However, unless a separate waiver for a product has been approved, all other Iron and Steel components in said product must still meet the AIS requirements. This waiver does not exempt the whole product from the AIS requirements only Minor Components within said product and the iron or Steel components of the product must be produced domestically. Valves and hydrants are also subject to the cost ceiling requirements described here. Examples of Minor Components could include items such as pins and springs in valves/hydrants, bands/straps in couplings, and other low-cost items such as small fasteners etc.
- N. **Municipal Castings** - Cast iron or Steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and solid waste infrastructure.
- O. **Primarily Iron or Steel** - A product is made of greater than 50 percent iron or Steel on a materials cost basis. An exception to this definition is reinforced precast concrete (see Definitions). All technical specifications and applicable industry standards (e.g. NIST, NSF, AWWA) must be met. If a product is determined to be less than 50 percent iron and/or steel, the AIS requirements do not apply. For example, the cost of a fire hydrant includes:
 - 1. The cost of materials used for the iron portion of a fire hydrant (e.g. bonnet, body and shoe); and
 - 2. The cost to pour and cast to create those components (e.g. labor and energy).
 - 3. Not included in the cost are:
 - a. The additional material costs for the non-iron or Steel internal workings of the hydrant (e.g. stem, coupling, valve, seals, etc.); and
 - b. The cost to assemble the internal workings into the hydrant body.

- P. Produced in the United States - The production in the United States of the iron or Steel products used in the project requires that all Manufacturing Processes must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives.
- Q. Reinforced Precast Concrete – Reinforced Precast Concrete structures must comply with AIS, regardless of whether or not it consists of at least 50 percent iron or steel. The reinforcing bar and wire must be Produced in the United States and meet the same standards as for any other iron or Steel product. Additionally, the casting of the concrete product must take place in the United States. The cement and other raw materials used in concrete production are not required to be of domestic origin. If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered Construction Materials and must be Produced in the United States.
- R. Steel - An alloy that includes at least 50 percent iron, between 0.02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of Steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of Steel covers carbon steel, alloy steel, stainless steel, tool steel, and other specialty steels.
- S. Structural Steel - Rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees, and zees. Other shapes include but are not limited to, H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Seller delivers the executed counterparts of the Procurement Agreement to Buyer, the Seller also shall deliver to Buyer the performance bond and payment bond (if the Procurement Task Order requires Seller to furnish such bonds).
- B. *Evidence of Seller's Insurance:* When Seller delivers the signed counterparts of the Procurement Agreement to Buyer, the Seller also shall deliver to Buyer, with copies to each additional insured (as identified in the Procurement Task Order), the certificates, endorsements, and other evidence of insurance required to be provided by Seller in accordance with Article 5. Evidence of insurance to be obtained at a later date, such as insurance relating to transit or storage of the Goods, will be provided to Buyer at the time of such insurance is obtained.
- C. *Evidence of Buyer's Insurance:* After receipt of the signed counterparts of the Procurement Agreement and all required bonds and insurance documentation, Buyer shall promptly deliver to Seller, with copies to each additional insured (as identified in the Procurement Task Order), certificates and other evidence of insurance (if any) required to be provided by Buyer.

2.02 *Copies of Documents*

- A. Buyer shall furnish to Seller three printed copies of the Procurement Task Order (including one fully executed counterpart of the Procurement Agreement), and one copy in electronic

portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

2.03 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Procurement Task Order, the Buyer, Seller, and Engineer may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Procurement Task Order does not establish protocols for Electronic Means, then Buyer, Seller, and Engineer shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

2.04 *Preliminary Schedules*

- A. Within 15 days after the Effective Date of the Procurement Task Order, Seller shall submit to Buyer and Engineer for timely review:
 - 1. a progress schedule of activities, consistent with the Procurement Task Order Times, including at a minimum, Shop Drawing and Sample submittals, tests, and deliveries as required by the Procurement Task Order Documents.
 - a. 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 of the Procurement Task Order Times.
 - b. Such acceptance will not impose on Buyer or Engineer responsibility for the progress schedule, for sequencing, scheduling, or progress of Seller's performance of its obligations under the Procurement Task Order, nor interfere with or relieve Seller from Seller's full responsibility therefor.
 - c. Such acceptance will not be deemed as an acknowledgment of the reasonableness and attainability of the schedule.
 - 2. a preliminary schedule of Submittals.
- B. No progress payment will be made to Seller until an acceptable progress schedule and acceptable schedule of Submittals are submitted to Buyer and Engineer (and other conditions applicable to progress payments are met).

2.05 *Preliminary Conference*

- A. Within 20 days after the Procurement Task Order 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 schedules referred to in Paragraph 2.04.A, procedures for handling Shop Drawings and other Submittals, processing Applications for Payment, and maintaining required records.

2.06 *Safety*

- A. Buyer and Seller shall comply with all applicable Laws and Regulations relating to the safety of persons or property, and to the protection of persons or property from damage, injury, or loss.

- B. 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.
- C. If Buyer or its representatives visit the Seller's manufacturing or storage facilities, for testing, inspection, or other purposes, Seller shall inform Buyer in advance of any safety preparations, standards, or programs with which Buyer and its representatives must comply.

ARTICLE 3—PROCUREMENT TASK ORDER DOCUMENTS

3.01 *Intent*

- A. The Procurement Task Order 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 Procurement Task Order 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. Unless otherwise stated in the Procurement Task Order Documents, if there is a discrepancy between the electronic or digital versions of the Procurement Task Order Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version will govern.
- D. The Procurement Task Order supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Procurement Task Order Documents, as provided in Paragraph 3.04.
- F. Any provision or part of the Procurement Task Order Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Buyer and Seller.

3.02 *Reference Standards*

- 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, means 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 Procurement Agreement if there were no Bids), except as may be otherwise specifically stated in the Procurement Task Order Documents.
- B. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a supplier, will be effective to change the duties or responsibilities of Buyer, Seller, or Engineer from those set forth in the part of the Procurement Task Order Documents prepared by or for Engineer. No such provision or instruction will be effective to assign to Buyer or Engineer 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 part of the Procurement Task Order Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Seller's Review of Procurement Task Order Documents:* If, before or during the performance of Seller's obligations, Seller discovers any conflict, error, ambiguity, or discrepancy within the Procurement Task Order Documents, or between the Procurement Task Order Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any supplier to Seller, then Seller shall promptly report it to Engineer in writing. Seller shall not proceed with the Goods and Special Services affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer or by an amendment or supplement to the Procurement Task Order Documents issued pursuant to Article 11.
2. Seller shall not be liable to Buyer or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Procurement Task Order Documents unless Seller had actual knowledge thereof.

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

1. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Procurement Task Order 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 Procurement Task Order Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Procurement Drawings and Procurement Specifications*

- A. During the performance of Seller's obligations and until final payment, Seller and Buyer shall submit to the Engineer all matters in question concerning the requirements of the Procurement Drawings and Procurement Specifications (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Goods and Special Services, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Procurement Drawings and Procurement Specifications, and judge of the acceptability of the Goods and Special Services thereunder.
- B. Engineer will issue with reasonable promptness a written clarification, interpretation, or decision on the issue submitted, and if necessary, initiate an amendment or supplement to the Procurement Drawings or Procurement Specifications. Engineer's written clarification, interpretation, or decision will be consistent with the overall intent of the Procurement Task Order Documents, and will be final and binding on Seller and Buyer. If either Buyer or Seller believes that a written clarification or interpretation justifies an adjustment in the Procurement Task Order Price or Procurement Task Order Times, either may make a Claim for such adjustment as provided in Article 12.
- C. If a submitted matter in question concerns terms and conditions of the Procurement Task Order Documents that do not involve (1) the performance or acceptability of the Goods and

Services, (2) the design (as set forth in the Procurement Drawings, Procurement Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Buyer and Seller that Engineer is unable to provide a decision or interpretation.

3.05 *Reuse of Documents*

- A. Seller and its subcontractors and suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Procurement Drawings, Procurement Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Procurement Drawings, Procurement Specifications, other documents, or copies thereof, on extensions of the Project or any other project, without written consent of Buyer and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Procurement Task Order Documents, reuse any such Procurement Task Order Documents for any purpose without Buyer's express written consent, or violate any copyrights pertaining to such Procurement Task Order Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Procurement Task Order. Nothing herein precludes Seller from retaining copies of the Procurement Task Order Documents for record purposes.

3.06 *American Iron and Steel (AIS) Requirements*

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

paragraph force or effect) shall be amended or waived without the prior written consent of the State.

ARTICLE 4—COMMENCEMENT AND SCHEDULE

4.01 *Commencement of Procurement Task Order Times*

- A. The Procurement Task Order Times will commence to run on the Effective Date of the Procurement Task Order.

4.02 *Continuing Performance*

- A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.04.A., as duly adjusted, and the Goods will be delivered and the Special Services furnished within the Procurement Task Order Times.
- 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 will be delayed or postponed pending resolution of any disputes or disagreements, except as expressly permitted herein, or as Buyer and Seller may otherwise agree in writing.

4.03 *Adjustments to Progress Schedule*

- A. The progress schedule established in accordance with Paragraph 2.04 may be adjusted from time to time as provided below.
 - 1. Seller shall submit to Buyer for acceptance (to the extent indicated in Paragraph 2.04) proposed adjustments in the progress schedule that will not result in changing the Procurement Task Order Times. Such adjustments will comply with any applicable provisions of the Procurement Specifications.
 - 2. Proposed adjustments in the progress schedule that will change the Procurement Task Order Times must be submitted in accordance with the requirements of Article 11. Adjustments in Procurement Task Order Times may only be made by a Change Order.

4.04 *Delays*

- A. If Buyer, Engineer, or anyone for whom Buyer is responsible, delays, disrupts, or interferes with Seller's performance or progress, then Seller shall be entitled to an equitable adjustment in Procurement Task Order Price or Procurement Task Order Times.
- B. Seller shall not be entitled to an adjustment in Procurement Task Order Price or Procurement Task Order Times for delay, disruption, or interference caused by or within the control of Seller or anyone for whom Seller is responsible.
- C. If Seller's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Buyer, Seller, and those for which they are responsible, then Seller shall be entitled to an equitable adjustment in Procurement Task Order Times. Such an adjustment will be Seller's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Procurement Task Order Times under this paragraph include but are not limited to the following:
 - 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;
3. inspection delays by governmental authorities, and custom delays;
4. international shipping delays;
5. acts or failures to act of third-party entities; and
6. acts of war or terrorism.
7. Weather-Related Delays
 - a. If “abnormal weather conditions” as set forth in Paragraph 4.04.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Task Order Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.
 - b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
 - 1) Every workday on which one or more of the following conditions exist will be considered a “bad weather day”:
 - i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds **1.0** inches of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference.
 - ii) Ambient outdoor air temperature for 60 minutes between the hours of 10:00 a.m. and 3:00 p.m. is equal to or less than the following low temperature threshold: **15** degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: **100** degrees Fahrenheit.
 - 2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by the City of Sweet Home Public Works Department.
 - 3) Seller shall anticipate the number of foreseeable bad weather days per month indicated in the table below —Foreseeable Bad Weather Days.
 - 4) Seller shall include the following Foreseeable Bad Weather Days in the Progress Schedule as follows:
 - i) January – 3 Days
 - ii) February – 2 Days
 - iii) March – 1 Day
 - iv) April – 1 Days
 - v) May – 0 Days

- vi) June – 0 Days
- vii) July – 1 Days
- viii) August – 2 Days
- iv) September – 1 Days
- v) October – 1 Day
- vi) November – 2 Days
- vii) December – 3 Days

- 5) In each month, every bad weather day exceeding the number of Foreseeable Bad Weather Days will be considered as “abnormal weather conditions.” The existence of abnormal weather conditions will not relieve Seller of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Seller’s then-current Progress Schedule’s critical path for the Project.
- 6) If mutually agreed upon by Buyer and Seller, working hours during days with anticipated abnormal weather periods can be adjusted to allow work earlier or later in the day depending on the type of abnormal weather expected.

D. *Adjustments of Procurement Task Order Times or Procurement Task Order Price—General Provisions:* Seller’s entitlement to an adjustment of Procurement Task Order Times or Procurement Task Order Price is limited as follows:

- 1. Seller’s entitlement to an adjustment of the Procurement Task Order Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of Seller’s obligations, as of the time of the delay, disruption, or interference.
- 2. Seller shall not be entitled to an adjustment in Procurement Task Order Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Seller. Such a concurrent delay by Seller does not preclude an adjustment of Procurement Task Order Times to which Seller is otherwise entitled.
- 3. Adjustments of Procurement Task Order Times or Procurement Task Order Price are subject to the provisions of Articles 11 and 12.

E. Each Seller request seeking a delay-related increase in Procurement Task Order Times or Procurement Task Order Price must be supplemented by supporting data that sets forth in detail the following: (1) the circumstances that form the basis for the requested adjustment; (2) the date upon which each cause of delay, disruption, or interference began to affect Seller’s progress; (3) the date upon which each cause of delay, disruption, or interference ceased to affect Seller’s progress; (4) the number of days’ increase in Procurement Task Order Times claimed as a consequence of each such cause of delay, disruption, or interference; and (5) the impact on Procurement Task Order Price. Seller shall also furnish such additional supporting documentation as Buyer or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion.

ARTICLE 5—BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Seller shall furnish a performance bond and a payment bond, each in an amount at least equal to the Procurement Task Order Price, as security for the faithful performance and payment of Seller's obligations under the Procurement Task Order. These bonds must remain in effect until three years after the date when final payment becomes due or until completion of the correction period specified in Paragraph 9.04, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Procurement Task Order.
 - 1. *Required Performance Bond Form:* The performance bond that Seller furnishes will be in the form of EJCDC® P-610, Performance Bond (2010 or 2019 edition).
 - 2. *Required Payment Bond Form:* The payment bond that Seller furnishes will be in the form of EJCDC® P-615, Payment Bond (2010 or 2019 edition).
- B. Seller shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Procurement Task Order.
- C. All bonds must be in the form specified by Buyer prior to execution of the Procurement Task Order, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- D. Seller shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Seller is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then 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 bond and surety requirements of this Procurement Task Order.
- F. If Seller has failed to obtain a required bond, Buyer may exercise Buyer's termination rights under Article 14.
- G. Upon request to Buyer from any subcontractor, supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of Seller's obligations, Buyer shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Seller from any subcontractor, supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of Seller's obligations, Seller shall provide a copy of the payment bond to such person or entity.

5.02 Insurance—General Provisions

- A. Buyer and Seller shall obtain and maintain insurance as required in this procurement Task Order and City of Sweet Home Special Provisions.
- B. Seller's insurance required by the Task Order shall be primary over Buyer's insurance and shall include a waiver of subrogation against Buyer and Engineer.
- C. All insurance required by the Task Order to be purchased and maintained by Buyer or Seller shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. All companies that provide insurance policies required under this Task Order shall have an A.M. Best rating of A-VII or better.
- D. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Task Order.
- E. Seller shall deliver to Buyer, with copies to each additional insured identified in the Task Order, certificates of insurance and endorsements establishing that Seller has obtained and is maintaining the policies and coverages required by the Task Order. Upon request by Buyer or any other insured, Seller shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Seller, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Task Order.
- F. Buyer shall deliver to Seller, with copies to each additional insured identified in the Task Order, certificates of insurance and endorsements establishing that Buyer has obtained and is maintaining the policies and coverages required of Buyer by the Task Order (if any). Upon request by Seller or any other insured, Buyer shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Buyer may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Task Order.
- G. Failure of Buyer or Seller to demand such certificates or other evidence of the Seller's full compliance with these insurance requirements, or failure of Buyer or Seller to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the Seller's obligation to obtain and maintain such insurance.
- H. In addition to the liability insurance required to be provided by Seller, the Buyer, at Buyer's option, may purchase and maintain Buyer's own liability insurance. Buyer's liability policies, if any, operate separately and independently from policies required to be provided by Seller, and Seller cannot rely upon Buyer's liability policies for any of Seller's obligations to the Buyer, Engineer, or third parties.

- I. Seller shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Buyer and Engineer (and any other individuals or entities identified in the General Conditions as additional insureds on Seller's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- J. If either party does not purchase or maintain the insurance required of such party by the Task Order, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- K. If Seller has failed to obtain and maintain required insurance, Seller's entitlement to enter or remain at the Site will end immediately, and Buyer may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Buyer's termination rights under Article 14.
- L. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Task Order Price will be adjusted accordingly.
- M. Buyer does not represent that insurance coverage and limits established in this Task Order necessarily will be adequate to protect Seller or Seller's interests. Seller is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Seller deems necessary.
- N. The insurance and insurance limits required herein will not be deemed as a limitation on Seller's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Buyer and other individuals and entities in the Task Order or otherwise.
- O. All the policies of insurance required to be purchased and maintained under this Task Order will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each additional insured.

6.03 Seller's Insurance

- A. *Required Insurance:* Seller shall purchase and maintain Worker's Compensation, Commercial General Liability, Builders Risk and other insurance pursuant to the specific requirements set forth herein.
- B. *General Provisions:* The policies of insurance required by this Paragraph 5.03 must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Article 13), and longer if expressly required elsewhere in this Task Order, and at all times thereafter when Seller may be correcting, removing, or replacing defective Work as a warranty or correction

- obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Task Order;
4. apply with respect to the performance of the Work, whether such performance is by Seller, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds*: The Seller’s commercial general liability, automobile liability, employer’s liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Task Order, must:
1. include and list as additional insureds the following:
 - a. BUYER: “City of Sweet Home, its officers, employees, agents, and consultants”; AND
 - b. ENGINEER: “West Yost Associates Inc., its officers, employees, agents, and consultants”; AND
 - c. any individuals or entities identified as additional insureds herein.
 2. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);
 3. not seek contribution from insurance maintained by the additional insured; and
 4. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Seller’s acts or omissions, or the acts and omissions of those working on Seller’s behalf, in the performance of Seller’s operations.
- D. *Other Additional Insureds*: As a supplement to the provisions of Paragraph 5.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds the Buyer and Engineer.
- E. *Workers’ Compensation and Employer’s Liability Insurance*: Seller shall purchase and maintain Worker’s Compensation and Employer’s Liability Insurance. This insurance shall protect SELLER against all claims under applicable state workers’ compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen’s and Harbor Workers’ Act and the Jones Act. SELLER shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers’ compensation law. This policy shall include an “all states” or “other states” and waiver of subrogation endorsements. The liability limits, as required by state law shall be not less than:
1. Workers’ Compensation: Statutory
 2. Employer’s Liability: \$1,000,000 each occurrence
- F. *Commercial General Liability—Claims Covered*: Seller shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Seller, on an occurrence basis, against claims for:
1. damages because of bodily injury, sickness or disease, or death of any person other than Seller’s employees,

2. damages insured by reasonably available personal injury liability coverage, and
 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- G. *Commercial General Liability—Form and Content:* Seller’s commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
 - a. Such insurance must be maintained for three years after final payment.
 - b. Seller shall furnish Buyer and each other additional insured (as identified in the General Conditions or elsewhere in the Task Order) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, including but not limited to coverage of Seller’s contractual indemnity obligations in Paragraph 7.107.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.
 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Seller demonstrates to Buyer that the specified ISO endorsements are not commercially available, then Seller may satisfy this requirement by providing equivalent endorsements.
 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 “Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured” or its equivalent.
- H. *Commercial General Liability Insurance Coverage:* This insurance shall be occurrence type written in comprehensive form and shall protect SELLER, BUYER, and ENGINEER as additional insureds, against claims arising out of performance of the Work. The policy shall also include personal injury liability coverage, contractual liability coverage, completed operations and products liability coverage, and coverage for blasting, explosion, collapse of buildings, and damage to underground property. The liability limits for bodily injury and property damage shall be not less than:
1. Combined Single Limit for each occurrence: \$2,000,000
 2. General aggregate: \$2,000,000
- I. *Automobile Liability:* Seller shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	\$1,000,000
Each Accident	\$1,000,000

Automobile Liability	Policy limits of not less than:
Property Damage	
Each Accident	\$1,000,000
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$2,000,000

J. **Umbrella Liability Insurance:** Seller shall purchase and maintain umbrella liability insurance. This insurance shall protect SELLER, BUYER, and ENGINEER as additional insureds, against claims in excess of the limits provided under workers' compensation and employer's liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits. The liability limits for bodily injury and property damage shall be not less than:

1. Combined Single Limit for each occurrence: \$5,000,000
2. General aggregate: \$5,000,000

K. **Pollution Liability Insurance:** If not otherwise included in the Seller's Commercial General Liability Insurance coverage, Seller shall purchase and maintain pollution liability insurance for claims arising from the discharge, dispersal, release, escape of any irritant or contaminant into or upon land, any structure, the atmosphere, watercourse, or body of water including groundwater. This shall include coverage for claims of: (a) clean up, either on-site or off site; (b) third party liability, including bodily injury, property damage, natural resource damage, third party property loss of use/revenue, and clean up; and/or (c) costs incurred for regulatory fines and/or the investigation, defense, or settlement of claims. The liability limits for pollution shall not be less than:

1. Combined Single Limit for each occurrence: \$5,000,000
2. General aggregate: \$5,000,000

L. **Railroad Protective Liability Insurance:** Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Seller shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Buyer, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Buyer of such submittal.

Railroad Protective Liability Insurance	Policy limits of not less than:
Each Claim	\$ 1,000,000
Aggregate	\$ 2,000,000

M. **Unmanned Aerial Vehicle Liability Insurance:** If Seller uses unmanned aerial vehicles (UAV—commonly referred to as drones) at the Site or in support of any aspect of the Work, Seller shall obtain UAV liability insurance in the amounts stated; name Buyer, Engineer, and all individuals and entities identified in the General Conditions as additional insureds; and provide a certificate to Buyer confirming Seller's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

Unmanned Aerial Vehicle Liability Insurance	Policy limits of not less than:
Each Claim	\$ 100,000
General Aggregate	\$ 250,000

6.04 Builder's Risk and Other Property Insurance

- A. *Builder's Risk*: Seller shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the General Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the General Conditions.
- B. *Property Insurance for Facilities of Buyer Where Work Will Occur*: Buyer is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Article 13.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Buyer will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Article 13. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Buyer's procurement of such property insurance.
- D. *Partial Occupancy or Use by Buyer*: If Buyer will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, , then Buyer (directly, if it is the purchaser of the builder's risk policy, or through Seller) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Task Order do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Seller elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Seller's expense.
- F. *Builder's Risk Requirements*: The builder's risk insurance must:
 - 1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

- a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.
 - b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Buyer and Seller.
2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Buyer-furnished or assigned property; (b) spare parts inventory required within the scope of the Task Order; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of Sellers, engineers, and architects).
4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of \$2,000,000.
5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of \$2,000,000.
6. allow for the waiver of the insurer's subrogation rights, as set forth in this Task Order.
7. allow for partial occupancy or use by Buyer by endorsement, and without cancellation or lapse of coverage.
8. include performance/hot testing and start-up, if applicable.
9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Buyer's procurement of property insurance following Substantial Completion, whichever occurs first.
- 10 include as named insureds the Buyer, Seller, Subcontractors (of every tier), and any other individuals or entities required by this Task Order to be insured under such builder's risk policy. Parties required to be insured will be referred to collectively as "insureds." In addition to Buyer, Seller, and Subcontractors of every tier, include as insureds the following:
 - a. West Yost Associates, Inc.
Charles Duncan, President
2020 Research Park Drive, Suite 100
Davis, CA 95618
503.756.5905; CDuncan@westyost.com

11. include, in addition to the Task Order Price amount, the value of the following equipment and materials to be installed by the Seller but furnished by the Buyer or third parties:
 - a. Electrical motor control centers, control panels and other equipment to be supplied by Buyer's Integrator-of-Record, such sublimit will be a minimum of \$3,000,000.
12. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of \$5,000,000.

6.05 Property Losses; Subrogation

- A. The builder's risk insurance policy purchased and maintained, at Contactor's expense, in accordance with Paragraph 5.04 (or an installation floater policy if authorized), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.
 1. Buyer and Seller waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the General Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Buyer or Seller as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Buyer covering any loss, damage, or consequential loss to Buyer's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Buyer; or to part or all of the completed or substantially completed Work, during partial occupancy or use, after Substantial Completion, or after final payment pursuant to Paragraph 13.05, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Seller, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written Task Order executed prior to the loss, damage, or consequential loss.
 1. Buyer waives all rights against Seller, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 5.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Buyer's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

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

6.06 Receipt and Application of Property Insurance Proceeds

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 5.04 will be adjusted and settled with the Seller and Buyer. Seller and Buyer shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer to the Seller and Buyer as the fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. Seller and Buyer receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Task Order or applicable Laws and Regulations.
- C. If no other special agreement is reached, Seller shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 6—LICENSES AND FEES

6.01 *Intellectual Property and License Fees*

- A. Except to the extent stated elsewhere in the Procurement Task Order Documents, Seller is not transferring any patent rights, copyrights, or other intellectual property rights for the Goods delivered.
- B. To the extent Seller is manufacturing to Buyer's design, Buyer retains all patent rights, copyrights, and other intellectual property rights in such design.
- C. If an invention, design, process, product, or device is specified in the Procurement Task Order Documents for incorporation in the Goods or for the performance of Special Services, and if, to the actual knowledge of Buyer or Engineer, its use is subject to patent rights, copyrights, or other intellectual property rights calling for the payment of a license fee or royalty to others, then the existence of such rights and payment obligations will be disclosed to Seller in the Procurement Task Order Documents.
- D. 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 Procurement Task Order Documents.

6.02 *Seller's Infringement*

- A. Subject to Paragraph 6.01, to the fullest extent permitted by Laws and Regulations, 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 patent, copyright, or other intellectual property right by any of the Goods as delivered or Special Services as performed.

- B. Buyer will promptly notify Seller in writing of any claim, suit, or threat of suit by a third party for any infringement or alleged infringement of any patent, copyright, or other intellectual property right with respect to the Goods as delivered or Special Services as performed.
- C. Seller shall promptly defend or settle the claim or suit. Seller shall have control over such claim or suit, bear all expenses, and satisfy any adverse judgment.
 - 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, 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 the intellectual property rights of another, Seller may, at Seller's own expense, obtain the necessary licenses for Buyer's benefit, or replace the Goods and provide related design and construction, consistent with the requirements of the Procurement Task Order Documents, to avoid the infringement.

6.03 *Buyer's Infringement*

- A. Subject to Paragraph 6.01, and to the fullest extent permitted by Laws and Regulations, Buyer shall be responsible to Seller for any infringement or alleged infringement of any patent, copyright, or other intellectual property right caused by Seller's compliance with the Procurement Drawings or Procurement Specifications, and will reimburse Seller for any license fee or royalties paid by Seller to others if such payment resulted from any invention, design, process, product, or device specified to be furnished or performed in the Procurement Drawings or Procurement Specifications, but not identified as being subject to payment of such license fee or royalty.
- B. Seller will promptly notify Buyer in writing of any claim, suit, or threat of suit by a third party for intellectual property infringement arising from Seller's compliance with the Procurement Drawings or Procurement Specifications.
- C. Buyer shall defend or settle the claim or suit. Buyer shall have control over such claim or suit, bear all expenses, and satisfy any adverse judgment.
 - 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, Seller shall be barred from any remedy against Buyer for such suit or claim.

ARTICLE 7—SELLER’S RESPONSIBILITIES

7.01 *Performance of Obligations*

- A. Seller shall be solely responsible for the means, methods, techniques, sequences, and procedures necessary to perform its obligations in accordance with the Procurement Task Order Documents.
- B. 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 Procurement Task Order Documents.
- C. Seller shall coordinate the provision of Special Services to avoid or limit interference or disruption of other activities at the location where the Special Services are to occur, including but not limited to ongoing facility operations and construction activities.

7.02 *Labor, Materials and Equipment*

- A. Seller shall provide competent, qualified and trained personnel in all aspects of its performance of the Procurement Task Order.
- B. All Goods, and all equipment and material incorporated into the Goods, must be as specified, and unless specified otherwise in the Procurement Task Order Documents, must 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.

7.03 *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 Procurement Task Order 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 will not be Seller’s responsibility to make certain that the Procurement Specifications and Procurement Drawings are in accordance with Laws and Regulations, but this provision will 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 Procurement Task Order if there were no Bids) that have a direct effect on the cost or time of Seller’s performance will be the subject of an adjustment in Procurement Task Order Price or Procurement Task Order 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 Article 12.

- D. Seller shall comply with all applicable state and federal regulations as required by the Oregon Infrastructure Finance Authority of the Business Development Department and Oregon Health Authority, including, but not limited to:
1. Design and fabrication shall comply with application sections of ORS Chapter 333 Division 61 for Drinking Water, establishing design and construction standards for drinking water systems in Oregon.
 2. State procurement regulations found in the Oregon Public Contracting Code, ORS chapters 279A, 279B and 279C.
 3. State labor standards and wage rates found in ORS 279C.
 4. Manufacturer's certification of compliance with the American Iron and Steel (AIS) requirements of Section 746, Division A, Title VII of the Consolidated Appropriations Act of 2017.
 - a. "Iron and steel products" are defined as the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.
 - b. Only items on the above list made primarily of iron or steel, permanently incorporated into the project must be produced in the United States. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.
 - c. "Minor components" are components within an iron and/or steel product otherwise compliant with the American Iron and Steel requirements. This is different from the de minimis definition where de minimis pertains to the entire project and the minor component definition pertains to a single product. This waiver, would allow non-domestically produced miscellaneous minor components comprising up to five percent of the total material cost of an otherwise domestically produced iron and steel product to be used. This waiver does not exempt the whole product from the AIS requirements only minor components within said product and the iron or steel components of the product must be produced domestically.

7.04 "Or Equals"

- A. Whenever an item of material or equipment to be incorporated into the Goods is specified or described in the Procurement Task Order Documents by using the names of one or more proprietary items or specific suppliers or manufacturers, 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 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 (4) Seller certifies that if approved: a) there will be no increase in any cost, including capital, installation or operating costs, to Buyer; and b) the proposed item will conform substantially to the detailed requirements of the item named in the Procurement Task Order Documents.
- B. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or Submittal made pursuant to Paragraph 7.04.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 Procurement Task Order 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.

7.05 Taxes

- A. Seller shall pay all taxes and duties arising out of the sale of the Goods and the performance of Special Services. All taxes and duties are included in the Procurement Task Order Price, except as noted in the General Conditions.

7.06 Submittals

A. Shop Drawing and Sample Requirements

1. Before submitting a Shop Drawing or Sample, Seller shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Procurement Task Order Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal; and
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of Seller's obligations.
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Seller has satisfied its obligations under the Procurement Task Order Documents with respect to Seller's review of that Submittal, and that Seller approves the Submittal.
 3. With each Shop Drawing or Sample, Seller shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Procurement Task Order Documents. This notice will be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Seller shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Seller shall submit the number of copies required in the Procurement Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Seller proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.06.C.
 2. *Samples*
 - a. Seller shall submit the number of Samples required in the Procurement Specifications.
 - b. Seller shall clearly identify each Sample as to material, supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.06.C.
 3. Where a Shop Drawing or Sample is required by the Procurement Task Order Documents or the Schedule of Submittals, any related work performed by Seller prior to Engineer's review and approval of the pertinent Submittal will be at the sole expense and responsibility of Seller.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's favorable review will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Goods, comply with the requirements of the Procurement Task Order Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Procurement Task Order Documents.
 2. Engineer's favorable review will not extend to means, methods, techniques, sequences, or procedures of construction, manufacturing, fabrication, installation, or shipping, or to safety precautions or programs incident thereto.
 3. Engineer's favorable review of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's favorable review of a Shop Drawing or Sample will not relieve Seller from responsibility for any variation from the requirements of the Procurement Task Order Documents unless Seller has complied with the requirements of Paragraph 7.06.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Procurement Task Order Documents in a Field Order or other appropriate Procurement Task Order modification.
5. Engineer's favorable review of a Shop Drawing or Sample will not relieve Seller from responsibility for complying with the requirements of Paragraphs 7.06.A and B.
6. Engineer's favorable review of a Shop Drawing or Sample, or of a variation from the requirements of the Procurement Task Order Documents, will not, under any circumstances, change the Procurement Task Order Times or Procurement Task Order Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, acceptance or favorable review of a Shop Drawing or Sample will result in such item becoming a Procurement Task Order Document.
8. Seller shall furnish Goods that comply with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.06.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

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 revisions other than the corrections called for by Engineer on previous Submittals.
2. Seller shall furnish required Shop Drawing and Sample Submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Seller shall be responsible for Engineer's charges to Buyer for such time. Buyer may impose a set-off against payments due Seller to secure reimbursement for such charges.
3. If Seller requests a change of a previously favorably reviewed Shop Drawing or Sample, Seller shall be responsible for Engineer's charges to Buyer for its review time, and Buyer may impose a set-off against payments due Seller to secure reimbursement for such charges, unless the need for such change is beyond the control of Seller.

E. Submittals Other than Shop Drawings and Samples

1. The following provisions apply to all Submittals other than Shop Drawings and Samples:
 - a. Seller shall submit all such Submittals to the Engineer in accordance with the schedule of Submittals and pursuant to the applicable terms of the Procurement Task Order Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the schedule of Submittals and return such Submittals with a notation of either

Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the schedule of Submittals will be deemed accepted.

- c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Procurement Task Order Documents as to general form and content of the Submittal.
 - d. If any such Submittal is not accepted, Seller shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.04 and 2.05.

7.07 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, Seller shall indemnify and hold harmless Buyer, Engineer, Operations Contractor, Project Owner, and any assignee of Buyer, and their officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of Seller's obligations under the Procurement Task Order, provided that any such claim, cost, loss, or damage is 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, Engineer, Project Owner, or any assignee of Buyer, including Contractor/Assignee, or their 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 7.07.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Seller or any such subcontractor, supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.08 Concerning Subcontractors and Suppliers

- A. Seller may retain subcontractors and suppliers for the performance of parts of the furnishing of the Goods and Special Services. The Seller's retention of a subcontractor or supplier will not relieve Seller's obligation to Buyer to perform and complete the furnishing the Goods and Special Services in accordance with the Procurement Task Order Documents.

ARTICLE 8—SHIPPING AND DELIVERY

8.01 Shipping

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

8.02 *Delivery*

- A. Seller shall deliver the Goods free on board (FOB) to the Point of Destination, freight prepaid, in accordance with the Procurement Task Order Times set forth in the Procurement Agreement, or other date agreed to by Buyer and Seller.
- B. At least 10 days before shipment, Seller shall provide written notice to Buyer of the manner of shipment and the anticipated delivery date. The notice must 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 at the time established for delivery, or on another date agreed to by Buyer and Seller.
- E. No partial deliveries will be allowed, unless permitted or required by the Procurement Task Order Documents or agreed to in writing by Buyer.
- F. Provisions governing inspection on delivery are set forth in Paragraph 9.02.

8.03 *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 8.03.A, if Buyer rejects the Goods as non-conforming, the risk of loss on such Goods will 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.

ARTICLE 9—BUYER'S RIGHTS

9.01 *Seller's Warranties and Guarantees*

- A. Seller warrants and guarantees to Buyer that the title to the Goods conveyed will 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 Procurement Task Order 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 Procurement Task Order Documents do not otherwise specify the characteristics or the quality of the Goods, the Goods must comply with the requirements of Paragraph 7.02.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;
 - 2. excessive corrosion or chemical attack, unless corrosive or chemically-damaging conditions were disclosed by Buyer in the Procurement Task Order Documents and the Procurement Task Order 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 Procurement Task Order Documents will 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 Procurement Task Order Documents:
1. observations by Buyer, Engineer, or Project Owner;
 2. recommendation by Engineer or payment by Buyer of any progress or final payment;
 3. use of the Goods by Buyer or Project Owner;
 4. any acceptance by Buyer, Engineer, or Project Owner, or any failure to do so;
 5. the end of the correction period established in Paragraph 9.04;
 6. the issuance of a notice of acceptance;
 7. any inspection, test or approval by others; or
 8. any correction of non-conforming Goods and Special Services by Buyer or Project Owner.
- E. Buyer shall promptly notify Seller of any breach of Seller's warranties or guarantees.

9.02 *Inspections and Testing*

A. *General Provisions*

1. The Procurement Task Order 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 Procurement Task Order 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 Procurement Task Order Documents (other than any re-inspection or retesting resulting from a determination of non-conformity, as set forth in Paragraph 9.03); 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 Procurement Task Order 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, and a representative of Seller will attend such tests, inspections, and approvals.
6. If, on the basis of inspections or testing, the Goods appear to be conforming, Buyer will give Seller prompt notice thereof. If on the basis of 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 9.03.
7. Neither payments made by Buyer to Seller prior to any tests or inspections, nor any tests or inspections, will constitute acceptance of non-conforming Goods, or prejudice Buyer's rights under the Procurement Task Order.

B. *Visual Inspection on Delivery*

1. Buyer will visually inspect the Goods upon delivery solely for purposes of identifying the Goods, general verification of quantities, and observation of apparent condition. 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. If, on the basis of the visual inspection specified in Paragraph 9.02.B.1, the Goods appear to comply with the requirements of the Procurement Task Order Documents as to quantities and condition, then within 10 days of delivery Buyer shall issue to Seller Buyer's acknowledgment of the receipt of 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 required, and Seller has performed and completed all Special Services, Buyer will make a final inspection.
2. If, on the basis of the final inspection, Buyer determines that the Goods and Special Services are conforming, Buyer's notice thereof will constitute Buyer's acceptance of the Goods and Special Services, subject to any limitations stated in the notice.
3. If, on the basis of the final inspection, the Goods and Special Services are non-conforming, Buyer will identify the non-conformity in writing.

9.03 *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 9.04, 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 Procurement Task Order Times, remove and replace the rejected Goods.

2. Seller shall bear all costs, losses and damages attributable to the removal, replacement, reinspection, and retesting of the non-conforming Goods.
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. *Buyer's Rejection of Non-Conforming Special Services*

1. If at any time Buyer elects to reject the Special Services in whole or in part, Buyer's notice to Seller will describe in sufficient detail the non-conforming aspect of the Special Services.
2. Seller shall promptly provide conforming Special Services acceptable to Buyer.
3. If Seller fails to provide conforming Special Services, Buyer may remove the Special Services from the scope of the Procurement Task Order, and equitably reduce the Procurement Task Order Price.

D. *Remedying Non-Conforming Goods:* 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.

E. *Buyer's Acceptance of Non-Conforming Goods:* 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.

F. *Seller Obligations:* 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 will 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.

G. *Buyer's Rejection of Conforming Goods:* 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.

9.04 *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 acceptance of the Goods and Special Services in accordance with Paragraph 9.02.C.2.
- B. Where non-conforming Goods and Services (and damage to other work resulting therefrom) have been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Goods and Services will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- C. Seller's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph may not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 10—ENGINEER'S STATUS

10.01 *Engineer's Role Defined*

- A. Engineer will be Buyer's representative until assignment (if any) of the Procurement Task Order.
- B. The duties and responsibilities and the limitations of authority of Engineer prior to assignment, if any, of the Procurement Task Order, are set forth in the Procurement Task Order Documents.
- C. Engineer's responsibilities, if any, after an assignment (if any) of the Procurement Task Order, are set forth in the Procurement Agreement.

10.02 *Duties and Responsibilities; Authority; Limitations*

- A. As set forth in Article 3, Engineer will be the initial interpreter of the Procurement Task Order Documents and judge of the acceptability of the Goods and Special Services, and will issue clarifications, interpretations, and decisions regarding such issues.
- B. Acting on behalf of Buyer under the provisions of Article 9, Engineer has the authority to disapprove or reject Goods and Special Services that Engineer believes to be non-conforming. Engineer also has the authority to require special inspection or testing of the Goods or Special Services as provided in Paragraph 9.02, whether or not the Goods are fabricated or installed, or the Special Services are completed.
- C. Engineer may authorize minor deviations or variations in the Procurement Task Order Documents by: 1) written approval of specific variations set forth in Shop Drawings when Seller has duly noted such variations as required in Paragraph 7.06.A.3, or 2) a Field Order.
- D. As set forth in Article 12, Engineer will review Claims, and render decisions on Claims.
- E. In rendering any interpretations, clarifications, reviews, decisions, disapprovals, acceptances, rejections, authorizations, and judgments, Engineer will not show partiality to Buyer or Seller. Engineer will not be liable to Buyer, Seller, or others in connection with any interpretations, clarifications, reviews, decisions, disapprovals, acceptances, rejections, authorizations, or judgments conducted or rendered by Engineer in good faith.

- F. Engineer will not supervise, direct, control, or have authority over or be responsible for the means, methods, techniques, sequences, or procedures used by Seller to perform its obligations under this Procurement Task Order, or the safety precautions and programs incident thereto, or for any failure of Seller to comply with Laws and Regulations applicable to the performance of its obligations. Engineer will not be responsible for Seller's failure to furnish the Goods and Special Services in accordance with the Procurement Task Order Documents.

ARTICLE 11—CHANGES

11.01 *Amending and Supplementing the Procurement Task Order*

- A. The Procurement Task Order may be amended or supplemented by a Change Order, a Change Directive, or a Field Order.
- B. If an amendment or supplement to the Procurement Task Order includes a change in the Procurement Task Order Price or the Procurement Task Order Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Procurement Task Order that involve (1) the conformance or acceptability of the Goods and Special Services, (2) the design (as set forth in the Procurement Drawings, Procurement Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Buyer and Seller may amend other terms and conditions of the Procurement Task Order without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Buyer and Seller shall execute appropriate Change Orders covering:
 - 1. Changes in Procurement Task Order Price or Procurement Task Order Times which are agreed to by the parties, including any undisputed sum or amount of time for Goods and Special Services furnished in accordance with a Change Directive;
 - 2. Changes in Procurement Task Order Price resulting from a Buyer set-off, unless Seller has duly contested such set-off;
 - 3. Changes in the Goods and Special Services which are: (a) ordered by Buyer pursuant to Paragraph 11.05, (b) required because of Buyer's acceptance of non-conforming Goods and Services under Paragraph 9.03 or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Goods and Special Services involves the design (as set forth in the Procurement Drawings, Procurement Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Change Directive; Article 12, Claims; and similar provisions.
- B. If Buyer or Seller refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Change Directives*

- A. A Change Directive will not change the Procurement Task Order Price or the Procurement Task Order Times but is evidence that the parties expect that the modification ordered or

documented by a Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Change Directive's effect, if any, on the Procurement Task Order Price and Procurement Task Order Times; or, if negotiations are unsuccessful, by a determination under the terms of the Procurement Task Order Documents governing adjustments, expressly including Paragraph 11.08 regarding change of Procurement Task Order Price.

- B. If Buyer has issued a Change Directive and Buyer or Seller believes that an adjustment in Procurement Task Order Times or Procurement Task Order Price is necessary, then such party shall submit a Claim seeking such an adjustment no later than 30 days after the completion of the Goods and Services set out in the Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Goods and Services if the changes do not involve an adjustment in the Procurement Task Order Price or the Procurement Task Order Times and are compatible with the design concept as indicated by the Procurement Task Order Documents. Such changes will be accomplished by a Field Order and will be binding on Buyer and also on Seller, which shall perform the Goods and Special Services involved promptly.
- B. If Seller believes that a Field Order justifies an adjustment in the Procurement Task Order Price or Procurement Task Order Times, then before proceeding with the Goods and Special Services at issue, Seller shall submit a Claim as provided herein.

11.05 *Buyer-Authorized Changes in the Goods and Special Services*

- A. Without invalidating the Procurement Task Order and without notice to any surety, Buyer may, at any time or from time to time, order additions, deletions, or revisions in the Goods and Special Services. Changes involving the design (as set forth in the Procurement Drawings, Procurement Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Goods and Special Services may be accomplished by a Change Order, if Buyer and Seller have agreed as to the effect, if any, of the changes on Procurement Task Order Times or Procurement Task Order Price; or by a Change Directive. Upon receipt of any such document, Seller shall promptly proceed with the Goods and Special Services involved; or, in the case of a deletion in the Goods and Special Services, promptly cease activities with respect to such deletion. Added or revised Goods and Special Services must be performed under the applicable conditions of the Procurement Task Order Documents.

11.06 *Buyer's Contingency Allowance*

- A. The Buyer's Contingency Allowance, if any such, is set forth in the Procurement Agreement, is for the sole use of Buyer to cover unanticipated costs.
- B. If Buyer exercises its unilateral right to use all or a portion of the Buyer's Contingency Allowance, Buyer will issue a written directive that documents the costs to which the allowance is applied, Seller's entitlement to compensation, and the consequent reduction in such allowance.
- C. Prior to final payment, the Total Price, as set forth in the Procurement Agreement, will be duly adjusted to account for any unused portion of the Buyer's Contingency Allowance.

- D. The Procurement Agreement, Article 5, addresses the impact on Buyer's Contingency Allowance of an assignment of the Procurement Task Order.

11.07 *Unauthorized Changes in the Goods and Special Services*

- A. Seller shall not be entitled to an increase in the Procurement Task Order Price or an extension of the Procurement Task Order Times with respect to any work performed that is not required by the Procurement Task Order Documents, as amended, modified, or supplemented.

11.08 *Change of Procurement Task Order Price*

- A. The Procurement Task Order Price may only be changed by a Change Order. Any Claim for an adjustment of Procurement Task Order Price must comply with the provisions of Article 12.
- B. An adjustment in the Procurement Task Order Price will be determined as follows:
 - 1. For changes in Unit Price Goods and Special Services, by application of the unit prices to the quantities of the items involved;
 - 2. To the extent the cost of the change is not covered by unit prices, then by a mutually agreed lump sum; or
 - 3. To the extent the cost of the change is not covered by unit prices and the parties do not reach mutual agreement to a lump sum, then on the basis of documented costs plus a Seller's fee for overhead and profit of 15%.

11.09 *Change of Procurement Task Order Times*

- A. The Procurement Task Order Times may only be changed by a Change Order. Any Claim for an adjustment in the Procurement Task Order Times must comply with the provisions of Article 12.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Goods and Special Services or the provisions of the Procurement Task Order (including, but not limited to, Procurement Task Order Price or Procurement Task Order Times), the giving of any such notice will be Seller's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS, DISPUTES, AND DISPUTE RESOLUTION

12.01 *Claims*

- A. 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 Claims process, including the time periods established in this Paragraph 12.01; if so, a written record of such mutual agreement should be made and jointly executed.
- B. Claimant shall deliver to Engineer and the other party to the Procurement Task Order written notice of each Claim within 15 days after the occurrence of the event giving rise to the Claim.

- C. Claimant shall deliver written supporting data to Engineer and the other party within 45 days after such occurrence unless Engineer allows an additional period of time.
- D. 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.
- E. If Engineer does not render a formal written decision on a Claim within the time stated in Paragraph 12.01.D., 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.
- F. The rendering of a decision by Engineer pursuant to this Paragraph 12.01 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment) will be a condition precedent to any exercise by Buyer or Seller of such rights or remedies as either may otherwise have under the Procurement Task Order Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter. If the exercise of such rights or remedies will imminently be time-barred, a party may take actions necessary to preserve such rights and remedies notwithstanding the lack of the condition precedent referred to in this paragraph.
- G. If a submitted matter in question concerns terms and conditions of the Procurement Task Order Documents that do not involve (1) the performance or acceptability of Goods and Special Services under the Procurement Task Order Documents, (2) the design (as set forth in the Procurement Drawings, Procurement Specifications, Addenda, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Buyer and Seller that Engineer is unable to provide a decision or interpretation. If Buyer and Seller are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Paragraph 12.02.
- H. 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 12.01, 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 Paragraph 12.02.
- I. If Article 12 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 12, 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.
- J. No Claim for an adjustment in Procurement Task Order Price or Procurement Task Order Times will be valid if not submitted in accordance with Article 12.

12.02 *Dispute Resolution Method*

- A. Either Buyer or Seller may initiate the mediation of (1) any Claim decided in writing by Engineer under Paragraph 12.01 before such decision becomes final and binding, or (2) any other dispute between the parties, including but not limited to any dispute arising after final inspection of the Goods and Services. 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 Procurement Task Order. The request for mediation must be submitted in writing to the American Arbitration Association and the other party to the Procurement Task Order. Timely submission of the request will stay Engineer's decision from becoming final and binding.

- B. Mediation is a condition precedent to seeking final dispute resolution under Paragraph 12.01.C. Buyer and Seller shall participate in the mediation process in good faith. The process must be concluded within 60 days of filing of the request. The date of termination of the mediation will be determined by application of the mediation rules referenced above.
- C. If the mediation process does not result in resolution of the dispute, then Engineer's written Claim decision under Paragraph 12.01.D or a Claim denial pursuant to Paragraph 12.01.E becomes final and binding, or if applicable such other dispute is deemed resolved in favor of respondent, unless, within 30 days after termination of the mediation, Buyer or Seller:
 - 1. elects in writing to invoke any final dispute resolution process provided for in the Supplementary Conditions, or
 - 2. agrees with the other party to submit the Claim or dispute to another final dispute resolution process, or
 - 3. if no final 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 or dispute to a court of competent jurisdiction, and within 60 days of the termination of the mediation institutes such formal proceeding.

ARTICLE 13—PAYMENT

13.01 *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 Procurement Task Order Documents and also as Buyer or Engineer may reasonably require.
- B. The timing and amounts of progress payments will be as stipulated in the Procurement Agreement.
- C. Any Application for Payment that is based in whole or in part on the delivery of Goods must 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.
- D. Buyer shall notify Seller promptly of any deficiency in the required documentation.

13.02 *Review of Applications for Progress Payments*

- A. *Review of Applications*
 - 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Buyer, or return the Application to Seller indicating in writing Engineer's reasons for refusing to recommend payment.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Buyer, based on Engineer's observations of Seller's progress, as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Goods and Special Services or other obligations of Seller have progressed to the point indicated;
 - b. the quality of the Goods and Special Services or other obligations of Seller are generally in accordance with the Procurement Task Order Documents; and
 - c. the conditions precedent to Seller being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Seller's progress.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Goods and Special Services or other obligations of Seller have been exhaustive, extended to every aspect of the Goods and Special Services or other obligations of Seller in progress, or involved detailed inspections of the Goods and Special Services or other obligations of Seller beyond the responsibilities specifically assigned to Engineer in the Procurement Task Order; or
 - b. there may not be other matters or issues between the parties that might entitle Seller to be paid additionally by Buyer, or entitle Buyer to withhold payment to Seller.
4. Neither Engineer's review of Seller's progress for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Seller's performance or furnishing of Goods and Special Services or other obligations of Seller; or
 - b. for the means, methods, techniques, sequences, or procedures of construction, manufacturing, fabrication, installation, or shipping, or the safety precautions and programs incident thereto; or
 - c. for Seller's failure to comply with Laws and Regulations applicable to Seller's performance under the Procurement Task Order; or
 - d. to make any examination to ascertain how or for what purposes Seller has used the money paid for the Procurement Task Order Price; or
 - e. to determine that title to any of the Goods or component parts have passed to Buyer free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Buyer stated in Paragraph 13.02.A.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Buyer from loss because:

- a. the Goods and Services are non-conforming, requiring correction or replacement;
- b. the Procurement Task Order Price has been reduced by Change Orders;
- c. Buyer has been required to correct non-conforming Goods and Special Services in accordance with Paragraph 9.03.C, or has accepted non-conforming Goods and Special Services pursuant to Paragraph 9.03.E; or
- d. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Seller and therefore justify termination for cause under the Procurement Task Order Documents.

13.03 *Basis and Amount of Progress Payments*

- A. The basis and amounts of the progress payments will be as provided in the Procurement Agreement, subject to the provisions of this Article 13 regarding reductions in payment.

13.04 *Suspension of or Reduction in Payment*

- A. Buyer may temporarily cease making progress payments, or reduce the amount of a progress payment, 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 Procurement Task Order 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 Procurement Task Order Documents, and Seller has failed to provide adequate assurances within ten days of Buyer's written request.
 - 3. In addition to any reductions in payment (set-offs) recommended by Engineer, Buyer is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Buyer based on Seller's conduct in the performance or furnishing of the Goods and Special Services, or has incurred costs, losses, or damages resulting from Seller's conduct in the performance or furnishing of the Goods and Special Services, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Seller has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Point of Destination or the worksite;
 - c. Seller has failed to provide and maintain required bonds or insurance;
 - d. Buyer has incurred extra charges or engineering costs related to Submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - e. the Goods and Special Services are non-conforming, requiring correction or replacement;
 - f. Buyer has been required to correct non-conforming Goods and Special Services, in accordance with Paragraph 9.03.C, or has accepted non-conforming Goods and Special Services pursuant to Paragraph 9.03.E;

- g. the Procurement Task Order Price has been reduced by Change Orders;
 - h. an event that would constitute a default by Seller and therefore justify a termination for cause has occurred;
 - i. liquidated or other damages have accrued as a result of Seller's failure to achieve Milestones, Substantial Completion, or final completion of the Goods and Special Services; or
 - j. liens have been filed in connection with the Procurement Task Order, except where Seller has delivered a specific bond satisfactory to Buyer to secure the satisfaction and discharge of such liens.
- 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.

13.05 *Final Payment*

- A. After Seller has corrected all non-conformities to the reasonable satisfaction of Buyer and Engineer and furnished all Special Services, Seller may submit its final Application for Payment following the procedures for progress payments.
- B. The final Application for Payment will be accompanied by all documentation called for in the Procurement Task Order Documents (including but not limited to all final operations and maintenance manuals, and any special warranties), a list of all unsettled Claims, and the written consent of surety to the making of final payment.
- C. 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 Procurement Task Order Documents, and that Seller has fulfilled all other obligations under the Procurement Task Order Documents, then Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment subject to the provisions of Paragraph 13.02, and present the final Application for Payment to Buyer. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Buyer from loss for the reasons stated in Paragraph 13.02.
- D. If Engineer does not recommend final payment, Engineer will return the final Application for Payment to Seller, indicating the reasons for refusing to recommend final payment, in which case Seller shall make the necessary corrections and resubmit the final Application for Payment.
- E. In support of its recommendation of final payment Engineer will also give written notice to Buyer and Seller that the Goods and Special Services are acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 13.06.
- F. If the final Application for Payment 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, pursuant to the provisions of Paragraph 13.04.

- G. Buyer will not make final payment, or return or release included retainage (if any) at any time, unless Seller submits written consent of the surety to such payment, return, or release.

13.06 *Waiver of Claims*

- A. By making final payment, Buyer waives its claim or right to liquidated damages or other damages for late completion by Seller, except as set forth in an outstanding Claim, appeal, set-off, or express reservation of rights by Buyer. Buyer reserves all other claims or rights after final payment.
- B. The acceptance of final payment by Seller will constitute a waiver by Seller of all claims and rights against Buyer other than those pending matters that have been duly submitted or appealed under the provisions of Article 12.

ARTICLE 14—CANCELLATION, SUSPENSION, AND TERMINATION

14.01 *Cancellation*

- A. Buyer has the right to cancel the Procurement Task Order, without cause, at any time prior to delivery of the Goods by written notice. Cancellation pursuant to the terms of this paragraph will 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 Procurement Task Order Price of such Goods.

14.02 *Suspension of Performance by Buyer*

- A. Buyer has the right to suspend performance of the Procurement Task Order for up to 90 days, without cause, by written notice. Upon suspension under this paragraph, Seller shall be entitled to an increase in the Procurement Task Order Times and Procurement Task Order Price caused by the suspension, provided that performance would not have been suspended or delayed for causes attributable to Seller.

14.03 *Suspension of Performance by Seller*

- A. 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 Procurement Task Order; and
 - 2. Seller has requested in writing assurances from Buyer that future payments will be made in accordance with the Procurement Task Order, and Buyer has failed to provide such assurances within ten days of Seller's written request.

14.04 *Breach and Termination*

A. *Buyer's Breach*

- 1. Seller shall have the right to terminate the Procurement Task Order for cause by declaring a breach if Buyer fails to comply with any material provision of the

Procurement Task Order. Upon termination, Seller shall be entitled to all remedies provided by Laws and Regulations.

2. If Seller believes Buyer is in breach of its obligations under the Procurement Task Order, 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 7 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. Buyer may terminate Seller's right to perform the Procurement Task Order for cause by declaring a breach should Seller fail to comply with any material provision of the Procurement Task Order Documents. Upon termination, Buyer shall be entitled to all remedies provided by Laws and Regulations.
2. In the event Buyer believes Seller is in breach of its obligations under the Procurement Task Order, 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 7 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.
3. If and to the extent that Seller has provided a performance bond under the provisions of Paragraph 5.01, the notice and cure procedures of that bond, if any, will supersede the notice and cure procedures of Paragraph 14.04.B.2.

ARTICLE 15—MISCELLANEOUS

15.01 *Giving Notice*

- A. Whenever any provision of the Procurement Task Order requires the giving of written notice to Buyer, Seller, or Engineer, it will be deemed to have been validly given if delivered:
 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

15.02 *Controlling Law*

- A. This Procurement Task Order is to be governed by the law of the state in which the Goods are to be installed.
- B. In the case of any conflict between the express terms of this Procurement Task Order 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 Procurement Task Order will apply.

15.03 *Computation of Time*

- A. When any period of time is referred to in the Procurement Task Order by number of days, it will be computed to exclude the first and include the last day of such period. If the last day

of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

15.04 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 Procurement Task Order, and the provisions of this paragraph will be as effective as if repeated specifically in the Procurement Task Order in connection with each particular duty, obligation, right, and remedy to which they apply.

15.05 Survival of Obligations

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

15.06 Entire Agreement

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

15.07 No Waiver

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Procurement Task Order.

15.08 Headings

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

15.09 Successors and Assigns

- A. 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 Procurement Task Order.

15.10 Limitation of Damages

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Seller for any claims, costs, losses, or damages sustained by Seller on or in connection with any other project or anticipated project.

15.11 Assignment of Task Order

- A. Unless expressly agreed to elsewhere in the Task Order, no assignment by a party to this Task Order of any rights under or interests in the Task Order will be binding on the other party

without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Task Order.

15.12 *Severability*

- A. Any provision of this Task Order which shall prove to be invalid, void or illegal shall in no way affect, impair or invalidate any other provision hereof, and such remaining provisions shall remain in full force and effect.

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SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

- A. Requirements for the submittal of information that will enable determination of whether the Contractor's proposed materials, equipment or methods of work are in general conformance to the design concept and in compliance with the Contract Documents.
- B. Furnish drawings, specifications, descriptive data, certificates, samples, test results, methods, schedules, manufacturer's installation instructions and other information as indicated.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 99 00 – Reference Forms

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the materials and equipment incorporated into the Work, or the methods of performing the Work shall be as described in the accepted submittals.
- B. Verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment that are being submitted for review. Extraneous materials shall be crossed out or otherwise obliterated.
- C. Coordinate submittals among subcontractors and suppliers. Ensure that there is no conflict with other submittals and notify the Engineer in each case where this submittal may affect the work of another contractor or the Owner, including those submittals complying with unit responsibility requirements specified in applicable technical sections.
- D. Coordinate submittals with the Work so that work will not be delayed. Coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. No extension of time will be allowed because of failure to properly schedule submittals.
- E. Do not proceed with work related to a submittal until the submittal process is complete and the submittal has received a response "No Exceptions Taken" or "Make Corrections Noted."
- F. Certify on each submittal document that the Contractor has reviewed the submittal, verified field conditions, and complied with the contract documents.
 - 1. Include a copy of the specification section with addendum updates, all referenced and applicable sections, and each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.

- a. Use check marks (✓) to denote full compliance with a paragraph as a whole.
 - b. If deviations from the specifications are indicated and therefore requested by the Contractor, underline each deviation, and denote by a number in the margin to the right of the identified paragraph.
 - c. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications.
 - d. Include a detailed, written justification for each deviation.
2. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

1.04 REVIEW COSTS

- A. The Owner's cost for review of submittals for the same proposed materials, equipment or work will be apportioned as follows:
 - 1. The cost of review of the initial submittal and the first revised submittal will be borne by the Owner.
 - 2. The cost to review all additional revised submittals after the first revised submittal will be charged to the Contractor. The cost of review shall include, without limitation, administrative, design and engineering activities directly related to review of submittals.

1.05 SUBMITTAL INDEX

- A. Within 30 days of the Notice to proceed, submit a list, by specification section, of all submittals to be submitted.
- B. Update and resubmit the submittal index on a monthly basis where additional submittals are identified, or as necessary

1.06 CATEGORIES OF SUBMITTALS

- A. General
 - 1. Submittals fall into two general categories;
 - a. Submittals for review and comment require action by the Engineer.
 - b. Submittals that are primarily for information only do not require Engineer's approval.
- B. Submittals for Review and Comment
 - 1. Transmit submittals for review and comment to the Engineer. The Engineer will review the submittal for compliance with the Contract requirements and will provide written comments regarding acceptability.
- C. Submittals for Information Only
 - 1. Where specified, furnish submittals to the Engineer for information only. The Engineer may, at the Engineer's option, review, and comment on any product data.

2. Incomplete or inadequate product data will be returned to the Contractor for resubmittal.

1.07 TRANSMITTAL PROCEDURES

A. General

1. Transmit submittals regarding material and equipment under cover of a Shop Drawing/Transmittal Form See Section 01 99 00.
2. Use a separate form for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required.
3. Identify submittal documents common to more than one piece of equipment with all the appropriate equipment numbers.
4. Make submittals for various items with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.
5. Assign a unique sequential number on the transmittal form accompanying each item submitted.
 - a. Use the following format for original submittal numbers: "XXX"; where "XXX" is the sequential number assigned by the Contractor.
 - b. Use the following format for resubmittals: "XXX-Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 25B, for example, is the second resubmittal of submittal 25.

B. Electronic Submittals

1. Electronic submittals are preferred except as otherwise indicated.
2. Prepare electronic submittals and Shop Drawings in electronic (*.pdf) format including half-sized and full-sized drawings, catalog information and other required submittal information.
3. Break down submittals that are larger than 10 megabytes into smaller sections, using logical division points to create sections.
4. Electronically bookmark electronic submittals greater than 30 pages in length by major submittal section to facilitate ease of navigation.

C. Paper copy submittals are not an acceptable alternative to electronic submittals except for samples.

D. Deviation from Contract

1. If the Contractor proposes to provide material, equipment, or method of work that deviates from the project manual, so indicate under "Proposed Deviations" on the transmittal form accompanying the submittal copies.

E. Submittal Completeness

1. Submittals that do not have all the information required to be submitted, including deviations, are not acceptable and will be returned without review.

1.08 SUBMITTAL CONTENT

A. Prepare submittals in compliance with individual Specification Sections and as indicated herein.

B. Shop Drawings:

1. Develop project-specific, scaled drawings to fully identify materials and products that will be provided and their relationship to other products that will be furnished and installed.
2. Do not utilize reproductions of the Contract Documents as the basis for the submittal.
3. Identify products, assemblies, equipment, and systems.
4. Provide equipment identification numbers or tag numbers, wiring diagrams, and setting diagrams.
5. Identify critical dimensions.

C. Product Data:

1. Provide information necessary to demonstrate conformance with the specified requirements. Include performance curves, specifications, and wiring diagrams.
2. Product data may consist of manufacturer's standard catalog information and data sheets, marked to indicate the specific products that will be provided.
3. Provide supplemental information as necessary to fully demonstrate how products will be modified from the manufacture's standard products to meet the specification requirements.

D. Manufacturer's Instructions: Written or published information that establishes the manufacturer's recommendations, guidelines and procedures for handling and installation of products, equipment, and assemblies.

E. Samples: Mount, display or package samples in a manner that will facilitate review and establish workmanship and quality of materials.

1.09 SUBMITTAL REQUIREMENTS

A. When the Contract Documents require a submittal, submit the specified information as follows:

1. Submittals for Review and Comment:

- a. Electronic Submittal: Submit one electronic (*.pdf) submittal.

2. Submittals for Information Only:

- a. Electronic Submittal: Submit one electronic (*.pdf) submittal.

1.10 REVIEW PROCEDURE

A. General

1. The Engineer will review submittals within the processing time identified in paragraph "Processing Time" and return:
 - a. Electronic Submittal – a signed submittal response document, in (*.pdf) format.
 - b. Paper Copy Submittal – Two marked up copies of the submitted copies. The reproducible original will be retained by the Engineer.

B. Submittals for Review and Comment

1. The returned submittal will indicate one of the following actions:
 - a. "NO EXCEPTIONS TAKEN" – The material, equipment or work method complies with the project manual.
 - b. "MAKE CORRECTIONS NOTED" – Limited corrections are required.
 - 1) Provide a corrected copy where:
 - a) The information is to be included in the O&M data.
 - b) If requested by the Engineer.
 - c. "AMEND AND RESUBMIT" – The submittal is insufficient or contains incorrect data.
 - d. "REJECTED – SEE REMARKS" – The material, equipment, or work method does not comply with the project manual. Submittals with deviations that have not been identified clearly may be rejected.
2. For submittals marked "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED".
 - a. The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with any noted corrections.
3. For submittals marked "AMEND AND RESUBMIT" or "REJECTED – SEE REMARKS"
 - a. Contractor shall provide a typed letter responding to each of the Engineer's review comments with each resubmittal.
 - b. Except at its own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is submitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

C. Submittals for Information Only

1. The returned submittal will indicate "ACCEPTED FOR RECORD" if the submittal is complete and adequate.
2. Engineer may return comments on information submittals to identify concerns with what was submitted, in such case, Contractor shall address concerns in writing and return a revised submittal.

1.11 PROCESSING TIME

- A. Prepare submittals and transmit to Engineer for review in sufficient time to allow Engineer's review; manufacture, fabrication or assembly of materials and systems; and shipping of material to the site in time for installation in accordance with the Contractor's schedule.
- B. Engineer's time for review will begin upon receipt of a complete and comprehensive submittal containing all required information.
- C. Engineer will review submitted information and transmit a response to Contractor within 21 days after receipt, subject to the following:
 - 1. In some instances, review times for specific submittals may be modified by the individual specification Section.
 - 2. Resubmittals will be subject to the same review time.
- D. No adjustment of Contract Time or Contract Price will be allowed due to delays in the progress of the Work that are caused by rejected submittals and subsequent resubmittals.

1.12 EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS

- A. The purpose of submittals is to demonstrate how Contractor intends to conform to the Contract Documents and design concepts. Engineer is entitled to rely upon the accuracy and completeness of designs, calculations, or certifications made by licensed professionals whether or not a stamp or seal is required by the Contract Documents.
- B. The review procedure is based on the Contractor's guarantee that all features and characteristics not requiring submittals conform to the contract documents.
- C. Review of contract drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide, does not relieve the Contractor of its responsibility for
 - 1. Fulfilling the requirements of the Contract,
 - 2. Proper operation of the equipment,
 - 3. Correction of defective work
- D. Reviews shall not be regarded as an assumption of risk or liability by the Engineer or the Owner.
- E. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" means that the Owner has no objection to the Contractor, upon its own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.
- F. The Engineer's review of shop drawings, samples, or test procedures will be only for conformance with design concepts and for compliance with information given in Contract Documents. The Engineer's review does not extend to:
 - 1. Accuracy of dimensions, quantities, or performance of equipment and systems designed by Contractor.
 - 2. Contractor's means, methods, techniques, sequences, or procedures except when specified, indicated on the Drawings, or required by Contract Documents.

3. Safety precautions or programs related to safety which shall remain the sole responsibility of the Contractor.
 - G. Review of a separate item does not indicate approval of the assembly in which the item functions.
- 1.13 SUBSTITUTIONS OR “OR EQUAL” ITEMS
- A. Named or Sole Source Times
 1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required.
 2. Unless the name designated a “sole source” and/or is followed by words indicating that no substitution is permitted, materials, or equipment of other Suppliers may be accepted by Engineer. Follow the procedures in the General Conditions.
 - B. Modification due to Substitutions
 1. All costs for redesign required by the implementation of the proposed substitute shall be borne by the Contractor.
 2. All costs associated with incorporating a substitution into the project shall be borne by the Contractor.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

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SECTION 01 61 10
SEISMIC DESIGN REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The following primary and secondary structural system elements, non-structural components, and/or equipment supported by structures.
 - 1. Mechanical, electrical, and plumbing equipment and appurtenances.
 - 2. Un-buried Conduit, piping, cable trays, raceways, ducts, and similar systems.
 - 3. Un-buried tanks and vessels (include contents), including support systems.
 - 4. Storage racks, suspended ceilings, light fixtures, raised floors, partitions, storefronts, windows, louvers, architectural features and other non-structural components.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 05 50 01 – Anchor Bolts and Anchoring Devices

1.03 REFERENCES

- A. Oregon Structural Specialty Code (OSSC), current governing edition.

1.04 DEFINITIONS

- A. Engineer of Record: The Engineer responsible for the preparation of Contract Documents.
- B. Specialty Engineer: Structural or Civil Engineer provided by the Contractor licensed in the State where the project is being built responsible for specific elements of the primary structural system, the secondary structural system, non-structural elements and/or equipment supported by structures.

1.05 GENERAL DESIGN REQUIREMENTS

- A. The Contractor is responsible for producing designs that resist the total seismic forces in accordance with the seismic design criteria.
- B. The Contractor is responsible for coordinating between the Engineer of Record and the Specialty Engineer.
- C. The seismic design for non-structural components and equipment shall be in accordance with the OSSC Chapter 16, and the required coefficients and factors for determining the total design seismic forces are provided in the Seismic Design Criteria in Paragraph E below.
- D. Coordinate the layout so that adequate space is provided between items for relative motion. Provide additional supports and restraints between items of different systems when necessary to prevent seismic impacts or interaction.

- E. Seismic forces shall be determined in accordance with the following seismic design criteria:
1. Site-Specific Spectral Response Coefficients
 - a. Short Period Mapped Maximum Considered Earthquake, 5 Percent Damped: $S_5=0.63g$
 - b. Short Period Mapped Maximum Considered Earthquake, 5 Percent Damped: $S_1=0.34g$
 - c. Short Period Design Spectral Response Acceleration, 5 percent Damped: $S_{DS} = 0.42$
 - d. 1 Second Period Design Spectral Response Acceleration, 5 percent Damped: $S_{D1} = 0.23$
 2. Site Class: B
 3. Seismic Design Category: D, unless noted otherwise
 4. Risk Category: III, unless noted otherwise
 5. Component Importance Factor, I_p :
 - a. Mechanical and Electrical Equipment: Use 1.0.
 - b. Tanks and Tank Anchorage: Use 1.0.
 - c. Components that contain hazardous materials: Use 1.5.
 - d. Components that are required for life safety: Use 1.5.
 - e. Components that must remain functional after an earthquake, such as fire protection sprinkler systems and egress stairways: Use 1.5.
 6. Do not use more than 60 percent of the weight of tanks and mechanical and electrical equipment for designing anchors for resisting overturning due to seismic forces.
 7. Consider both conditions of tanks being either empty or full for designing anchors for seismic forces.
 8. Do not use friction to resist sliding due to seismic forces.

1.06 DESIGN REQUIREMENTS FOR PIPING, CONDUIT, AND DUCTS

- A. The Contractor is responsible for producing designs for support of piping, conduit, duct or other systems to resist total seismic forces based on the seismic design criteria coefficients specified above, unless shown on the Contract Documents. Except where the technical specifications give specific exemption from resistance of seismic forces, all supports shall be designed to meet seismic criteria.
- B. Where possible, pipes, conduit, and their connections shall be constructed of ductile materials (e.g., copper, ductile iron, steel or aluminum and brazed, welded or screwed connections). Pipes, conduits and their connections, constructed of nonductile materials (e.g., cast iron, no-hub pipe and plastic), shall have the brace spacing reduced to one-half of the spacing allowed for ductile material.

- C. Seismic restraints may be omitted for the following conditions, where flexible connections are provided between components and the associated ductwork, piping and conduit:
 - 1. Where the nominal pipe size is 1 in. or less.
 - 2. Piping, conduit or ducts suspended by individual hangers 12 inches or less in length from the top of the component to the bottom of the structural support. Where rod hangers are used, they shall be equipped with swivels.
 - 3. Air-handling ducts less than 6 square feet in cross-sectional area.
 - 4. See the CBC for additional requirements related to the omitting of seismic bracing.
- D. All trapeze assemblies supporting pipes, ducts and conduit shall be braced to resist the total seismic forces considering the weight of the elements on the trapeze. Pipes, ducts and conduit supported by a trapeze where none of those elements would individually be braced need not be braced if connections to the pipe/conduit/ductwork or directional changes do not restrict the movement of the trapeze. If this flexibility is not provided, bracing will be required when the aggregate weight of the pipes and conduit exceed 10 pounds/foot. The weight shall be determined assuming all pipes and conduit are filled with water.
- E. As an alternative to designing the supports and anchorage, where an approved national standard provides a basis for the earthquake-resistant design, submit standard, data, and details for piping, conduit, duct or other systems:
 - 1. For ductwork, mechanical piping, process piping and electrical conduits, follow Guidelines for Seismic Restraints of Mechanical Systems by SMACNA modified as follows:
 - a. Seismically brace piping regardless of size or location. Provide transverse braces at all changes in direction and at the end of all pipe runs. Space transverse braces not more than 20 feet apart. Provide longitudinal braces at 40-foot centers.
 - b. Seismically brace all ductwork regardless of size or location. Provide transverse braces at all changes in direction and at each end of run. Space braces not over 20 feet apart. Provide longitudinal braces at 40-foot centers.
 - 2. For fire protection systems, follow NFPA 13 modified as in Paragraph 1.b above. Ensure that no seismic interaction occurs with items of other systems.

1.07 DESIGN REQUIREMENTS FOR UNDERWATER ITEMS

- A. To allow for water sloshing, design rigid items such as piping or equipment supports for twice the lateral force, computed as if the item were above water. Alternatively, include seismic forces due to hydrodynamic forces in the analysis.
- B. Design flexible items to accommodate sloshing motions without damage to rigid machinery.
- C. Provide retainers to hold items from falling and damaging rotating equipment below, if bolted connections will fail because of ground motion displacing the supports.

1.08 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Shop Drawings: Submit structural calculations and detailed drawings signed and sealed by a civil or structural engineer for the following listed elements and where required in Divisions 2 through 16 of the primary structural system and their attachments, the secondary structural system and their attachments, permanent non-structural components and their attachments, and the attachments and anchorage for all permanent equipment supported by the structures.
 - 1. Electrical and Information Technology Equipment
 - 2. Submersible Solids Handling Pumps and Piping Systems
 - 3. Standby Generators
 - 4. Suspended Ceilings
- C. Structural calculations and detailed drawings shall be prepared by a Specialty Engineer licensed in the State where the project is being built.
- D. Structural calculations and detailed drawings shall clearly show the total design seismic forces which will be transferred from the elements of the structural system, non-structural components, and/or equipment and their attachments to the primary structure.
- E. The Engineer's review of items within a Specification Section cannot be completed until all related items have been coordinated and submitted for review.
- F. Quality Assurance Submittals
 - 1. Test Reports: Submit test reports for tension testing of anchors.
 - 2. Where required in the equipment specifications in Divisions 2 through 16 submit certification that the equipment itself is designed to resist all internal seismic forces based on the seismic design criteria for the project.
 - 3. Where required in the equipment specifications in Divisions 2 through 16, submit signed and sealed structural calculations and detailed drawings from a specialty Structural or Civil Engineer licensed in the State where the project is being built for the attachments and anchorage to the primary structure.
 - 4. Where required in the equipment specifications in Divisions 2 through 16, submit certification that the attachments and anchorage are designed to resist all seismic forces based on the seismic design criteria for the project.

1.09 QUALITY ASSURANCE

- A. Qualifications: The Contractor is responsible for submitting signed and sealed structural calculations and detailed drawings from a Specialty Structural or Civil Engineer licensed in the State where the project is being built.
- B. Regulatory Requirements: Comply with the State of Oregon adopted and amended versions of Oregon Structural Specialty Code (OSSC) Chapter 16 - Earthquake Design plus clarifications and additions specified in this Section.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

A. Site Tests:

1. Tension testing of expansion or adhesive anchors utilized for anchorage shall be done in the presence of the special inspector and a report of the test results shall be submitted.
2. See Section 05 50 01 for additional requirements.

B. Inspection:

1. Provide special inspection for high strength bolting or bolts installed in concrete.
2. See Section 05 50 01 for additional requirements.

END OF SECTION

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SECTION 01 61 11
SEISMIC ANCHORAGE AND BRACING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for seismic anchorage and bracing for equipment, tanks and nonstructural components.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 61 10– Seismic Design Requirements
 - 3. Section 05 50 01– Anchor Bolts and Anchoring Devices
 - 4. Section 46 05 13 – General Requirements for Equipment
 - 5. Section 46 05 14 – Equipment Mounting

1.03 AREAS OF DESIGN RESPONSIBILITY

- A. The Screw Press Dewatering Equipment Manufacturer (Manufacturer) shall be responsible for designing all seismic attachments, braces, and anchors for tanks, mechanical equipment, piping, and electrical equipment included in their Scope of Work that weigh more than 20 pounds.
- B. The Manufacturer may provide standard design calculations and details for their specific pieces of equipment as part of the submittal for that equipment. Project-specific design calculations and details need not be produced unless the Manufacturer does not already have standard designs already prepared.

1.04 REFERENCES

- A. The following is a list of standards which may be referenced in this section.
 - 1. International Code Council (ICC)
 - a. International Building Code (IBC)
 - b. Evaluation Service (ICC-ES) Reports and Legacy Reports
 - 2. American Society of Civil Engineers (ASCE)
 - a. ASCE 7, Minimum Design Loads for Building and Other Structures.
 - 3. Oregon Structural Specialty Code (OSSC)

1.05 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Seismic Anchorage and Bracing Calculations
 - 1. Submit manufacturer's engineered seismic hardware data and installation requirements.

2. Provide calculations for seismic attachments, braces and anchorages clearly showing the criteria used for the design. Calculations for anchorage of components shall be signed and sealed by a registered Professional Engineer.
- C. Shop Drawings: Show details of seismic attachment assemblies including connection hardware, bracing, and anchor bolts.

1.06 DESIGN AND PERFORMANCE REQUIREMENTS

- A. In accordance with IBC, tanks, mechanical and electrical components, and other elements of the Work that are permanently attached to structures shall be designed and constructed to transfer the component seismic forces specified in ASCE 7, Chapter 13 to the structure.
- B. Seismic attachments, braces, and anchorages shall be designed in accordance with the provisions of the IBC and the site-specific seismic criteria in Section 01 61 10.
- C. Comply with Sections 46 05 13 and 46 05 14.
 1. Do not use more than 60 percent of the weight of tanks and mechanical and electrical equipment for designing anchors for resisting overturning due to seismic forces.
 2. Do not use friction to resist sliding due to seismic forces.
- D. In accordance with ASCE 7, the following are exempt from the requirements of this Section:
 1. Mechanical and electrical components with a Component Importance Factor of = 1.0 that weigh 400 pounds or less, are mounted 4 feet or less above the adjacent finished floor elevation, and are provided with flexible connections between the components and any associated ductwork, piping, or conduit.
 2. Mechanical and electrical components with a Component Importance Factor of = 1.0 that weigh 20 pounds or less, are mounted at any height, and are provided with flexible connections to attached ductwork, piping, and conduit.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Attachments and supports transferring seismic loads to the structure shall be constructed of materials and products suitable for the application and designed and constructed in accordance with the design criteria shown on the Drawings and nationally recognized standards.
- B. Do not use powder driven fasteners and sleeve anchors for seismic attachments and anchorages where resistance to tension loads is required.
- C. Anchor Bolts: In accordance with Section 05 50 01.

PART 3 - EXECUTION

3.01 GENERAL

- A. Design seismic anchorage systems to provide restraint in all directions, for each component or system so anchored.

- B. Anchor tall and narrow equipment such as motor control centers and electrical control panels at the base and within 12 inches from the top of the equipment.
- C. Mechanical and electrical components shall not be attached to more than one element of a building structure at a single restraint location where such elements may respond differently during a seismic event. Such attachments shall also not be made across building expansion and contraction joints.
- D. Provide and install seismic attachments and braces in accordance with the size and number of braces determined by the design calculations prepared by the Contractor.
- E. Provide and install anchor bolts and concrete and masonry anchors for the anchorage of equipment in accordance with the bolt sizing, minimum embedment, and spacing requirements determined by the calculations prepared by the Contractor.

END OF SECTION

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SECTION 01 61 50
WIND DESIGN CRITERIA

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The following primary and secondary structural system elements, non-structural components, and/or equipment supported by structures.
 - 1. Mechanical, electrical, and plumbing equipment and appurtenances.
 - 2. Un-buried Conduit, piping, cable trays, raceways, ducts, and similar systems.
 - 3. Un-buried tanks and vessels (include contents), including support systems.
- B. Storage racks, suspended ceilings, light fixtures, raised floors, partitions, storefronts, windows, louvers, architectural features and other non-structural components.

1.02 REFERENCED SECTIONS

- A. The following Section is referenced in this Section
 - 1. Section 01 33 00 – Submittals

1.03 REFERENCES

- A. Oregon Structural Specialty Code (OSSC), current governing edition.

1.04 DEFINITIONS

- A. Engineer of Record: The Engineer responsible for the preparation of Contract Documents.
- B. Specialty Engineer: Structural or Civil Engineer provided by the Contractor licensed in the State where the project is being built responsible for specific elements of the primary structural system, the secondary structural system, non-structural elements and/or equipment supported by structures.

1.05 GENERAL DESIGN REQUIREMENTS

- A. The Contractor is responsible for producing designs that resist the total wind forces in accordance with the wind design criteria.
- B. The Contractor is responsible for coordinating between the Engineer of Record and the Specialty Engineer.
- C. The wind design for non-structural components and equipment shall be in accordance with the OSSC Chapter 16, and the required coefficients and factors for determining the total design wind forces are provided in the Wind Design Criteria in Paragraph E below.
- D. Coordinate the layout so that adequate space is provided between items for relative motion. Provide additional supports and restraints between items of different systems when necessary to prevent wind impacts or interaction.
- E. Design in accordance with the requirements of the following:
 - 1. Risk Category: III
 - 2. Basic Wind Speed: $V = 104$ mph.

3. Wind Exposure Category: B
4. Wind Importance Factor: $I = 1.0$

1.06 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Shop Drawings: Submit structural calculations and detailed drawings signed and sealed by a civil or structural engineer for the following listed elements and where required in Divisions 2 through 16 of the primary structural system and their attachments, the secondary structural system and their attachments, permanent non-structural components and their attachments, and the attachments and anchorage for all permanent equipment supported by the structures.
 1. Electrical and Information Technology Equipment
 2. Standby Generators
- C. Structural calculations and detailed drawings shall be prepared by a Specialty Engineer licensed in the State where the project is being built.
- D. Structural calculations and detailed drawings shall clearly show the total design wind forces which will be transferred from the elements of the structural system, non-structural components, and/or equipment and their attachments to the primary structure.
- E. The Engineer's review of items within a Specification Section cannot be completed until all related items have been coordinated and submitted for review.
- F. Quality Assurance Submittals
 1. Test Reports: Submit test reports for tension testing of anchors.
 2. Where required in the equipment specifications in Divisions 2 through 16 submit certification that the equipment itself is designed to resist all internal wind forces based on the wind design criteria for the project.
 3. Where required in the equipment specifications in Divisions 2 through 16, submit signed and sealed structural calculations and detailed drawings from a specialty Structural or Civil Engineer licensed in the State where the project is being built for the attachments and anchorage to the primary structure.
 4. Where required in the equipment specifications in Divisions 2 through 16, submit certification that the attachments and anchorage are designed to resist all wind forces based on the wind design criteria for the project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 66 00
MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Materials, equipment and products incorporated into the work.

1.02 MATERIAL AND EQUIPMENT REQUIREMENTS

- A. Specified in individual technical specification Sections in Divisions 02 through 11.
- B. Specifications are minimum requirements and manufacturers' standard products may require modifications to meet the specified requirements.
- C. Provide products and equipment with all accessories, trim, finish, safety guards and other devices needed for a complete and operational installation.
- D. Products to be supplied in quantity shall be the same product from a single source to provide standardization and interchangeability.

1.03 DEFINITIONS

- A. Named Products: Items identified by manufacturer's product name and model number as indicated in the manufacturer's published product data.
- B. Materials: Products that are shaped, cut, worked, finished or otherwise fabricated or installed to form a part of the Work.
- C. Equipment: A product with working parts, whether motorized or manually operated, that requires connections such as wiring or piping.

1.04 PACKAGING AND MARKING

- A. Equipment shall be protected against damage from moisture, dust, handling, or other cause during transport from manufacturer's premises to site. Each item or package shall be marked with the number unique to the specification reference covering the item.
- B. Stiffeners shall be used where necessary to maintain shapes and to give rigidity. Parts of equipment shall be delivered in assembled or subassembled units where possible.
- C. Bearing housings, vents and other types of openings shall be wrapped or otherwise sealed to prevent contamination by dust and dirt.

1.05 SHIPPING AND DELIVERY

- A. Plan, order, coordinate and deliver materials and equipment in accordance with the construction schedule to avoid delays and conflicts with the Work.
- B. Deliver anchor bolts and bolt templates sufficiently early to permit setting and placement in structural concrete.
- C. Unload products in accordance with the manufacturer's handling instructions. Promptly inspect for completeness and evidence of damage during shipment.

1.06 HANDLING AND STORAGE

- A. During the interval between the delivery of equipment to the site and installation, all equipment, unless otherwise specified, shall be stored in an enclosed space affording protection from weather, dust and mechanical damage and providing favorable temperature, humidity and ventilation conditions to ensure against equipment deterioration. Manufacturer's recommendations shall be adhered to in addition to these requirements.
- B. Equipment and materials to be located outdoors may be stored outdoors if protected against moisture condensation. Equipment shall be stored at least 6 inches above ground. Temporary power shall be provided to energize space heaters or other heat sources for control of moisture condensation. Space heaters or other heat sources shall be energized without disturbing the sealed enclosure.
- C. Fabricated products, pipe and pipe appurtenances shall be handled, stored off the ground on blocking or skids. Pipes with paint, tape coatings, linings or the like shall be stored to protect the coating or lining from physical damage or other deterioration. Pipes shipped with interior bracing shall have the bracing removed only when recommended by the pipe manufacturer.
- D. Store loose granular products in well-drained area on a solid surface to prevent mixing with foreign matter. Cover products that are subject to erosion or deterioration with plastic sheeting.
- E. Store electrical, instrumentation and control products in a water-tight enclosure to protect against damage from moisture, dust and corrosion.

1.07 PROTECTION OF EQUIPMENT AFTER INSTALLATION

- A. After installation, protect equipment from damage from, including but not limited to, dust, abrasive particles, debris and dirt generated by the placement, chipping, sandblasting, cutting, finishing and grinding of new or existing concrete, terrazzo and metal; and from the fumes, particulate matter, and splatter from welding, brazing and painting of new or existing piping and equipment.
- B. As a minimum, vacuum cleaning, blowers with filters, protective shielding, and other dust suppression methods will be required at all times to adequately protect all equipment.
- C. When sandblasting or when finishing concrete, all equipment that may be affected by cement dust shall be completely covered. Electrical switchgear, substations and motor load centers shall not be installed until after all concrete work and sandblasting in those areas have been completed and accepted and the ventilation systems installed.
- D. During painting operations, all grease fittings and similar openings shall be covered to prevent the entry of paint.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 INSPECTION

- A. Prior to installation, inspect materials and equipment for signs of corrosion and other effects of storage. Do not install material or equipment showing such effects.

- B. Remove damaged material from the site and expedite delivery of replacement material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays that are within the Contractor's control.

3.02 INSTALLATION

- A. Handle, install, connect, clean and adjust products in accordance with the manufacturer's instructions.
- B. Fill lubricant reservoirs and grease bearings prior to starting equipment. Use lubricants recommended by the manufacturer of the equipment.
- C. Recoat painted surfaces that are damaged prior to final acceptance of the Work.

END OF SECTION

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SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for Operation and Maintenance (O&M) manuals and related equipment data for incorporation into the Owner's asset management system.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 81 00 – Equipment and System Testing
 - 3. Section 01 99 00 – Reference Forms

1.03 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Provide the following completed forms with each submittal (See Section 01 99 00)
 - 1. Operational and Maintenance Information Transmittal Form
 - 2. Equipment Record Form A and B
 - 3. Asset Management Data Field Form
 - 4. Spare Parts Record Form
 - 5. Spare Parts Release Form
- C. The Equipment Records Form and Asset Management Field Data Form shall be the initial pages of the manual.
- D. Sixty days prior to the testing and startup of any equipment, as specified in Section 01 81 00, Equipment and System Testing, submit one electronic copy of the Preliminary Operation and Maintenance manuals. Identify copies as "Preliminary."
- E. Owner will complete review of preliminary O&M manuals and deliver review comments within 30 days of receipt.
- F. Provide four hard copies and two electronic copies of the final O&M Manual.

1.04 OPERATION AND MAINTENANCE MANUAL

- A. Operation and Maintenance Manuals shall contain all the information needed to operate, maintain and repair all systems and equipment and material provided in the Project. Group equipment and components by system, organized around unit processes shown in the process and instrumentation diagrams (P&IDs) and the control strategies. Match testing, training and commissioning systems as much as possible. The information provided shall include, but not be limited to, the following:
 - 1. General: The names, addresses, and telephone numbers of the manufacturer, the nearest manufacturer's representative, and the manufacturer's nearest supplier

of equipment and parts. Include the manufacturer's web site information. Provide performance curves for all pumps.

2. Operating Instructions:

- a. Safety Precautions: List personnel hazards for equipment and list safety precautions for all operating conditions.
- b. Operator Prestart: Provide requirements to set up and prepare each system for use.
- c. Start-up, Shutdown, and Post-Shutdown Procedures: Provide a control sequence for each of these operations.
- d. Normal Operations: Provide control diagrams; explain operation and control of systems and specific equipment. As applicable, provide baseline vibration, temperature, pressure, etc. readings.
- e. Emergency Operations: Provide emergency procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage. Include shutdown instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance on emergency operations of all utility systems including valve locations and portions of systems controlled.
- f. Service Requirements: Provide instructions for services to be performed by the operator such as lubrication, adjustments, and inspection.
- g. Environmental Conditions: Provide a list of environmental conditions (temperature, humidity, and other relevant data) which are best suited for each product and describe conditions under which products should not be allowed to run.

3. Preventive Maintenance:

- a. Lubrication Data: Provide a table showing recommended lubricants for specific temperature ranges and applications; provide charts with a schematic diagram showing lubrication points, recommended lubricants, and capacities; provide a lubrication schedule showing service interval frequency.
- b. Provide manufacturer's preventative maintenance schedule for routine inspections, tests, and adjustments required to ensure proper and economical operation and minimize repairs. Provide manufacturer's projection of preventive maintenance man-hours, by type of craft, on a daily, weekly, monthly, and annual basis.
- c. In addition, provide a customized maintenance schedule to be input into the Owner's asset management system using Maintenance Schedule (Section 01 99 00). The customized maintenance schedule shall include all preventive maintenance tasks identified in the preventive maintenance schedule specified above, listing tasks to be performed at specific calendar and usage intervals.

4. Corrective Maintenance:

- a. Troubleshooting Guides and Diagnostic Techniques: Provide step-by-step procedures to promptly isolate the cause of typical malfunctions.

Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

- b. Wiring and Control Diagrams: Provide point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job-specific wiring and control work. On diagrams, number electrical and electronic wiring terminals identically to actual installation.
- c. Maintenance and Repair Procedures: Provide instructions and list tools required to restore equipment to proper operational condition.
- d. Removal and Replacement Instructions: Provide step-by-step procedures and list required tools and supplies for removal, replacement, disassembly, and assembly of components, subcomponents, and accessories. Provide tolerances, dimensions, settings, and adjustments required. Include a combination of text and illustrations.
- e. Spare Parts and Supply Lists: Provide lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonably delays using Spare Parts Release Form (Section 01 99 00). Identify spare parts and supplies that require a long lead time. Provide list prices.
- f. Corrective Maintenance: Provide manufacturer's projection of corrective maintenance man-hours by type of craft. Separately identify and tabulate corrective maintenance requiring equipment manufacturer's participation.

5. Appendices:

- a. Parts Identification: Identify each component, subcomponent, and accessory subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification. When illustrations omit the part numbers and description, cross reference the illustrated part to the listed part. Group parts by components, subcomponents, and accessories.
- b. Training Requirements: Provide manufacturer's information for use in Owner training.
- c. Testing Equipment and Special Tool Information: Provide information on required test equipment; provide information on special tools needed for the operation, maintenance, and repair.

B. Deliver electronic copies on CD, USB flash drive or upload into the electronic construction document control system.

- 1. Electronic O&M manuals shall be in searchable Adobe Acrobat pdf format.
- 2. Where scanned pages are used, each scanned page shall be provided with a bookmark and identified in the index. In addition, annotate each scanned page

identifying the content. For example, for a scan of a Special Warranty, insert an annotation in the file stating “Special Warranty Documentation, Page 1.”

3. Index each manual with hyperlinks and bookmarks to each section.
4. Consistently orient all diagrams, drawings, pictures and illustrations.
5. Where Revit 3D drawing equipment blocks have been provided by equipment manufacturers, include equipment blocks as part of the electronic O&M manuals.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

SECTION 01 79 00

TRAINING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for training the Owner's personnel, by persons retained by the Contractor specifically for the purpose, in the proper operation and maintenance of the equipment and systems installed under this Contract.
- B. Coordinate with the equipment suppliers for all training activities and provide additional labor, services, and materials as required to complete training.

1.02 REFERENCED SECTIONS

- A. The following Section is referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 99 00 – Reference Forms

1.03 TRAINING SESSIONS

- A. Where required by the detailed specifications, provide on-the-job training of the Owner's personnel, which will include plant operations personnel, mechanics, electricians, and electronics technicians.
- B. The training sessions shall be conducted by qualified, experienced (2 years minimum), manufacturer's factory-trained representatives (not sales representatives) of the various equipment manufacturers.
- C. Include instruction in both equipment operation and preventive maintenance.
- D. Field training sessions shall take place at the project site. Classroom training facility will be provided at the site by the Owner.

1.04 TIMING OF TRAINING SESSIONS

- A. Conduct training sessions in conjunction with the operational testing and commissioning periods.
- B. Operation and maintenance manuals shall be approved and ready for distribution to the Owner's personnel at least 30 days prior to the date scheduled for the individual training session.

1.05 SUBMITTALS

- A. The following information shall constitute the Contractor's training plan and be submitted to the Engineer in accordance with the provisions of Section 01 33 00.
 - 1. Lesson plans for each training session to be conducted by the Contractor's representatives. In addition, training manuals, handouts, visual aids, and other reference materials shall be included.
 - 2. Date, time, and subject of each training session and identity and qualifications of individuals to be conducting the training.

3. Training schedule. Concurrent classes will not be allowed.
- B. Due to phased testing and start-up activities, Contractor may prepare separate submittals for individual equipment items and systems. The materials shall be reviewed and accepted by the Engineer no later than 3 weeks prior to delivery of the training.

PART 2 - PRODUCTS

2.01 LESSON PLANS

- A. Formal written lesson plans shall be prepared for each training session. Lesson plans shall contain an outline of the material to be presented along with a description of visual aids to be utilized during the session.
- B. Each lesson plan shall contain a time allocation for each subject.
- C. Furnish ten copies of the training manuals, handouts, and reference materials and one copy of necessary visual aids at least 1 week prior to each training session. These materials shall remain the property of the Owner and shall be suitably bound for proper organization and easy reproduction.

2.02 FORMAT AND CONTENT

- A. Each training session shall be comprised of time spent both in the classroom and at the specific location of the subject equipment or system.
- B. Content is as described in PART 3.

2.03 VIDEO RECORDING

- A. Record or retain the services of a commercial videotaping service to record, each training session. After taping, the material may be edited and supplemented with professionally produced graphics to provide a permanent record. Submit final digital training record to the City in electronic format.

PART 3 - EXECUTION

3.01 SCHEDULING TRAINING SESSIONS

- A. Classes shall be scheduled such that classroom sessions are interspersed with field instruction in logical sequence. Consolidate short training sessions into combined sessions so that staff time is more efficiently used. The minimum combined session length should be 1.5 to 2 hours. The maximum single or combined session length shall be 4 hours. The Contractor shall arrange to have the training conducted on consecutive days, with no more than 4 hours of classes scheduled for any one day. Contractor shall provide two training sessions on each system, piece of equipment, or "topic".
- B. No training sessions shall be scheduled for Mondays or Fridays. The Contractor shall coordinate the scheduling of training sessions with the operations superintendent.

3.02 TRAINING CONTENT

- A. The following services shall be provided for each item of equipment or system. Additional services shall be provided, where specifically required in individual specification sections.
 - a. At a minimum, classroom equipment training for operations personnel will include:

- b. Using slides and drawings, discuss the equipment's specific location in the plant and an operational overview.
 - c. Purpose and plant function of the equipment.
 - d. A working knowledge of the operating theory of the equipment.
 - e. Start-up, shutdown, normal operation, and emergency operating procedures, including a discussion on system integration and electrical interlocks, if any.
 - f. Identify and discuss safety items and procedures.
 - g. Routine preventative maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.
 - h. Operator detection, without test instruments, of specific equipment trouble symptoms.
 - i. Required equipment exercise procedures and intervals.
 - j. Routine disassembly and assembly of equipment if applicable (as judged by the City on a case-by-case basis) for purposes such as operator inspection of equipment.
2. At a minimum, hands-on equipment training for operations personnel will include:
- a. Identify location of equipment and review the purpose.
 - b. Identifying piping and flow options.
 - c. Identifying valves and their purpose.
 - d. Identifying instrumentation:
 - 1) Location of primary element.
 - 2) Location of instrument readout.
 - 3) Discuss purpose, basic operation, and information interpretation.
 - e. Discuss, demonstrate, and perform standard operating procedures and round checks.
 - f. Discuss and perform the preventative maintenance activities.
 - g. Discuss and perform start-up and shutdown procedures.
 - h. Perform the required equipment exercise procedures.
 - i. Perform routine disassembly and assembly of equipment if applicable.
 - j. Identify and review safety items and perform safety procedures, if feasible.
3. Classroom equipment training for the maintenance and repair personnel will include:
- a. Theory of operation.
 - b. Description and function of equipment.
 - c. Start-up and shutdown procedures.
 - d. Normal and major repair procedures.

- e. Equipment inspection and troubleshooting procedures including the use of applicable test instruments and the “pass” and “no pass” test instrument readings.
 - f. Routine and long-term calibration procedures.
 - g. Safety procedures.
 - h. Preventive maintenance such as lubrication; normal maintenance such as belt, seal, and bearing replacement; and up to major repairs such as replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.
4. Hands-on equipment training for maintenance and repair personnel shall include:
- a. Locate and identify equipment components.
 - b. Review the equipment function and theory of operation.
 - c. Review normal repair procedures.
 - d. Perform start-up and shutdown procedures.
 - e. Review and perform the safety procedures.
 - f. Perform City approved practice maintenance and repair job(s), including mechanical and electrical adjustments and calibration, and troubleshooting equipment problems.
 - g. Review and use equipment manufacturers’ manuals in the hands-on training.
5. Manufacturer’s Instruction Certification Form
- a. Provide a Manufacturer’s Instruction Certification using the Form from Division 01 99 00.
 - b. Circulate an attendance list at the end of the training for signature by the Owner’s staff in attendance. Append the attendance list to the Certification Form for submittal per Section 01 33 00.

END OF SECTION

SECTION 01 81 00
EQUIPMENT AND SYSTEM TESTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for the Contractor's testing of mechanical, electrical, and instrumentation equipment and systems provided under this Contract.
- B. The requirements contained in this Section supplement, but do not supersede, specific testing requirements found elsewhere in the Contract Documents.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 99 00 – Reference Forms

1.03 COORDINATION

- A. Coordinate with the equipment suppliers for functional and performance testing and facility startup. Minimum levels of on-site installation and testing assistance required of the equipment suppliers is described in separate Sections.
- B. Coordinate the activities of subcontractors and equipment suppliers to implement the requirements of this Section.

1.04 SUBMITTALS

- A. Prepare and submit in accordance with Section 01 33 00.
- B. Independent Testing Labs: When testing by an independent laboratory is specified, provide credentials and certifications to demonstrate capabilities.
- C. Test Instruments Calibration: Certification that test instruments used in the testing procedure have been calibrated to an acceptable and recognized standard.
- D. Testing Schedule: For each piece of equipment or system, provide a testing schedule and updates as appropriate. Submit at least 20 working days prior to the scheduled start of testing. Confirm the test schedule, or provide an updated schedule 4 days prior to the start of testing.
- E. Testing Plan: Describe step by step procedure that will be utilized to systematically test equipment and systems.
- F. Test Results:
 - 1. Factory Test Results: Results of equipment tests performed by the equipment supplier at the point of manufacture and prior to shipping the equipment to the site.
 - 2. Results of the Pre-Operational Test.
 - 3. Results of the Functional Test.

4. Results of the Operational and Performance Tests.
- G. Testing Form
 1. Section 01 99 00 contains a sample Instrumentation Data and Calibration Test Form showing the format and level of detail required for the documentation forms.
- H. Manufacturer's Field Certification
 1. Submit a Manufacturer's Installation Certification Form (Section 01 99 00) after the manufacturer's Field Representative has completed the specified field services and testing. Submit the certification prior to Manufacturer's Representative leaving the plant site.
- 1.05 DOCUMENTATION REQUIREMENTS
 - A. Develop and implement a records keeping system to document compliance with the requirements of this Section.
 - B. Document date of test, equipment number or system name, nature of test (performance or operational), test objectives, test results and test instruments used during the test. Provide signature spaces for the Engineer and the Contractor.
- 1.06 TEST PLANS
 - A. Develop test plans in cooperation with the equipment suppliers detailing the coordinated, systematic testing of each item of equipment and system provided under this Contract.
 - B. Make test plans specific to the item of equipment or system to be tested. Identify by specific equipment or tag number each device or control station to be manipulated, observed or tested during the test procedure and the specific results to be observed or obtained.
 - C. Identify the responsibility of subcontractors and suppliers who will participate in the tests and list the names of manufacturers' representatives to be present during the duration of the test.
 - D. Provide step-by-step procedures for testing control and electrical circuits to affirm that the circuit is properly identified and connected to the proper device.
 - E. Undertake performance tests in a manner that will duplicate the actual operating conditions that will be encountered.
- 1.07 TESTING SCHEDULE
 - A. Prepare a testing schedule setting forth the sequence contemplated for performing the test work. Identify the contemplated start date, duration of the test and completion of each test.
- 1.08 TEST RESULTS
 - A. Test results shall be within the tolerances set forth in the detailed specification sections of the Contract Documents. If no tolerances have been specified, test results shall conform to tolerances established by recognized industry practice.
 - B. Retesting: If any portion of the work should fail to fulfill the Contract requirements and is adjusted, altered, renewed, or replaced, tests on that portion, together with all other

portions of the work as are affected thereby, shall be repeated within reasonable time and in accordance with the specified conditions.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. The objective of the testing program is to demonstrate, to the Engineer's complete satisfaction, that the systems and equipment provided under this Contract meet the specified performance requirements.
- B. Testing program also provides a base-line operating condition for the Owner to use in a preventative maintenance program.
- C. Testing sequence consists of Pre-Operational Checkout, Functional Tests, Performance Testing and Operational Testing. These tests are required regardless of whether Factory Tests were conducted on the same piece of equipment or system.
- D. Each item of mechanical, electrical, and instrumentation equipment installed under this Contract shall be tested by the Contractor to demonstrate compliance with the performance requirements of this project.
- E. Provide labor, outside services, materials, test equipment and other items required to complete the specified testing and startup requirements. Furnish power, water chemicals, fuel, oil, grease and other materials needed to conduct the specified tests.
- F. Install temporary valves, gauges, piping and other materials required to conduct the specified tests.

3.02 PRE-OPERATIONAL CHECKOUT

- A. Pre-Operational Checkout shall be undertaken by the manufacturer's field representative.
- B. Pre-Operational Checkout includes basic checks of the equipment installation prior to starting the equipment to determine if the equipment and related components have been correctly installed and is ready for starting.
- C. Pre-Operational Checkout includes the following:
 - 1. Alignment of equipment, shafts and shaft couplings, drives, belts and pulleys.
 - 2. Filling and checking lubrication reservoirs.
 - 3. Checking shaft seals, packing and seal lubrication system.
 - 4. Manufacturer's recommendations for pre-start preparation.
 - 5. Proper motor rotation
 - 6. Circuit continuity testing, electrical testing, and instrumentation and control system testing in accordance with the requirements of Division 16.
 - 7. Demonstrate operational controls function as intended.
 - 8. Calibration and adjustment of electrical and instrumentation devices.

- D. Verify tanks, pipes, conduits, vessels and equipment are clean and free of debris that may interfere with the testing or operation of the equipment. Remove debris prior to start of testing.
- E. Following completion of the Pre-Operational Checkout, the manufacturer's field representative shall complete and sign a field certification form and submit to the Engineer.

3.03 FUNCTIONAL TESTS

- A. After successful completion of the Pre-Operational Checkout, start individual items of equipment and systems and operate under simulated operating conditions to determine as nearly as possible whether the equipment and systems meet the requirements of these specifications.
- B. Operate the equipment for a sufficient period of time to determine machine operating and characteristics, including noise, temperatures and vibration; to observe and document performance characteristics; and to permit initial adjustment of operating controls.
- C. Obtain baseline operating data on all equipment with motors greater than 10 horsepower to include amperage draw, bearing temperatures, and vibration as required. This baseline data will be collected for the Owner to enter in their preventive maintenance system.
- D. Post-Test Inspection: When Functional Tests have been completed, recheck equipment for proper alignment, unacceptably loose connections, unusual movement, or other indications of improper operating characteristics. Correct any deficiencies to the satisfaction of the Engineer.
- E. Machines or devices which exhibit unusual or unacceptable operating characteristics shall be disassembled and inspected. Repair any defects found during the course of the inspection and identify and correct the cause of such defect. Replace specific parts, or the entire equipment item, to the complete satisfaction of the Engineer at no cost to the Owner.

3.04 OPERATIONAL AND PERFORMANCE TESTS

- A. After successfully completing functional tests, conduct an operational test of each system to verify correct operation. During the operational test, conduct performance testing to verify that the system complies with the performance requirements contained in the individual equipment specifications.
- B. Owner's operating personnel will fill process units and process systems with water and other process fluids to allow the Contractor to conduct the operational tests.
- C. Upon completion of the filling operations, operate all parts of each system for a continuous, uninterrupted period of not less than 8 hours. During this period, the Contractor shall undertake performance testing and shall monitor the characteristics of each machine according to manufacturer information and specifications and report any unusual conditions to the Engineer.
- D. Undertake performance tests of mechanical, electrical, HVAC, and instrumentation equipment and systems to demonstrate and confirm compliance with the performance requirements specified in the individual equipment specifications.

- E. Should the operational testing be halted for any reason related to the facilities constructed or the equipment furnished under this Contract, the operational testing program shall be repeated until the specified continuous period has been accomplished without interruption.
- F. Following successful completion of the Operational Test, commissioning of the system may begin.

END OF SECTION

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SECTION 01 99 00
REFERENCE FORMS

The forms listed below and included in this Section are referenced from other Sections of the project manual. Contractor may submit equivalent forms for Owner's approval prior to use. If Owner does not approve substitute form, Contractor must use forms found in this Section. Owner will provide electronic files of prescribed forms to Contractor upon request.

Referenced In Section	Title of Form
01.78.23	Asset Management Data Field Form
01.78.23	Equipment Record Form - A
01.78.23	Equipment Record Form - B
09.96.00, 11.05.13, 41.12.13, 46.76.27	Extended Warranty
01.81.00	Instrumentation Data and Calibration Record Test Form
01.81.00, 41.12.13, 46.05.13, 46.33.33, 46.276.27	Manufacturer's Installation Certification
01.79.00, 41.12.13, 46.33.33	Manufacturer's Instruction Certification
11.05.13, 41.12.13, 46.33.33, 46.76.27	Motor Data Form
01.78.23	Operation and Maintenance Transmittal Form
01.78.23	Spare Parts Record
01.78.23	Spare Parts Release
01.33.00	Submittal Transmittal
41.12.13, 46.33.33, 46.76.27	Unit Responsibility Certificate

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ASSET MANAGEMENT DATA FIELD FORM:

Equipment Data Field	By Contractor	Required*	Input	Example
Equipment ID	X	1		P23DSLPCN403
Area	X	1		P23
System	X	1		DSL
Equip Type	X	1		PCN
Description	X	1		Digester #4 Recirculation Pump
Location	X	1		Digester Pump Room
Service Status	X	1		ACTV/ABDN/DLTD
Project Name	X	1		2015 Plant Expansion
Design Package	X	1		3
Size	X	1		30
Unit of Measure	X	1		HP
Manufacturer	X	1		Wemco Pumps
Model Number	X	1		Wem-omatic 30
Serial Number	X	1		234569
Subunit of		1		P23DIGTNK004
P&ID #	X	1		25.08
Elect. Drawing #	X	2		23E01
Instr. Drawing #	X	2		I-403
Other Drawing #'s		2		23P04
Normal Position		2		running
Operation Notes		2		run to recirculate Digester 4
Purchase Cost	X	1		\$15634.00
Warranty Expires	X	1		11/30/2016
Manufactured Date	X	2		05/24/2014
Purchase Date	X	2		08/18/2015
Installed Date	X	1		11/30/2015
PLC Cabinet	X	2		CCR233
Motor Control Center	X	2		MCC235
MCC Bucket	X	2		4C
Power/Lighting Panel	X	2		L-239

Equipment Data Field	By Contractor	Required*	Input	Example
Panel Circuit Breaker	X	2		17
Motor/Oper: Make/Model	X	2		Baldor / Ecotech432
Specification Number	X	1		23 40 13
Submittal Number	X	1		43A
Former Equipment ID		2		P09DSLPCN003
In Criticality Model		1		Y/N
*1 – REQUIRED for ALL Equip. *2 – REQUIRED as Applicable				

EQUIPMENT RECORD FORM A (Electrical or Motorized Mechanical Equipment):

Equip. Description:		Equip. Loc.:	
Equip. No.	Shop Dwg. No.	Date Inst.:	Cost:
Mfgr.:		Mfgr Contact	
Mfgr. Address:			Phone:
Vendor :		Vendor Contact:	
Vendor Address:			Phone:

MAINTENANCE REQUIREMENTS	D	W	M	Q	S	A	Hours
Lubricants: Recommended							
Alternative:							
Misc. Notes:							

Recommended Spare Parts				Electrical Nameplate Data			
Part No.	Qty	Part Name	Cost	Equip			
				Make			
				Serial No.		Id. No.	
				Model No.		Frame No.	
				HP	V	Amp	Hz
				pH	RPM	SF	Duty
				Code	Ins. Cl.	DES	Type
				NEMA DES	C Amb.	Temp Rise	Rating
				Misc.			

Recommended Spare Parts				Mechanical Nameplate Data			
Part No.	Qty	Part Name	Cost	Equip			
				Make			
				Serial No.		Id. No.	
				Model No.		Frame No.	
				HP	V	Amp	Hz
				pH	RPM	SF	Duty
				Code	Ins. Cl.	DES	Type
				NEMA DES	C Amb.	Temp Rise	Rating
				Misc.			

EQUIPMENT RECORD FORM B (Electrical or Non-Motorized Mechanical Equipment):

Equip. Description:		Equip. Loc.:	
Equip. No.	Shop Dwg. No.	Date Inst.:	Cost:
Mfgr.:		Mfgr Contact	
Mfgr. Address:			Phone:
Vendor :		Vendor Contact:	
Vendor Address:			Phone:

[illegible]

EXTENDED WARRANTY FORM
(For Equipment, Material, Process)

Extended Warranty For: Product Name

Specification Section No. _____

Product Manufacturer _____

Project: _____

Location: _____

We hereby guarantee the Product Name that we have constructed for a period of # of Years (#) year(s), as specified in the Section noted above, from Date, the date of acceptance of the work/substantial completion and the assumption of occupancy and beneficial use by the Name of Owner.

The following are excluded from the provisions of this warranty:

We agree that if any of the equipment, material, or process designated for Product Name should fail due to any reason other than improper maintenance or improper operation, or should any portion of the work fail to fulfill any of the requirements of the Specifications, we will, within ten days after written notice of such defects, commence to repair or replace the same together with any other work which may be damaged or displaced in so doing.

In the event of our failure to comply with the above mentioned conditions within a reasonable time after being notified, or should exigent circumstances require repairs or replacements to be made before we can be notified or respond to notification, we do hereby authorize the Name of Owner to proceed to have the defect repaired and made good at our expense, and we will pay the cost therefor upon demand.

The warranty provided herein shall not be in lieu of, but shall be in addition to any warranties or other obligations otherwise imposed by the Contract Documents and by law.

Manufacturer: _____	Contractor: _____
Signed: _____	Signed: _____
Title: _____	Title: _____
Date: _____	Date: _____
Phone: _____	Phone: _____
E-mail: _____	E-mail: _____

INSTRUMENTATION DATA AND CALIBRATION RECORD TEST FORM

Component Description _____

Component Tag Name _____

Manufacturer _____ Location _____
Name _____ Site _____
Model _____
Serial # _____ Equip _____

	Range	Unit	General Notes		
Indicator Range			1) Attach Calibration Curves for dp Flowmeters		
Input Range			2) Include mounting elevations for level Instruments		
Output Range			3) All entries within solid box to be typed in prior to start of test		
Designed Calibration			Measured Calibration		
Input Signal	Output	Eng. Value	Input	Output	Comments

Notes:

Tested by _____ (print name) Witnessed by _____ (print name)

Signature _____ Signature _____
Date _____ Date _____

MANUFACTURER'S INSTALLATION CERTIFICATION FORM

Contract No: _____ Specification Section: _____

Equipment Name _____

Contractor: _____

Manufacturer of Equipment Item: _____

The undersigned manufacturer of the equipment item described above hereby certifies that he has checked the installation of the equipment and that the equipment, as specified in the project manual, has been provided in accordance with the manufacturer's recommendations and that the trial operation of the equipment item has been satisfactory.

Comments:

Date

Manufacturer

Signature of
Authorized Representative

Date

Contractor

Signature of
Authorized Representative

MANUFACTURER'S INSTRUCTION CERTIFICATION FORM

Contract No: _____ Specification Section: _____

Equipment Name: _____

Contractor: _____

Manufacturer of Equipment Item: _____

The undersigned manufacturer certifies that a service engineer has instructed the owner's staff in the proper maintenance and operation of the equipment designated herein.

Operations Check List (check appropriate spaces)

Start-up procedure reviewed ☐

Shutdown procedure reviewed ☐

Normal operation procedure reviewed ☐

Others: ☐

_____ ☐

_____ ☐

Maintenance Check List (check appropriate spaces)

Described normal oil changes (frequency) ☐

Described special tools required ☐

Described normal items to be reviewed for wear ☐

Described preventive maintenance instructions ☐

Described greasing frequency ☐

Others ☐

_____ ☐

_____ ☐

Manufacturer: _____

Date

Signature of Authorized Representative

Date

Signature of Owner's Representative

Date

Signature of Contractor's Representative

MOTOR DATA FORM

Equipment Name: _____ Equipment Number: _____

Site Location: _____

Nameplate Markings

Mfr _____ Mfr Model _____ Frame _____ HP _____

Volts _____ Phase _____ RPM _____ Service Factor _____

FLA _____ LRA _____ Freq _____ Amb temp rating _____ degrees C

Time rating _____ Design letter _____

(NEMA MG1-10.35)

(NEMA MG-1.16)

KVA code letter _____ Insulation class _____

The following information is required for explosionproof motors only:

A. Approved by UL for installation in Class _____, Div _____

B. UL frame temperature code _____, Group _____ Atmosphere

(NEC Tables 500-2 and 500-2(b))

The following information is required for high efficiency motors only:

A. Guaranteed minimum efficiency at full load or NEMA efficiency index

(NEMA MG1-12.53b)

B. Nameplate or nominal efficiency _____

Data Not Necessarily Marked on Nameplate

Type of enclosure _____ Enclosure material _____

Temp rise _____ degrees C (NEMA MG1-12.41,42)

Space heater included? _____ Yes _____ No, if Yes _____ watts _____ volts

Type of motor winding overtemperature protection, if specified:

Use the space below to provide additional information on other motor modifications, if specified:

OPERATING AND MAINTENANCE INFORMATION TRANSMITTAL

Submittal Description: _____

Submittal No.	# Copies:
☐ 1st Submission	☐ Re-Submittal
Spec Section	

Owner:	Routing	Date Sent	Date Received
	Contractor/CM		
Project:	CM/Design Consultant		
	Design Consultant/CM		
Contractor:	CM/Contractor		

Supplier Name:	Supplier Review		Design Consultant Review	
Checklist	Satisfactory	N/A	Accept	Deficient
1. Table of Contents	☐	☐	☐	☐
2. Equipment Record Forms	☐	☐	☐	☐
3. Supplier/Vendor Contact Information	☐	☐	☐	☐
4. Safety Precautions	☐	☐	☐	☐
5. Operator Pre-Start	☐	☐	☐	☐
6. Start-up, Shutdown/Post-Shutdown Procedures	☐	☐	☐	☐
7. Normal Operations	☐	☐	☐	☐
8. Emergency Operations	☐	☐	☐	☐
9. Operator Service Requirements	☐	☐	☐	☐
10. Environmental Conditions	☐	☐	☐	☐
11. Lubrication Data	☐	☐	☐	☐
12. Preventative Maintenance Plan/Schedule	☐	☐	☐	☐
13. Troubleshooting Guide/Diagnostic Techniques	☐	☐	☐	☐
14. Wiring Diagrams and Control Diagrams	☐	☐	☐	☐
15. Maintenance and Repair Procedures	☐	☐	☐	☐
16. Removal and Replacement Procedures	☐	☐	☐	☐
17. Spare Parts and Supply List	☐	☐	☐	☐
18. Corrective Maintenance Man-hours	☐	☐	☐	☐
19. Parts Identification	☐	☐	☐	☐
20. Warranty Information	☐	☐	☐	☐
21. Personnel Training Requirements	☐	☐	☐	☐
22. Testing Equipment and Special Tool Information	☐	☐	☐	☐

Remarks:	
----------	--

(Contractor's Signature)

(Supplier's Signature)

SPARE PARTS RECORD FORM

PROJECT			
DESIGN PACKAGE			
SPECIFICATION SECTION			
SPECIFICATION TITLE			
MFGR		MFGR CONTACT	
MFGR ADDRESS		MFGR PHONE	
VENDOR		VENDOR CONTACT	
VENDOR ADDRESS		VENDOR PHONE	

EQUIPMENT NUMBER(S):	EQUIPMENT NAME(S):

SPARE PARTS						
PART NO.	PART NAME	MFG	COST	LONG LEAD TIME*	QUANTITY	
					SPECIFIED	REC. BY MFG

*Long lead time = parts requiring more than 4 weeks from time of order to delivery.

SPARE PARTS RELEASE FORM

Design Package: _____

Project No: _____

Place of Delivery: _____

Date: _____

Pallet Number	Container Number	Spec Section	Equipment Number	Spare Part Description	Price

Signature of Contractor

Date

Signature of Owner

Date

cc: Maintenance Supervisor
Operations Supervisor

SUBMITTAL TRANSMITTAL

Submittal Description _____

Priority Level: ☐ Low ☐ Medium ☐ High ☐ On Critical Path

Submittal No.	
☐ 1st Submission	☐ Re-Submittal
Spec Section	
Dwg/Detail No.	

Owner:	Routing	Date Sent	Date Received
Project Name:	Contractor/CM		
	CM/Design Consultant		
Contractor:	Design Consultant/CM		
	CM/Contractor		

We are sending you: ☐ Attached ☐ Under separate cover via _____
☐ Submittals for review and comment
☐ Product Data for information only _____

No. Copies	Description	Manufacturer	Reviewer Action	Reviewer Initials

The Action Designated Above is in Accordance with the Following Legend: A – No Exceptions Taken B – Make Corrections Noted C – Amend and Resubmit D – Rejected E – Review not Required	CONTRACTOR: Must certify one of the following statements pertaining to the transmittal or submittal sent for review: ☐ As the General Contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements, including coordination with all related work specified (no exceptions) ☐ As the General Contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements specified except for the attached deviations.
--	--

Comments:

--

Certified by: _____
(Contractor's Signature)

SYSTEM OUTAGE REQUEST FORM

System to be Shutdown: _____

SOR No.: _____

Date of Shutdown: _____ Beginning at: _____ am/pm

Duration of Shutdown: _____ Critical Path Activity? ☐ yes ☐ no

Owner:		Routing	Date Sent	Date Received
Project:		Contractor/CM		
Contractor:		CM/Owner-Operations		
Regulatory Agency Notification Required? ☐ yes ☐ no Is a Dry Run Required? ☐ yes ☐ no Combustible/Hazardous Gases Present? ☐ yes ☐ no Confined Space Entry? ☐ yes ☐ no				
Describe work to be performed including detailed sequence of events, safety plan, protection of existing facilities, equipment to be used and contingency plan. Use additional sheets as necessary.				
Will you require assistance from Owner Operations? ☐ yes ☐ no Note: <i>Existing valves and controls shall be operated by Owner staff only</i>				
Outage Contact Information	Name of Person on Call/Duty	Home Phone	Cell Phone	
Contractor				
Construction Manager				
Owner Operations				
Design Consultant				
Additional Contractor Comments:		CM / Owner / Design Consultant Review Action ☐ SOR Acceptable with comments noted on attached. ☐ SOR Not Acceptable with reasons noted on attached. Re-Submittal is required.		
Certified by: _____ (Contractor's Signature)		(Construction Manager's Signature) _____ Date _____		

Name of Owner

**CERTIFICATE OF UNIT RESPONSIBILITY
For Specification Section**

Section Number and Title

In accordance with the contract documents, the undersigned manufacturer accepts unit responsibility for all components of equipment furnished under specification Section Section #. We hereby certify that these components are compatible and comprise a functional unit suitable for the specified performance and design requirements.

Name of Corporation

Street Address

City, State and Zip Code

Notary Public

By: _____
Duly Authorized Official

Commission Expiration Date

Name

Title

Seal:

Date: _____

SECTION 05 50 01

ANCHOR BOLTS AND ANCHORING DEVICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Anchor bolts, concrete anchors, adhesive anchors, and other anchoring devices.

1.02 REFERENCED SECTIONS

- A. The following Section is referenced in this Section
 - 1. Section 01 33 00 – Submittals

1.03 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: Manufacturer's data for nuts, bolts, concrete anchors, chemical anchors and other fasteners.
- C. Catalog data and ICC reports for each type of anchor bolt.

1.04 QUALITY ASSURANCE

- A. For applications that require special inspection in accordance with building codes, coordinate the progress of the Work with the required inspection activities.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Unless otherwise specified or indicated on the Drawings, materials of construction for anchoring devices shall conform to the following:
 - 1. Anchor bolts and other anchoring devices, nuts and washers installed indoors: Type 304 stainless steel.
 - 2. Anchor bolts and other anchoring devices, nuts and washers installed outdoors or in locations exposed to wastewater: Type 316 stainless steel.
 - a. Locations exposed to wastewater includes:
 - 1) Below tops of walls of water-containing structures.
 - 2) Underside of roof, slab or walkways of enclosed water-containing structures.
 - 3) Dry side of walls on water-containing structures.

2.02 CAST-IN-PLACE ANCHOR BOLTS

- A. Locations for use of cast-in-place anchor bolts:
 - 1. In locations indicated on the Drawings.
 - 2. To anchor engine-driven equipment and equipment with motors 3 horsepower and larger.

B. Cast-in-Place Anchor Bolts

1. Material: Stainless steel conforming to ASTM A320.
2. Minimum Length of Bolt: As indicated on the Drawings. When not indicated, provide bolt length such that the length of the embedded anchor is at least 10 bolt diameters.
3. Embedded end of anchor bolts: Standard hex headed (hook or J bolts not allowed).

2.03 CONCRETE ANCHORS

- A. Application: Not allowed in walls or floor slabs of water containing structures.
- B. Concrete Anchors: Drilled in place wedge-type anchors with threaded stud body, stainless steel expansion clip, nut and washer.
- C. Materials: Type 304 or Type 316 stainless steel, depending upon installed location.
- D. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC193.
- E. Manufacturers: One of the following or equal:
 1. Hilti Kwik Bolt 3.
 2. ITW Redhead, Trubolt Wedge Anchor.
 3. Dewalt Fasteners, Power-Stud SD4 or SD6.
 4. Simpson Strong Tie, Strong-Bolt 2 Wedge Anchors.

2.04 STUDS

- A. Material: Conforming to ASTM A108 with 50,000 pounds per square inch minimum yield strength, and 60,000 pounds per square inch minimum tensile strength.
- B. Manufacturers: One of the following or equal:
 1. Nelson Stud Welding Company, S3L Shear Connectors or H4L Concrete Anchors.
 2. Stud Welding Products, Headed Concrete Anchors and Shear Connectors or Concrete Anchors.

2.05 ADHESIVE ANCHORS

- A. Applications: Use for bonding threaded rods and concrete reinforcing bars to hardened concrete and grouted cement masonry. Do not use in overhead applications, in chlorine gas environments, or where anchor may be exposed to machine oil or diesel oil.
- B. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC58.
- C. Materials
 1. Epoxy Adhesive: Two component, injectable epoxy adhesive.
 2. Concrete Reinforcing Bars: Grade 60.
 3. Threaded Rods: Type 304 stainless steel all-thread rod conforming to ASTM F593.

- D. Manufacturers: One of the following or equal:
 - 1. Hilti HVA Adhesive Anchor System.
 - 2. ITW Redhead G6+ Adhesive Anchoring System.
 - 3. Dewalt Fasteners PE1000+ Epoxy Anchoring System.
 - 4. Simpson Strong Tie, SET-XP Epoxy Adhesive.

PART 3 - EXECUTION

3.01 GENERAL ANCHORING REQUIREMENTS

- A. Use equipment shop drawings, anchorage layout drawings, and anchor bolt layout templates to accurately position anchor bolts.
- B. Install anchor bolts, concrete anchors and other anchoring devices with at least 2 threads projecting beyond the nut, but no more than 1/2-inch projecting beyond the nut.
- C. Prior to installing nuts, coat threads of stainless steel bolts with material to prevent galling of threads.
 - 1. Manufacturers: One of the following or equal:
 - a. Never Seez Compound Corporation, Never-Seez.
 - b. Oil Research, Inc., WLR No. 111.
- D. Tighten nuts on anchor bolts, concrete anchors and other anchoring devices to the "snug-tight" condition, defined as tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary wrench.

3.02 CAST-IN-PLACE ANCHOR BOLTS

- A. Do not use expansion type concrete anchors or adhesive anchors as substitution for cast-in-place anchor bolts.
- B. Accurately place anchor bolts to be embedded in concrete within the formwork and perpendicular to surface from which they will project. Secure in correct position while concrete is placed.
- C. Do not allow anchor bolts to touch reinforcing steel in water containing structures where the anchor bolts may come into contact with water. Where anchor bolts are within 1/4 inch of reinforcing steel, isolate with a minimum of 4 wraps of 10 mil polyvinyl chloride tape in area adjacent to reinforcing steel.
- D. In anchoring machinery bases subject to heavy vibration, use 2 nuts, with 1 serving as a locknut.
- E. Where bolts are indicated on the Drawings for future use, first coat thoroughly with non-oxidizing wax, then turn nuts down full depth of thread and neatly wrap exposed thread with waterproof polyvinyl tape.
- F. Where indicated on the Drawings, set anchor bolts in metal sleeves having inside diameter approximately 2 inches greater than the bolt diameter and a minimum of 10 bolt diameters deep. Fill sleeves with grout when equipment is grouted in place.

3.03 CONCRETE ANCHORS AND ADHESIVE ANCHORS

- A. Cast-in-place anchor bolts may be used in place of concrete anchors and adhesive anchors at Contractor's option.
- B. Installation
1. Drill holes using concrete drill bits and impact type drill motors. Hole diameter shall be in accordance with the manufacturer's recommendations.
 2. Clean drilled hole in accordance with manufacturer's recommendations using a wire brush and compressed air to dislodge and remove drilling dust.
 3. Accurately locate concrete anchors and set anchors with axis perpendicular to surfaces from which they will project.
 4. Do not disturb adhesive anchors until cure time has elapsed.
 5. Unless otherwise indicated on the Drawings or as required by structural calculations prepared by the equipment supplier, comply with minimum embedment lengths identified in the following table.

Minimum Embedment Lengths for Concrete and Adhesive Anchors

Diameter of Anchor or Bar, inches	Embedment Length for Concrete Anchors, inches	Embedment Length for Adhesive Anchors or Reinforcing Bars
1/4	1-3/4	As indicated on the Drawings
3/8	1-7/8	
1/2	2-1/4	
5/8	2-3/4	
3/4	3-1/4	
(1) Provide longer embedment where otherwise indicated		

END OF SECTION

SECTION 09 96 00

HIGH PERFORMANCE COATINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Materials, surface preparation, application, curing, and inspection for industrial, high-performance coatings on interior and exterior surfaces.
- B. Furnish all labor, materials, tools and equipment required to perform surface preparation, coating work, and inspection as specified. Perform all subsidiary and incidental work necessary to complete the work in conformance with the project requirements, to accomplish the approved end result of a totally protected and usable structure, including all attachments, accessories and appurtenances.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 66 00 – Materials and Equipment
 - 3. Section 01 99 00 – Reference Forms

1.03 DEFINITIONS

- A. Abrasive: Material used for blast-cleaning, such as grit.
- B. Abrasive Blast Cleaning: Cleaning/surface preparation by abrasive propelled at high speed.
- C. Anchor Pattern: Profile or texture of prepared surface(s).
- D. Bug Holes: Small cavities, usually not exceeding 15 mm in diameter, resulting from entrapment of air bubbles in the surface of formed concrete during placement and compaction.
- E. Coating/Lining Thickness: The total thickness of primer, intermediate and/or finish coats.
- F. Dewpoint: Temperature of a given air/water vapor mixture at which condensation starts.
- G. Dry Film Thickness (DFT): Depth of cured film, usually expressed in mils (0.001-inch). Use this definition as opposed to existing definition.
- H. Drying Time: Time interval between application and curing of material.
- I. Dry to Recoat: Time interval between application of material and ability to receive next coat.
- J. Dry to Touch: Time interval between application of material and ability to touch lightly without damage.
- K. Feather Edging: Reducing the thickness of the edge of paint.

- L. Feathering: Operation of tapering off the edge of a point with a comparatively dry brush.
- M. Field Coat: The application or the completion of application of the coating system after installation of the surface at the site of the work.
- N. Hold Point: A defined point, specified in this Section 09 96 00, at which work shall be halted for inspection.
- O. Holiday: A discontinuity, skip, or void in coating or coating system film that exposes the underlying substrate.
- P. Honeycomb: Segregated condition of hardened concrete due to non-consolidation.
- Q. Incompatibility: Inability of a coating to perform well over another coating because of bleeding, poor bonding, or lifting of old coating; inability of a coating to perform well on a substrate.
- R. Laitance: A layer of weak, non-durable concrete containing cement fine that is brought to the surface through bleed water as a result of concrete finishing/overfinishing.
- S. Mil: 0.001-inch.
- T. Overspray: Dry spray, particularly such paint that failed to strike the intended surface.
- U. Pinhole: A small diameter discontinuity in a coating or coating system film that is typically created by outgassing of air from a void in a concrete substrate resulting in exposure of the substrate or a void between coats.
- V. Pot Life: Time interval after mixing of components during which the coating can be satisfactorily applied.
- W. Resurfacer/Resurfacing Material: A layer of cementitious and/or resin-sed material used to fill or otherwise restore surface continuity to worn or damaged concrete surfaces.
- X. Shelf Life: Maximum storage time for which a material may be stored without losing its usefulness.
- Y. Shop Coat: One or more coats applied in a shop or plant prior to shipment to the site of the work, where the field or finishing coat is applied.
- Z. Spreading Rate: Surface area covered by a unit volume of paint at a specific film thickness.
- AA. Stripe Coat: (SSPC Guide 11) A separate coat of paint applied to all weld seams, pits, nuts/bolts/washers, and edges by brush. This coat shall not be applied until any previous coat(s) have cured and, once applied, shall be allowed to cure prior to the application of the subsequent coat(s).
- BB. Surface Saturated Dry (SSD): Refers to concrete surface condition where the surface is saturated (damp) without the presence of standing water.
- CC. Tie Coat: An intermediate coat used to bond different types of coatings. Coatings used to improve the adhesion of a succeeding coat.
- DD. Touch-Up Painting: The application of paint on areas of painted surfaces to repair marks, scratches, and areas where the coating has deteriorated to restore the coating film to an unbroken condition.

- EE. Volatile Organic Compound (VOC) Content: The portion of the coating that is a compound of carbon, is photo chemically reactive, and evaporates during drying or curing, expressed in grams per liter (g/l) or pounds per gallon (lb/gal).
- FF. Immersion: Refers to a service condition in which the substrate is below the waterline or submerged in water or wastewater at least intermittently if not constantly.
- GG. Weld Spatter: (NACE SPO-178) Beads of metal scattered near seam during welding.
- HH. Wet Film Thickness (WFT): The primer or coating film's thickness immediately following application. Wet film thickness is measured in mils or thousandths of an inch (0.001-inch) and is abbreviated WFT.

1.04 REFERENCES

- A. ANSI – American National Standards Institute
- B. ASTM – American Society for Testing and Materials
- C. CSA – Canadian Standards Association
- D. IAPMO – International Association of Plumbing and Mechanical Officials
- E. SSPC – The Society for Protective Coatings
- F. NACE International – National Association of Corrosion Engineers International
- G. NSF International – National Sanitation Foundation International
- H. UL – Underwriters Laboratories
- I. WQA – Water Quality Association

1.05 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Finish Schedule
 - 1. Submit a complete Finish Schedule that includes the surfaces in the Finish Schedule herein and any additional surfaces to be coated by the products submitted under this Section 09 96 00. Indicate the specific products and manufacturer for each item (equipment, substrate, or structure) to be coated.
 - 2. Submit a color card or fan deck for each manufacturer and coating product submitted. Items in the complete Finish Schedule shall be confirmed with Owner-approved colors for each location prior to ordering materials.
- C. Product Technical Data
 - 1. Product Data Sheets: Submit coating manufacturer's technical data on products and recommended use. Include the brand name and series number of all coatings to be used. Submit product data sheets for all coating systems that include the following information:
 - a. VOC data.
 - b. Storage requirements.
 - c. Primer type, where required.

- d. Maximum dry and wet mil thickness per coat.
 - e. Minimum and maximum curing time between coats and final cure times, including atmospheric conditions for each.
 - f. Curing time before submergence in liquid.
 - g. Thinners/solvents for reduction and cleaning.
 - h. Ventilation requirements.
 - i. Minimum and maximum atmospheric and substrate application conditions.
 - j. Allowable application methods.
 - k. Maximum allowable moisture content (concrete substrates).
 - l. Maximum shelf life.
2. Material Safety Data Sheets (MSDS): Submit coating manufacturer's Material Safety Data Sheets (MSDS) for products to be used on the project, including solvents, additives, cleaners, and thinners.
 3. Surface Preparation Criteria: Submit coating manufacturer's surface preparation criteria, including recommended surface profile range after abrasive blasting.
 4. Application Instructions: Submit Coating manufacturer's application instructions and equipment recommendation.

D. Certifications

1. VOC Content: Submit coating manufacturer's certification indicating that the submitted coatings meet regulations for allowable VOC content in the place of application and use intended.
2. NSF 61 Certification: Submit NSF 61 certification or listing for products applied to surfaces in contact with process (potable or to be treated to potable) water.
3. Compatibility Confirmation: Submit written confirmation by the shop and field applied coating manufacturers indicating that the compatibility between the shop and field applied coatings have been checked and approved by those manufacturers.

E. Coating Plan/Program

1. Cleaning and Abrasive Blasting Equipment: Submit abrasive blast cleaning and application equipment list and complete procedures for its use.
2. Coating System Treatment and Termination: Submit detailed, written instructions and/or graphic details for coating system treatment and coating system terminations for items to be coated in the project.
3. Overspray and Fugitive Dust Prevention: Submit contractor's written program for over spray prevention.
4. Recoating Information and Schedule: Submit information that defines the end date for field coating application for all equipment, machinery, and piping to ensure that the maximum recoat time for the shop applied primers will not be exceeded when field applied coatings are installed.

F. References and Qualifications

1. Manufacturer Project References: Submit a minimum of five project references, including current contact name, address, and telephone number where proposed coating products have been successfully used in similar coating applications within the past 5 years.
2. Applicator Project References: Submit a minimum of five project references, including current contact name, address, and telephone number where the Coatings Applicator has successfully performed similar coating work within the past 5 years.
3. Applicator Quality Assurance: Submit a letter from the selected and approved coating manufacturers for the project that verifies that the applicator meets the qualifications and quality assurance requirements in this Section (09 96 00).
4. Inspector Qualifications: Submit Qualifications for Quality Control personnel to be provided on site by the Contractor including, but not limited to, the inspector's NACE and SSPC Certification numbers for the certifications as requested in this Section (09 96 00).

1.06 QUALITY ASSURANCE

A. Regulatory Requirements

1. All work, materials, procedures, and practices under this Section (09 96 00) shall conform to the requirements of the applicable Federal, State, County, and local regulations and ordinances. The Contractor shall be responsible for securing any and all licenses, certificates, and permits required for the work at no additional cost to the Owner.
2. Prime and finish coat painting done at the project site or in locations other than the project site shall be in accordance with the air quality regulations in effect at the place the coating is applied.
3. All debris (liquid or solid) generated from surface preparation or coating activities shall be tested and disposed offsite in accordance with applicable Federal, State, County, and local regulations and ordinances. The Contractor shall be responsible for all required testing, monitoring, reporting, licenses, permits, and fees at no additional cost to the Owner.

B. Unit Responsibility

1. Assign unit responsibility for the materials, surface preparation, and coatings application to the Coatings Application Subcontractor .
2. Provide a certificate of Unit Responsibility. See Section 01 99 90.

C. Materials

1. Contaminated, outdated, diluted materials, and/or materials from previously opened containers shall not be used.
2. Each coating system shall have only one product used for the finish coat to ensure consistency in appearance throughout the project.

3. Delivery of coating system materials shall be in original, unopened containers with seals unbroken and labels intact. Labels shall identify type of material, color, and batch number. No material shall exceed six months from the original batch manufacturing date (No exceptions).
 4. For repairs, the Contractor shall provide the same products, or products recommended by the coating manufacturer, as used for the original coating.
- D. Qualifications
1. Coatings Manufacturer Requirements
 - a. Minimum of ten (10) years of successful experience manufacturing protective coatings. Submit list of references to demonstrate successful performance on comparable projects.
 2. Coatings Applicator Requirements
 - a. Minimum of five (5) years practical experience and successful history in the application of similar products on comparable projects. Submit list of references.
- E. Pre-Painting Conference
1. Schedule pre-painting conference with the Owner.
 2. Do not proceed without holding a pre-painting conference with the Owner, Contractor, Inspector, Coating Applicator and Manufacturer.
 3. Topics for discussion include:
 - a. Site conditions
 - b. Coating materials and manufacturer's application recommendations.
 - c. Surface preparation prior to abrasive blast cleaning.
 - d. Specification compliance of blast abrasives and surface profile requirements.
 - e. Schedule of field surface preparation and coating application, and order of the work.
 - f. List of equipment and procedures for cleaning, blasting, coating application, ventilation and dehumidification (if required).
 - g. Safety programs and the enforcement to be used during the course of the work.
 - h. Weather limitations for acceptable work.
 - i. Inspection facilities and equipment to be provided.
 - j. Hold points and inspector's authority.
 - k. Establish non-conformance procedures, and chain of command and who signs off on completion of bringing the job back into compliance.
 - l. Procedures for over-spray prevention.

F. Coatings Applicator Personnel

1. Provide a supervisor at the work site during cleaning, surface preparation, and coating operations.
2. Provide skilled personnel qualified to perform work to industry standards of practice and safety, maintain continuity of personnel, and coordinate any transfer of personnel with the Owner.

G. Quality Control Requirements

1. The Contractor is responsible for ensuring that the surface preparation and coating activities meet the requirements of this specification. Observations by the Engineer, or a representative of the coating manufacturer, will not relieve or limit the Contractor's responsibilities.
2. Coatings application shall conform to requirements of this specification and the referenced standards. Changes in the coating system installation requirements will be allowed only with the written authorization of the Engineer before work commences.
3. The Contractor shall conduct the work and maintain appropriate and measurable quality control activities to ensure that the coating systems are installed as specified. Coating system work that does not conform to the Specifications or is otherwise not acceptable shall be corrected in accordance with the coating manufacturer's written procedures.
 - a. Measure all dry film thicknesses. Readings shall be conducted as defined in SSPC-PA2.
 - b. The Owner may, but is not required to, also measure coating thickness, at random locations, after each coat. SSPC –PA 2 (Level 1) is only to be used for the calibration of dry film thickness gauges. This is a minimum maximum dry film thickness specification. Dry film thickness readings will not be averaged. All inspection equipment shall be supplied by the Contractor. All equipment shall have current calibration certificates. The Owner reserves the right to use their own equipment at any time.
4. The Contractor shall prepare and submit coating work daily reports for each day while on site. The coating work daily reports shall be submitted to the Engineer no later than 1:00 p.m. the following workday. The coating work daily reports shall include the following:
 - a. Number of coating applicator employees on site.
 - b. Start and finish time of work shift.
 - c. Climatic conditions at 4-hour intervals (i.e., partly cloudy, air temperature 78°F, relative humidity 63%, dew point 68°F, and WNW wind @ 4 mph).
 - d. Major equipment on site regardless of utilization (i.e., trailers, air compressors, generators, spray pumps, scaffolding, aerial lifts, pressure washers, and sandblast pots).
 - e. Inventory of coatings, solvents and abrasive media stored on site including information relative to deliveries received each day.

- f. Summary of work performed to include:
 - 1) Substrates/structures prepared (size, quantity, and location).
 - 2) Surface preparation methods including materials consumed and equipment utilized.
 - 3) Substrates/structures coated (size, quantity, and location).
 - 4) Mixing method and time mixed (coating materials).
 - 5) Induction time, pot life, and application start time.
 - 6) Coating application methods including equipment utilized.
 - 7) Application finish time.
 - 8) Coating materials consumed [sequencing, product name, batch number(s) and manufacture date].
 - 9) Problems encountered (i.e., equipment malfunctions or disruption/interference by other trades).
 - 10) Accidents or near misses.
 - 11) Quality control testing results.

H. On-site Inspection

- 1. The Contractor shall identify the points of access for inspection. The Contractor shall provide ventilation, ingress and egress, and other means necessary for the Owners' personnel to safely access the work areas.
- 2. The specified quality control tasks shall be performed by a NACE-certified inspector hired and paid for by the Owner.
- 3. Acceptance criteria for each Quality Control test shall be as indicated on the manufacturer's published data or in this specification, whichever is more stringent.

1.07 WARNINGS

- A. Application of paint, epoxy, and protective coating materials may be hazardous. Take all necessary precautions to ensure the safety of workers and property.
- B. Part of this work requires abrasive blasting. This may require the use of special equipment. Become familiar with the existing site conditions and take all steps necessary to protect adjacent facilities and personnel, at no additional cost to the Owner. Abrasive blasting and painting is called for in, on, or around mechanical equipment, which may be damaged by grit, dust, or painting overspray. Mask, wrap, enclose, and provide all protection required to safeguard this equipment at no additional cost to the Owner.
- C. Perform abrasive blasting activities in a manner that will not cause nuisance.

1.08 EXTRA MATERIALS

- A. Supply 1 gallon of each color, type, and surface texture. Store where directed.
- B. Label each container with color, type, texture, and room locations, in addition to manufacturer's label.

1.09 WARRANTY

- A. Provide material and workmanship warranty for coatings of 18 months from date of final acceptance by the Owner
- B. Complete the Extended Warranty Form in Section 01 99 00
- C. See also Paragraph 3.10.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Products identified for each coating system are the product names from specific manufacturers. Coatings products from other manufacturers and of equal or higher quality and performance may also be acceptable.
 - 1. Requests for Substitution of Alternative Coatings Products:
 - a. Include the full name of each product, descriptive literature, test data, data on past performance, manufacturer's instruction for use, generic type, and its nonvolatile content by volume.
 - b. Demonstrate product and performance is equivalent to the specified materials and complete systems.
 - c. Demonstrate that the coatings manufacturer has local qualified representation which will provide onsite technical support to resolve field problems with the manufacturer's products, materials or application for the duration of the project.
- B. Requests for substitution of alternative coating products that decreases the specified dry-film thickness or the number of coats to be applied, or which changes the generic type of coating specified, will not be considered.

2.02 ABRASIVES FOR BLAST CLEANING

- A. Use only new materials that are clean and free of contaminants.
- B. Materials must be certified by the California Air Resources Board (CARB) for use in dry, open air abrasive blasting.
- C. The Contractor shall use abrasive grit for field blast cleaning conforming to the following:
 - 1. Produce a sharp angular surface profile of 1.5 to 2.5 mils
 - 2. New, clean and free of contaminants (SSPC AB 1), and containing no hazardous materials.
- D. Comply with all applicable requirements of Cal/OSHA and the Bay Area Air Quality Management District. Abrasives shall be certified by California Air Resources Board, Executive Order G-565.
- E. Purchase only from firms which can accept spent abrasives, then process spent abrasives for recycle or proper disposal.

2.03 COATING SYSTEMS

A. System No. 1 – Zinc-Epoxy-Polyurethane System

1. Surface: Metal.
2. Service: Interior; exterior; exposed to direct sunlight; not immersed.
3. Surface Preparation
 - a. Shop-Primed Metal
 - 1) Clean shop-primed surfaces in accordance with SSPC SP-2 (Hand Tool Cleaning).
 - 2) Clean damaged shop-coated areas in accordance with SSPC SP-3 (Power Tool Cleaning) and recoat with specified primer.
 - 3) For factory-coated or shop-primed pumps, tanks, and other equipment, delete zinc-rich primer and use compatible primer as recommended by the coating manufacturer. All repair areas shall be abraded and de-glossed and feathered into a smooth transition.
 - b. Bare Metal
 - 1) Prepare surface in accordance with SSPC SP-6 (Commercial Blast Cleaning) to 1.5 to 2.5 mil (Thin film systems) surface profile.
 - 2) For ductile iron pipe, prepare surfaces in accordance with NAPF 500-03, NAPF 500-03-04, and NAPF 50.
 - 3) Clean ferrous metal with bleeding in accordance with SSPC SP-11 (Power Tool Cleaning to Bare Metal).
 - 4) Spot blast areas of rust penetration to SSPC SP-10 (Near White Blast) and spot prime with specified primer.
 - c. Galvanized Metal
 - 1) Clean damaged galvanized steel areas with exposed ferrous metal and/or rust in accordance with SSPC SP-5 (White Metal Blast Cleaning) or SSPC SP-11 (Power Tool Cleaned to Bare Metal) to achieve uniform 1.0 to 1.5 mil profile; spot prime with specified primer.
 - 2) Prepare galvanized, non-ferrous metal in accordance with SSPC SP-16 to impart uniform 1.0 to 1.5 mil profile.
 - 3) For galvanized steel, delete zinc primer.
4. Primer
 - a. Field apply one coat of zinc-rich epoxy primer, or polyurethane primer where zinc-rich primer is to be omitted, compatible with urethane finish; comply with written instructions of coating manufacturer.
 - b. Thickness: 3.0 to 4.0 dry mils.
 - c. Products: Sherwin Williams, Zinc Clad 4100; Carboline, 859; or equal.

5. Intermediate
 - a. Field apply one coat of intermediate or primer epoxy.
 - b. Thickness: 5.0 to 6.0 dry mils.
 - c. Product: Sherwin Williams, Macropoxy 646 FC; Carboline, Carboguard 890; or equal.
 6. Finish
 - a. Field apply one coat of polyurethane finish.
 - b. Thickness: 2.0 to 3.0 dry mils.
 - c. Product: Sherwin Williams, Hi Solids Polyurethane 250; Carbothane 134VOC; or equal.
- B. System No. 2 – NSF Epoxy
1. Surface: Metal.
 2. Service: Interior of tanks and other metal components in contact with water.
 3. Surface Preparation
 - a. Shop-Primed Metal
 - 1) Clean shop-primed surfaces in accordance with SSPC SP-2 (Hand Tool Cleaning) or SSPC SP-3 (Power Tool Cleaning).
 - 2) Clean damaged shop-coated areas in accordance with SSPC SP-5 (White Metal Blast Cleaning) and spot prime with specified primer. Cleaning shall produce a surface profile of 2.0 to 2.5 mils.
 - 3) Shop epoxy primed surfaced shall require abrasive blasting or abrading per SSPC-SP 7 prior to receiving finish coats if the maximum recoat limit has been exceeded for the primer. This cleaning shall produce a uniform surface profile of 1.0 to 1.5 mils in the intact primer.
 - b. Bare Ferrous Metal
 - 1) Prepare surface in accordance with SSPC SP-5 (White Metal Blast Cleaning) to 2.0 to 2.5 mil surface profile.
 - c. Nonferrous and Galvanized Metal
 - 1) Prepare in accordance with SSPC SP-16 to achieve a uniform 1.0 to 1.5 mil profile.
 4. System Thickness: Minimum 10 mils dry film.
 5. Primer
 - a. Field apply one coat of the epoxy primer at the manufacturer's recommended dry film thickness.
 - b. Products: Sherwin Williams, Macropoxy 646; Carboline, Carboguard 691; or equal.

6. Finish
 - a. Field apply one or more coats of the epoxy finish at the manufacturer's recommended dry film thickness per coat to the specified system thickness.
 - b. Product: Sherwin Williams, Macropoxy 646; Carboline, Carboguard 691; or equal.
- C. System No. 3 – Polyamidoamine Epoxy
 1. Surface: Metal.
 2. Service: Below grade (buried, exterior) in contact with soil.
 3. Surface Preparation
 - a. Shop-Primed Metal
 - 1) Clean shop-primed surfaces in accordance with SSPC SP-2 (Hand Tool Cleaning) or SSPC SP-3 (Power Tool Cleaning).
 - 2) Clean damaged shop-coated areas in accordance with SSPC SP-10 (Near White Metal Blast Cleaning) and spot prime with specified primer. Cleaning shall produce a surface profile of 2.0 to 2.5 mils.
 - 3) Shop epoxy primed surfaced shall require abrasive blasting or abrading per SSPC-SP 7 prior to receiving finish coats if the maximum recoat limit has been exceeded for the primer. This cleaning shall produce a uniform surface profile of 1.0 to 1.5 mils in the intact primer.
 - b. Bare Ferrous Metal
 - 1) Prepare surface in accordance with SSPC SP-10 (Near White Metal Blast Cleaning) to 2.0 to 2.5 mil surface profile.
 4. System Thickness: Minimum 16 mils dry film.
 5. Finish
 - a. Field apply two or more coats at the coating manufacturer's recommended dry film thickness per coat to the specified system thickness.
 - b. Product: Sherwin Williams, Macropoxy 646; Carboguard 890; or equal.
- D. System No. 4 – Acrylic (Latex)
 1. Surface: PVC and CPVC pipe.
 2. Service: Exterior; direct sunlight exposure.
 3. Surface Preparation
 - a. Clean plastic pipe with a solvent compatible with the specified primer.
 - b. Sand plastic pipe to uniformly abrade and de-gloss surfaces to achieve a surface profile of 1.0 to 1.5 mils. Vacuum clean after sanding to remove loose dust, plastic particles, and dirt.

4. System Thickness: Minimum 3 mils dry film.
 5. Primer
 - a. Field apply one coat of acrylic primer.
 - b. Thickness: To the coating manufacturer's recommended dry film thickness.
 - c. Product: Sherwin Williams, Extreme Bond; Carboline, Sanitile 120; or equal.
 6. Finish
 - a. Field apply one or more coats at the coating manufacturers recommended dry film thickness per coat to provide the specified system thickness.
 - b. Thickness: To system thickness.
 - c. Product: Sherwin Williams, Sher-Cryl HPA; Carboline, Carbocrylic 3359 DTM.
- E. System No. 5 – Polyurethane
1. Surface: Concrete
 2. Service: Interior, immersed
 3. Surface Preparation:
 - a. Complete and cure concrete construction for 30 days or more before starting surface preparation work.
 - b. Prepare surfaces in accordance with SSPC-SP 13/NACE 6 or ICRI 03732 to obtain CSP 4 to 6 roughness
 - c. Eliminate leaks and infiltrations and remove standing water
 - d. Resurface areas with excessive cavities or exposed aggregate
 - e. Surface must be free of dust, condensation and visible moisture before application
 4. System Thickness: 60 mils dry film
 5. Primer
 - a. Field apply one coat of epoxy primer.
 - b. Thickness: To the coating manufacturer's recommended dry film thickness.
 - c. Product: Sherwin Williams, Macropoxy 5500LT or Corobond 100 Primer; Carboline Carboseal 720
 6. Finish
 - a. Field apply one or more coats at the coating manufacturers recommended dry film thickness per coat to provide the specified system thickness.
 - b. Thickness: To system thickness.
 - c. Product: Sherwin Williams Poly-Cote 115; Carboline Reactamine 760

2.04 FINISH SCHEDULE

- A. The following Finish Schedule identifies major structures, equipment, and substrates to be coated in accordance with this Section (09 96 00). The Finish Schedule is not intended to be a complete listing of all surfaces to be coated and other requirements may be identified elsewhere in the Specifications or on the Drawings. There may be additional surfaces for the project that require coating application which may not be listed in the Finish Schedule, and the Contractor shall be responsible for coating those surfaces in accordance with the requirements of this Section(09 96 00).

Structure	Substrate	Coating System	Color
Exposed Ferrous Metal Piping, Equipment, and Structures	Ferrous Metal	No. 1	Determined by Owner
Potable Water Piping, Exposed	Ferrous Metal	No. 2	Determined by Owner
Submerged DIP	Ferrous Metal	No. 3	Determined by Manufacturer
Exposed PVC Piping	Thermoplastic	No. 4	Determined by Owner

- B. The Contractor shall be responsible to identify any surfaces for which there is a question about what standard coating system to apply. about what standard coating system to apply as part of the work covered by this Section (09 96 00) through a Request for Information.

PART 3 - EXECUTION

3.01 PRODUCT SHIPMENT, PROTECTION, AND STORAGE

- A. Comply with Section 01 66 00.
- B. Delivery
1. Deliver in original sealed containers identified with labels indicating manufacturer; product name and number; color, batch or lot number, and date of manufacture.
 2. Note the date of manufacture and apply coatings prior to the expiration of the guaranteed storage life.
 3. Coating materials exceeding storage life will be rejected.
- C. Storage
1. Store coating materials in enclosed structures to protect from weather and excessive heat or cold.
 2. Coatings stored at above or below manufacturers recommendations will be rejected.
 3. Comply with state and local requirements for flammable materials.

3.02 SCAFFOLDING

- A. Furnish, maintain, and remove scaffolding, ladders, planks required for application of coatings. Scaffolding, ladders, and rigging shall be designed for their intended use and shall comply with OSHA requirements.
- B. Where requested by the Owner, provide ladders or scaffolding to facilitate inspection of the specified work.

3.03 HEALTH AND SAFETY REQUIREMENTS

- A. General
 - 1. Comply with the applicable health and safety requirements of OSHA and the recommendations of the product manufacturer.
 - 2. Provide and require the use of proper personal protective and life saving equipment for all persons visiting or working in or about the project site.
- B. Ventilation: Ventilate work areas to control potential exposure and hazard to workers and employees of the plant.
 - 1. Furnish and install temporary ventilation system to remove contaminated air, vapors, and other potential hazardous substances from confined spaces and interiors of containment structures. Forced air ventilation is required during blast cleaning, abrasive removal, coating application, and curing in confined spaces.
 - 2. Ventilation system equipment shall be explosion proof, of industrial design, and of adequate capacity to reduce the concentration of air contaminants to the degree that a hazard to workers or employees of the plant does not exist. Size ventilation system to maintain air changes within the confined space per OSHA regulations.
- C. Illumination
 - 1. Provide spark proof artificial lighting for all work in confined spaces.
 - 2. Equip light bulbs with a protective cage to prevent breakage.
 - 3. For lighting fixtures and bulbs, comply with the requirements of Section 70 of the National Fire Protection Association (NFPA), "National Electric Code", for the applicable atmosphere.
 - 4. For lighting and other electrical systems, provide ground fault type, complying with NFPA 70.
 - 5. Provide the following minimum illumination during all phases of work:
 - a. General work area: 25-Foot Candles.
 - b. Surface preparation and coating application: 30-Foot Candles.
 - c. Inspection: 50-Foot Candles per SSPC-Guide 12.
 - 6. As directed by the Owner, provide additional illumination to fully illuminate all areas to be inspected.

D. Noise

1. Whenever the occupational noise exposure exceeds the maximum allowable sound level as set forth by OSHA regulations, the regional Air Pollution Control District and/or the Owner, provide and require the use of approved ear protection devices.
2. General maximum sound levels for the project are defined as those which will not affect routine facility or neighborhood activities.
3. Whenever levels are objectionable, or exceed these limits, adjust operations to reduce noise levels, as directed by the Owner or the local agency of jurisdiction.

E. Fire Extinguishers

1. Keep a minimum of two (2) ten pound (10-lb) ABC type fire extinguishers present in the work area whenever work is proceeding.
2. Train all personnel in the use of this type of fire extinguisher.

F. Comply with OSHA and applicable regulations and carefully follow the manufacturer's recommendations, precautions, and warnings regarding the handling and use of all surface preparation and coating materials and equipment.

G. Use coating equipment designed for application of the material specified and maintain in good working condition at all times.

3.04 ENVIRONMENTAL CONTROL

- A. Carefully contain paints and solvents. Do not allow them to penetrate the soil.
- B. Dispose of waste material in a legal manner. All stationary operating equipment shall be placed into secondary containment.

3.05 PREPARATION

A. General

1. Surface preparations for each type of surface shall be in accordance with the specific requirements of each Coating Systems Description. In the event of a conflict the Coating Systems Description shall take precedence.
2. Surfaces to be coated shall be clean and dry. Before applying coating or surface treatments, oil, grease, dirt, rust, loose mill scale, old weathered coatings, and other foreign substances shall be removed. Oil and grease shall be removed before mechanical cleaning is started. Where mechanical cleaning is accomplished by blast cleaning, the abrasive used shall be washed, graded and free of contaminants which might interfere with the adhesion of the coatings. The air used for blast cleaning shall be sufficiently free of oil and moisture to not cause detrimental contamination of the surfaces to be coated.
3. The Contractor shall verify at a minimum of two times daily that air supply is free of oil and moisture contamination (ASTM D-4285). The Contractor shall use effective oil and water separators in all main compressor airlines and shall be placed as close as practicable to the equipment. Prior to using compressed air, the Contractor shall test the quality of air downstream of the separators at

suitable outlets by blowing the air on clean white blotter for 2 minutes to check for any contamination, oil, or moisture.

4. Cleaning and coating shall be scheduled so that dust and spray from the cleaning process shall not fall on wet, newly coated surfaces. Hardware, hardware accessories, nameplates, data tags, machined surfaces, sprinkler heads, electrical fixtures, and similar uncoated items which are in contact with coated surfaces shall be removed or masked prior to surface preparation and painting operations. The Coating Inspector will examine surfaces after abrasive blast cleaning to verify that all deposits of contaminants have been removed as per surface clean as per ISO 8502 (Class 2). The Contractor shall blow down and vacuum all surfaces prior to Owner inspection. Tank floors shall be vacuumed. Following completion of coating, removed items shall be reinstalled. Equipment adjacent to walls shall be disconnected and moved to permit cleaning and painting of equipment and walls and, following painting, shall be replaced and reconnected.
5. Containment: The Contractor shall erect and maintain protective enclosures as required to ensure that surface preparation debris, including dust, is contained within the immediate work area. All costs associated with containment shall be paid by the Contractor.
6. Dust and Contaminants: Protect substrate from excessive dust and airborne contaminants during coating application and curing. Use temporary dust barriers to close off areas being painted from areas where other work is being performed.

B. Abrasive Blast Cleaning

1. When abrasive blast cleaning is required to achieve the specified surface preparation the following requirements for blast cleaning materials and equipment shall be met:
 - a. Used or spent blast abrasive shall not be reused on this project.
 - b. The compressed air used for blast cleaning shall be filtered and shall contain no condensed water and no oil. Moisture traps shall be cleaned at least once every four hours or more frequently as required to prevent moisture from entering the supply air to the abrasive blasting equipment.
 - c. Oil separators shall be installed just downstream of compressor discharge valves and at the discharge of the blast pot discharges. These shall be checked on the same frequency as the moisture traps as defined in Item 2 above.
 - d. Regulators, gauges, filters, and separators shall be in use on compressor air lines to blasting nozzles times during this work.
 - e. An air dryer or desiccant filter drying unit shall be installed which dries the compressed air prior to blast pot connections.
 - f. The air dryer shall be used and maintained for the duration of surface preparation work.
 - g. The contractor shall provide ventilation for airborne particulate evacuation (meeting pertinent safety standards) to optimize visibility for both blast cleaning and inspection of the substrate during surface preparation work.

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- d. Care must be taken to prevent contamination of the surface after blasting from worker's fingerprints, deleterious substances on workers' clothing, or from atmospheric conditions.

E. Thermoplastic

1. Prepare surfaces of PVC by sanding to establish uniform surface roughness and to remove gloss from the substrate. Vacuum clean surfaces to remove loose dust, dirt, and other materials. Next, solvent clean using clean white rags and allow solvent to completely evaporate before application of coating materials.

3.06 APPLICATION

A. Workmanship

1. Coated surfaces shall be free from excessive runs, sags, drips, ridges, waves, laps, and brush marks. Coats shall be applied to produce an even film of uniform thickness completely coating corners and crevices. Minor and infrequent runs and sags which are within the total specified DFT plus a few mils – no more than 10% more mils than the specified total DFT shall be acceptable. Frequent runs or sags which exceed these limits or are detrimental to coating system performance are not acceptable.
2. The Contractor's spray equipment shall be designed for application of the materials specified. Compressors shall have suitable traps and filters to remove water and oils from the air. Spray equipment shall be equipped with mechanical agitators, pressure gages, and pressure regulators, and properly sized spray tips.
3. Each coating application be applied evenly and sharply cut to line. Care shall be exercised to avoid overspray or spattering paint on surfaces not to be coated. Glass, hardware, floors, roofs, and other adjacent areas and installations shall be protected by taping, drop cloths, or other suitable measures.
4. Coating applications method shall be as recommended by the coating manufacturer.
5. Allow each coat to cure or dry thoroughly, according to the coating manufacturer's printed instructions, prior to recoating.
6. Vary color for each successive coat for coating systems when possible. When coating complex steel shapes, prior to overall coating system application, stripe coat welds, edges of structural steel shapes, metal cutouts, pits in steel surfaces, or rough surfaces with the prime coat. This involves applying a separate coat using brushes or rollers to ensure proper coverage. Stripe coat via spray application is not permitted.

B. Coating Properties – Mixing and Thinning

1. Coatings, when applied, shall provide a satisfactory film and smooth even surface. Glossy undercoats shall be lightly sanded to provide a surface suitable for the proper application and adhesion of subsequent coats. Coating materials shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Coatings consisting of two or more components shall be mixed in accordance with the coating manufacturer's instructions. Where necessary to suit the conditions

of the surface, temperature, weather and method of application, the coating may be thinned as recommended by the coating manufacturer immediately prior to use. The VOC of the coating as applied shall comply with prevailing air pollution control regulations. Unless otherwise specified, coatings shall not be reduced more than necessary to obtain the proper application characteristics. Thinner shall be as recommended by the coating manufacturer.

2. Mixing of partial “kits” is strictly prohibited unless authorized in writing by the coating manufacturer and the Owner. This prohibition also applies to coatings mixed for touchup or repairs. If authorized to mix partial kits, the contractor shall utilize containers with appropriate graduated markings/calibrated weight scales.

C. Environmental Conditions

1. Provide adequate heat, ventilation, and dehumidification to ensure that the coating manufacturer’s environmental requirements are met and to ensure no loss of production days due to failure to meet coating manufacturer’s environmental requirements.
2. Provide sufficient and continuous ventilation and air movement across coated substrates to remove volatile constituents (solvent) throughout the manufacturer’s published curing period.
3. Air and surface temperatures: Prepare surfaces, apply and cure coatings within air and surface temperature range recommended by coating manufacturer.
4. Relative humidity: Prepare surfaces, apply and cure coatings within relative humidity range in accordance with coating manufacturer’s instructions.
5. Dew Point: Do not apply coatings unless the temperature of the dew point is 5°F or greater than the temperature of the substrate.
6. Precipitation: Do not apply coatings in rain, snow, fog, or mist.
7. Wind: Do not spray apply coatings when the wind direction and velocity are such that overspray may result in property damage.

D. Protection of Coated Surfaces

1. Items which have been coated shall not be handled, worked on, or otherwise disturbed, until the coating is completely dry and hard. After delivery at the site, and upon permanent erection or installation, shop-coated metalwork shall be recoated or retouched with specified coating when it is necessary to maintain the integrity of the film.

E. Film Thickness and Continuity

1. WFT of the first coat of the coating system and subsequent coats shall be verified by the contractor, during application of each coat.
2. Coatings shall be applied to the minimum dry film thickness specified as indicated on the CDS. Dry film thickness shall be determined using the appropriate industry standard for the substrate (SSPC-PA 2, SSPC-PA 9, or ASTM D1400). Coatings determined to be above the maximum dry film thickness, as indicated herein or on the coating manufacturer’s product data sheet, will be removed at the Owner’s discretion.

3. The Inspector may, but is not required to, also measure coating thickness, at random locations, after each coat. SSPC –PA 2 (Level 1) is only to be used for the calibration of dry film thickness gauges. This is a minimum maximum dry film thickness specification. Dry film thickness readings will not be averaged. All inspection equipment shall be supplied by the Contractor. All equipment shall have current calibration certificates. The Owner reserves the right to use their own equipment at any time.
4. In testing for continuity of coating about welds, projections (such as bolts and nuts), and crevices, the Owner shall determine the minimum conductivity for smooth areas of like coating where the dry mil thickness has been accepted. This conductivity shall be the minimum required for these rough or irregular areas. Pinholes and holidays shall be recoated to the required coverage.
5. The ability to obtain specified film thickness is generally compromised when brush or roller application methods are used and, therefore, more coats may be needed to be applied to achieve the specified dry film thickness.
6. For concrete substrates, the Contractor shall apply a complete skim coat of the specified filler-surfacer material over the entire substrate prior to application of the coating system. This material shall be applied such that all open air voids and “bug holes” in the concrete substrate are completely filled prior to coating application.

F. Special Requirements

1. Before erection, the Contractor shall apply all but the final finish coat to interior surfaces of roof plates, roof rafters and supports, pipe hangers, piping in contact with hangers, and contact surfaces which are inaccessible after assembly. The final coat shall be applied after erection. Structural friction connections and high tensile bolts and nuts shall be coated after erection. Areas damaged during erection shall be hand-cleaned or power-tool cleaned and recoated with primer coat prior to the application of subsequent coats. Touch-up of surfaces shall be performed after installation. Surfaces to be coated shall be clean and dry at the time of application. Except for those to be filled with grout, the underside of equipment bases and supports that have not been galvanized shall be coated with at least two coats of intermediate coat specified for System 1 prior to setting the equipment in place. Provide coating system terminations at leading edges and transitions to other substrates in accordance with the coating manufacturer’s recommendations or detail drawings.

G. Soluble Salt Contamination of Metal Substrates

1. Contractor shall test in accordance with SSPC Guide 15 metal substrates to be coated that have been exposed to sea water or coastal air or to industrial fallout of particulate or other sources of soluble chlorides (such as waste water exposure). If testing indicates chloride levels in excess of 25 ppm exist after the surface preparation has been completed. The Contractor shall reclean and prepare these surfaces until chloride levels are below 25 ppm.

3.07 EXCLUSIONS

- A. Do not prepare or coat the following items or surfaces:
 - 1. Mortar coated pipe and fittings
 - 2. Sacrificial anodes and support wires
 - 3. Copper, brass
 - 4. Name Plates
 - 5. Fiberglass items
- B. Where surfaces specified as "not to be coated" are damaged, coated or otherwise do not comply with these Specifications, clean, repair or otherwise restore such surfaces to the satisfaction of the Owner, at no additional cost to the Owner.

3.08 INSPECTION AND TESTING

- A. Perform inspection and testing as specified. Include additional inspection, sampling and testing work that the Owner may require to verify compliance with these Specifications.
- B. Notify the Owner three (3) working days in advance of any field operations involving abrasive blast cleaning or coating applications.
- C. Assistance to Owner
 - 1. Coordinate work with the inspection, sampling and testing requirements of the Owner
 - 2. Assist the Owner as required for the performance of duties.
 - 3. Provide all lighting and scaffolding to enable the Owner to perform inspection and testing.
 - 4. Provide the level of illumination and scaffolding locations for inspection purposes as directed by the Owner.
 - 5. Furnish Owner with safety equipment and devices during abrasive blast cleaning, coating and painting operations. Provide a helmet with continuous fresh air supply for observation during cleaning operations and coating application.
- D. The Owner will perform such tests as are required to help ensure compliance with all phases of the surface preparation, and application of the coating systems. Provide test equipment including, but not be limited to the following: SSPC surface preparation standards; surface profile test tape; micrometer; abrasive sieve test; ultraviolet lamp; sling psychrometer; mirror; certified thickness calibration plates; magnetic type dry film thickness gage; and a nondestructive holiday detector.
- E. Inspection by the Owner does not relieve the Contractor of the responsibility of compliance with all the requirements of these specifications.
 - 1. In cases of dispute concerning surface profiles, film thickness, film continuity (holidays), etc., the Owner's measurements and tests shall be final. Abide by the Owner's decisions and directives.

2. Correct deficiencies in the continuity of the coating, or painting film or in the dry film thickness by applying additional coats as required, at the sole expense of the Contractor.
- F. The Owner will determine the degree and surface profile of the field blast cleaned surface per test method NACE RP0287. Perform additional blast cleaning over areas not conforming to the specified degree of surface preparation and surface profile.
- G. Perform tests on surfaces of abrasively blast-cleaned steel to detect oil and other contaminants which might be deposited on surfaces as a result of abrasive blasting operations. This may include chemical tests or ultraviolet (black light) tests, as required.
- H. Perform all mixing, thinning, application and holiday detection of coatings in the presence of the Owner.
- I. The Owner may completely inspect each application of coating to determine thickness and integrity.
1. Each coating application will be checked and deficiencies marked.
 2. After observing specified recoat time apply additional coating materials over areas not having the specified minimum dry film thickness and areas having any holidays or pinholes.
 3. After correction of deficiencies, the Owner will re inspect those areas to determine the acceptability of the additional coating.
 4. Each coating application must be one hundred (100) percent to the satisfaction of the Owner prior to proceeding with successive coating applications.
- J. Dry Film Thickness Measurement
1. Use an approved magnetic type non destructive dry film thickness gauge.
 2. Determine that the specified dry film thickness has been obtained.
 3. Measure specified dry film thickness' above the peaks of the surface profile.
 4. Perform as many dry film thickness measurements, as described in SSPC-PA2, as required to verify compliance with this specification. Use a Type II Constant Pressure Probe Dry Film Thickness Gauge.
- K. Furnish calibrated inspection devices in good working condition for detection of holidays and measurement of dry film thickness.
1. Calibrate and operated per manufacturer's instructions.
 2. Furnish U.S. Department of Commerce; National Bureau of Standards certified thickness calibrated plates to test the accuracy of dry film thickness gauges and certified instrumentation to test the accuracy of holiday detectors.
 3. Keep dry film thickness gauges and holiday detectors available onsite at all times until final acceptance of the application.
- L. Owner may elect to furnish inspection devices and render decisions based solely upon test results from these devices.

- M. For coating film continuity detection tests on interior structure coated surfaces with 20 mils or less dry film thickness, use a nondestructive holiday detector.
1. Provide personnel to operate coating film continuity detection devices under the direction of the Owner.
 2. Operate inspection devices per the manufacture's recommendations in accordance with NACE SPO188.
 3. Holiday test any tank lining or coatings that are to be used in immersion. The Contractor shall test all coated surfaces for pinholes (NACE SPO-188) and holidays after application of the final coat in accordance with the following:
 - a. Perform test in presence of the Owner Coating Inspector.
 - b. Perform test after coating has cured as recommended by the manufacturer.
 - c. Use an appropriate detector, such as Elcometer #236 or as approved by the Owner representative.
- N. Test the coating integrity of the interior surfaces below the overflow line.
1. Mark all pinholes and repair manufacturer's written recommendations, or as directed by the Owner; and then retest.
 2. Holidays or other irregularities are not permitted in the completed coating system.
 3. During the testing, keep the detecting blade in continuous contact with the coated surface.
 4. Do not proceed with holiday detection until the completed coating system has been cured per the manufacturer's recommendations.
- O. Upon completion of the epoxy application to the interior structure surfaces, retest for holidays those areas of the lower shell which may have been subjected to abrasive blast rebound from the floor, repaired as noted herein. Repair areas as required and retest.
- P. Measure anchor profile for prepared surfaces using a non destructive instrument such as a Testex Press O Film System.
- Q. The Owner will verify completion of the final cure of the interior lining using a solvent wipe test.
1. Solvent wipe test: Consists of rubbing a solvent saturated rag on the area to be tested per ASTM D5402, using solvent recommended by manufacturer.
 2. If any coating material is removed or the surface being tested becomes tacky, the coating is not fully cured. Extend curing time and if required continue dehumidification until the coating is fully cured.
- R. The Owner may suspend the work if the cleaning and coating operations of the Contractor are creating a localized condition detrimental to facility operation, personnel or adjacent property. In the event of an intermittent or emergency suspension of the work by the Owner, correct deficiencies immediately.
- S. Prepare, sign, and submit to the Owner daily inspection reports.

T. Nonconformance Reports

1. When a nonconformance report is required, prepare, sign, and submit to the Owner within one working day from the time that it is written.
2. After confirming that all non-conforming work has been corrected and/or the coating work is in compliance with this specification, prepare and submit a conformance verification report shall be completed for the specific item or area.
3. This report must be signed by the Inspector.

3.09 FINAL CLEANUP

- A. Leave all areas in a neat and presentable condition.
- B. Remove rubbish, construction debris and waste, surplus construction materials, scaffolding, tools, equipment, and coating, and thinner containers, and excess coating, and thinners, and other objectionable materials.
- C. Dispose of such materials away from the site of work and in conformance with all applicable codes, ordinances and regulations.
- D. Remove coating spots upon adjacent surfaces.
- E. Clean, repair or refinish all damage to surfaces resulting from the work.

3.10 WARRANTY INSPECTION

- A. Conduct a warranty inspection of all coating and painting work between the period of eleventh (11th) month through eighteenth (18th) month following final acceptance of the Contract work.
- B. The Owner will establish the date for the inspection and will notify the Contractor at least 30 days in advance. The Owner may, by written notice to the Contractor, reschedule the warranty inspection to another date within the eleventh through eighteenth month inspection period, or may cancel the warranty period altogether.
- C. Attendance
 1. Attend the warranty inspection.
 2. Notifying directly involved parties of the date and time of the inspection.
 3. The Owner suggests personnel present at the pre-construction conference be present at this inspection.
- D. Preparation
 1. The Owner will completely drain and hose clean sufficiently for inspection.
 2. Provide (Contractor) suitable lighting, ventilation and scaffolding for the structure inspection.
 3. Use SSPC – Guide 12 for Illumination, and provide a minimum of 200 candle foot illumination for inspection.
- E. Inspect visually the entire interior and exterior coating systems to determine whether any repair work is necessary or if a more detailed inspection will be needed.

F. Inspection Report

1. The Owner will prepare and deliver to the Contractor an Inspection Report.
 - a. The report will cover the warranty inspection, setting forth the number and types of failures observed, the percentage of the surface area where failure has occurred, and the names of the persons making the inspections.
 - b. Color photographs illustrating each type of failure will be included in the report.
 - c. A coating system failure is defined as any location where coatings have peeled off, bubbled, or cracked, and any location where rusting is evident.
 - d. Upon completion of inspection and receipt of Inspection Report, the Owner will establish a date for the Contractor to proceed with remedial work.

G. Commence repairs on the date established by the Owner and completed within one month (thirty days).

1. Repair all coating system failures.
 - a. Remove the deteriorated coating, clean the surface and recoat with the same coating system in strict accordance with the specification and manufacturer's recommendations, to the satisfaction of the Owner.
 - b. If the area of failure exceeds twenty five (25) percent of the area of a portion of the structures surface, then remove the entire coating system and recoat that surface. All costs for warranty inspection are the responsibility of the Contractor. Additional inspection and all costs for repair are the responsibility of the Contractor.

H. If the Contractor fails to complete the remedial work to the satisfaction of the Owner, the Owner may elect to perform the remedial work. The Contractor is liable for actual cost of all such remedial work, plus 20% for Owner's administrative cost.

I. Perform final cleanup in accordance with this Section.

END OF SECTION

SECTION 11 05 13

ELECTRIC MOTORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Low-voltage alternating current induction motors, 250 horsepower or less.
- B. This section does not specify medium voltage (over 600 volts) motors and specialty motors such as submersible motors, hoist motors, valve operator motors or torque rated motors.
- C. Unless specified otherwise, require electric motors to be provided by the manufacturer of the driven equipment per of Section 46 05 13.
- D. Unless specified otherwise in the particular equipment specifications, comply with these specifications.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 66 00 – Material and Equipment
 - 3. Section 01 78 23 – Operation and Maintenance Data
 - 4. Section 01 99 00 – Referenced Forms
 - 5. Section 46 05 13 – General Requirements for Equipment

1.03 QUALITY ASSURANCE

- A. Unit Responsibility
 - 1. Comply with Section 46 05 13.
 - 2. Unless otherwise specified, assign unit responsibility for motors to the individual manufacturers of the driven equipment.
- B. Product Delivery, Storage, and Handling
 - 1. Comply with Section 01 66 00.
- C. Basic Standards
 - 1. Manufacture per UL 674, UL 1004, NEMA Standard MG 1, and the requirements specified.

1.04 ENVIRONMENTAL CONDITIONS

- A. Refer to individual equipment sections and drawings for installation locations.

1.05 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Include a copy of the contract document control diagrams and process and instrumentation diagrams, with addenda updates, that apply to equipment in this section.
 - 1. Mark to show specific changes necessary for the equipment proposed in submittal.
 - 2. If no changes are required, mark the drawing or drawings "No Changes Required".
 - 3. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.
- C. Include the following items:
 - 1. Completed Motor Data Form (Section 01 99 00).
 - 2. For motors 100 horsepower and larger, a motor heating curve.
 - 3. Motor outline, dimensions, and weight.
 - 4. Manufacturer's descriptive information relative to motor features.
 - 5. Where a winding over-temperature device is required, provide a response curve for the temperature device.
 - 6. For all inverter duty motors, the motor manufacturer's certification that the motor is compatible with the adjustable frequency drive to be used with the motor as specified in this section.
 - 7. Motor performance data showing motor full load current, efficiency, and power factor for the motor operating at 25, 50, 75, 100 and 125 percent of full load.
 - 8. Operating and maintenance information specified in Section 01 78 23.
 - 9. Overhaul instructions for each motor 5 horsepower and above.

1.06 DESIGN REQUIREMENTS

- A. NEMA "B" design, unless otherwise specified.
- B. NEMA Class B temperature rise above 40 degrees C ambient.

1.07 WARRANTY

- A. Provide two year warranty from date of substantial completion unless manufacturer's standard warranty is longer.
- B. Complete the Extended Warranty Form in Section 01 99 00.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. General
 - 1. The Owner and Construction Manager believe the following candidate manufacturers are capable of producing equipment and/or products that will satisfy the requirements of this section.

2. Do not construe the preceding statement, as an endorsement of a particular manufacturer's products or that named manufacturers' standard equipment or products will comply with the requirements of this section.
 3. The below listed manufacturer's motors generally meet the class and performance requirements of this specification when furnished with appropriate modifications and additional features as specified.
- B. Horizontal Motors
1. Types 1 and 2 – Premium efficiency motors manufactured by General Electric Inc., Type KS; and Reliance Electric Co., Type XEX, or equal.
 2. Type 3 – Premium efficiency explosionproof motors manufactured by General Electric Inc., Type KS, Class I, Group D; and Emerson US Motor, Type LCE, or equal.
- C. Vertical Motors
1. Types 1 and 2 – Premium efficiency motors manufactured by General Electric Inc., Type KS; and Emerson US Motors, Type TUCE Corroduty, or equal.
 2. Type 3 – Premium efficiency explosionproof motors manufactured by General Electric Inc., Type KS, Class I, Group D; and Emerson US Motors, Type LUCE, or equal.
- D. Inverter Duty Motors
1. Baldor, Inverter Motor; General Electric, ASD; Reliance, RPM-AC (XT) and US Motors Varidyne Inverter Duty, or equal.

2.02 MATERIALS

- A. Cast iron frames for motors 1/2 horsepower and larger. Steel frames for motors smaller than 1/2 horsepower. Aluminum frame motors will not be permitted.
- B. Cast metal fan blades and shrouds.
- C. Stainless steel hardware.
- D. Nonhygroscopic leads.

2.03 NAMEPLATES

- A. Material: Engraved or stamped stainless steel or brass.
- B. Information: Include items listed in NEMA Standard MG 1, Paragraph 10.37, 10.38 or 20.60, as applicable.
- C. For motors 1/2 horsepower and larger, indicate the ABMA L-10 rated life for the motor bearings.
- D. For motors 2 horsepower and larger, list the nominal efficiency.
- E. For explosionproof motors, indicate UL frame temperature limit code.
- F. Permanently fasten to the motor frame and position for easy visible inspection.

2.04 MOTORS LESS THAN 1/2 HORSEPOWER

A. General

1. Type: Squirrel cage, single phase, capacitor start, induction run type.
2. The equipment manufacturer may provide normally supplied materials in lieu of those specified in Paragraph 2.02
3. For single phase motors provide Class B insulation.
4. Small fan motors may be split-phase or shaded-pole type.
5. Provide with copper windings.

B. Rating

1. 115 volts, single phase, 60 hertz.
2. Continuous-time rated per NEMA Standard MG 1, Paragraph 10.35.
3. Nonoverloading at all points of the equipment operation.

C. Enclosures

1. Comply with NEMA MG 1.
2. Unless otherwise specified, provide totally enclosed fan cooled or totally enclosed nonventilated enclosures.
3. Explosion Proof Motors
 - a. Furnish with UL Label for Class I, Division 1, Group D hazardous locations.
 - b. Provide an over temperature device in the enclosure to detect and automatically de-energize the motor if the enclosure surface temperature exceeds 260 degrees C.
 - c. Mark nameplate with UL frame temperature limit code T2B.

2.05 MOTORS 1/2 HORSEPOWER THROUGH 250 HORSEPOWER

A. General

1. Type: Three phase, squirrel cage, full voltage start induction type.
2. Unless otherwise specified, provide a NEMA MG 1-1.16 design for the duty service imposed by the driven equipment such as frequent starting, intermittent overload, high inertia, mounting configuration, or service environment.

B. Rating

1. 460 volts, three phase, 60 Hz.
2. Continuous time rated per NEMA Standard MG 1, paragraph 10.40.
3. Unless specified otherwise, provide a service factor of 1.15, but size not to exceed the nameplate rating at any point on the operating curve (non-overloading) of the driven equipment.

C. Classifications

1. General:

- a. Comply with the requirements specified in the following paragraphs.
- b. Definition of terms: Per NEMA MG 1.
- c. Temperature rise: for all motor types, do not exceed that permitted by Note II, paragraph 12.42, NEMA MG 1. The insulation shall be nonhygroscopic.

2. Type 1 Motors:

- a. Drip-proof guarded enclosures
- b. Class F insulation and Class B temperature rise at the motor's nominal rating.

3. Type 2 Motors:

- a. Totally enclosed, fan cooled.
- b. Class F insulation and Class B temperature rise at the motor's nominal rating.
- c. Conform to IEEE 841.
- d. Coat all internal surfaces with an epoxy paint.

4. Type 3 Motors

- a. Explosion proof motors, UL listed per UL 674 for Class I, Group D hazardous atmospheres.
- b. Class F insulation.
- c. Conform to IEEE 841.
- d. Provide UL-approved breather/drain device in the motor drain hole.
- e. Provide a frame temperature thermostat which meets the UL frame temperature limit code T2B (260 degrees C). Include automatically reset, normally closed contact rated 2 amperes at 115 volts AC.

D. Thermal Protection

1. Unless specified otherwise, provide thermal protection as defined in NEMA MG 1-12.53.1, as follows:

Motor type	Thermal Protection	
	Type 2 - Thermostats	Type 1 - RTDs
Noninverter duty	50-150 HP	200-250 HP
Inverter duty	1-60 HP	75-250 HP

2. Provide thermal protection in each stator winding.

- a. Thermostats: Bimetallic switch type, self-resetting.
- b. Resistance temperature detectors (RTDs): 10-ohm copper type (two per phase).
- c. On larger frame sizes where the motor manufacturer does not offer copper type RTDs, provide 100-ohm platinum type (two per phase).

3. For explosion proof motors, provide the motor winding thermal protection as specified above in addition to the motor frame thermostat specified in Paragraph 2.05.c.4.e.

E. Inverter Duty Motors

1. Use with adjustable frequency controllers employing Pulse Width Modulation (PWM) technology.
2. Do not exceed NEMA MG 1, Class B, temperature rise when operating over the specified speed range on the specified load speed/torque characteristics required by the associated driven equipment
3. Provide certification from the motor manufacturer of compatibility with the adjustable frequency controller to be used with the motor.
4. Designed to operate over the speed or frequency range specified.
5. Insulation: Meet NEMA MG 1, Part 31 (1600 volt peak at a minimum of 0.1 microsecond rise time).
6. Provide with thermal protection as specified above.
7. Provide Grounding Unit
 - a. Provide with a shaft grounding unit mounted on the fan housing with stub shaft extended from the motor shaft.
 - b. Equip with two brushes, totally enclosed and sealed against environmental contamination.
 - c. Exception: Grounding unit and brushes not required for vertical turbine pumps.
8. Totally Enclosed, Air-Over, Blower-Cooled (TEBC) Type
 - a. Provide where specified or required by the specified application requirements.
 - b. Blowers: Driven at constant speed by 460-volt, 3-phase motors meeting Type 2 requirements specified in Paragraph 2.04 C.3.
 - c. Manufacture blower and ducting as an integral part of the main motor frame.
 - d. Provide air intake filter.
 - e. Construct scroll case of cast aluminum or iron, and fan wheel of Type 304 stainless steel.
9. Inverter duty motors may be NEMA MG1-1.16, design A.

F. Vertical Motors

1. Provide solid-shaft P-base type specifically designed for vertical installation.
2. Universal position motors are not acceptable.
3. Comply with Type 2, Type 3, and/or Inverter Duty Motor requirements as specified.

4. Thrust bearing rating: Demonstrate compatibility with the loads imposed by the driven equipment.

G. Minimum Nameplate Efficiency

1. Determine per IEEE 112B testing procedures, when operating on a sinusoidal power source.
2. Comply with the following:

Motor Horsepower	Motor Minimum Efficiency, percent			
	900 rpm	1200 rpm	1800 rpm	3600 rpm
1	72.0	82.5	83.0	84.0
1.5	75.5	84.0	85.0	84.0
2	81.5	85.5	82.5	82.5
3	86.5	88.5	89.5	87.5
5	87.5	89.5	89.5	89.1
7.5	88.5	91.0	91.7	90.2
10	89.5	91.1	91.7	91.0
15	89.8	91.7	92.4	91.7
20	90.2	91.7	93.0	91.7
25	91.0	92.4	93.5	92.0
30	91.0	93.0	93.6	92.4
40	91.7	93.6	94.1	93.0
50	92.4	93.6	94.1	93.0
60	93.0	93.9	94.5	93.6
75	93.0	94.5	95.0	94.1
100	93.6	94.5	95.4	94.5
125	94.5	94.5	95.4	94.9
150	94.5	95.4	95.8	95.0
200	94.5	95.4	95.8	95.4
250	94.5	95.4	95.8	95.4

H. Conduit Boxes

1. Type: Cast iron, split construction with threaded hubs.
2. Conform to IEEE 841.
3. Furnish at least one size larger than NEMA standard for the given motor size.
4. Design to rotate in order to permit installation in any of four positions 90 degrees apart.
5. Furnish with petroleum-resistant gaskets at the base of the conduit box and between the halves of the conduit box.
6. Provide grounding lug located within the box for the ground connection.

7. Minimum length of pigtail leads:
 - a. 12 inches for motors up to 50 horsepower.
 - b. 16 inches for motors larger than 50 to 250 horsepower.
- I. Bearings
 1. Type: Oil or grease lubricated ball or angle contact roller bearings.
 2. Rating: Minimum L-10 life of 100,000 hours per ABMA 9 or 11 at the ambient temperature specified.
 3. Motor designs employing cartridge type bearings will not be accepted.
 4. Fit with lubricant fill and drain or relief fittings.
- J. Lifting Eyes
 1. Fit motors weighing more than 50 pounds with at least one lifting eye.
- K. Current Imbalance
 1. Base upon the lowest value measured.
 2. Do not exceed the values tabulated below when the motor is operating at any load within its service factor rating and is supplied by a balanced voltage system:
 - a. Under 5 horsepower: 25 percent
 - b. 5 horsepower and above: 10 percent
- L. Space Heaters
 1. Where specified, size and design to prevent condensation inside the motor enclosure after shutdown.
 2. Type: Cartridge or flexible wraparound type.
 3. Power Requirements: 120 volts, single phase, 60 Hz.
 4. Mark the rating in watts and volts on the motor nameplate or on a second nameplate.
 5. Bring terminals to a separate terminal block or to pigtails in the conduit box.

PART 3 - EXECUTION

3.01 TESTING

- A. Perform winding insulation resistance and current imbalance testing as specified in Division 16.
- B. Test for correct rotation during preoperational checkout.

END OF SECTION

SECTION 40 61 96.13

PROCESS CONTROL DESCRIPTIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Instrumentation control loops.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 78 23 – Operation and Maintenance Data

1.03 SYSTEM DESCRIPTION

- A. The control loop descriptions provide the functional requirements of the control loops represented in the Contract Documents.
- B. Descriptions are provided as follows:
 - 1. Control system overview and general description.
 - 2. Major equipment to be controlled.
 - 3. Major field mounted instruments (does not include local gages).
 - 4. Manual control functions.
 - 5. Automatic control functions/interlocks.
 - 6. Major indications provided at local control panels and motor starters/VFD's.
 - 7. Remote indications and alarms.
- C. The control loop descriptions are not intended to be an inclusive listing of all elements and appurtenances required to execute loop functions, but are rather intended to supplement and complement the Drawings and other Specification Sections.
 - 1. The control loop descriptions shall not be considered equal to a bill of materials.
- D. Provide instrumentation hardware and software as necessary to perform control functions specified herein and shown on Drawings.

1.04 SUBMITTALS

- A. See Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
- B. Contract Closeout Information:
 - 1. Operation and Maintenance Data:
 - a. See Section 01 78 23 for requirements for the mechanics, administration, and the content of Operation and Maintenance Manual submittals.

- C. Control Strategy for Record Documents:
 - 1. Obtain this Specification Section in electronic format (Microsoft Word) from Engineer at beginning of Project.
 - 2. Revise and update the file monthly during construction and start-up to reflect all changes that occur due to specific equipment and systems supplied on the Project.
 - a. Show all revisions in 'track change' mode.
 - b. Change Specification Section Title to read "Control Loop Descriptions - Contractor Record Document."
 - c. Reference all changes by Request for Information (RFI) number or Change Proposal Request (CPR) number.
 - d. Submit revised file monthly to Engineer for review.
- D. Deliver the revised and updated file as a final control loop description Record Document in the Operation and Maintenance Manual described in Specification Section 01 78 23.
- E. Provide both paper copy and electronic copy (on CD-ROM) of the Record Document control loop descriptions in the Operation and Maintenance Manual described in Specification Section 01 78 23.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.01 CONTROL LOOPS

- A. This Section includes control loops for Phase 1. The Phase 1 package that each control loop is associated with is noted below. Programming and other work associated with Phase 1 control loops shall not be included in the bid price for Phase 2.

CONTROL STRATEGY 11 – DEWATERING SCREW PRESS SYSTEM

1.1 REFERENCES

- A. Drawings:
 - 1. M-XXX
 - 2. E-XXX
 - 3. I-XXX
- B. Specifications:
 - 1. Section 46 XX XX

1.2 SYSTEM COMPONENTS

- A. Major Equipment and Related Devices
 - 1. Conditioning Tank
 - a. Mixer: MIX-250-01
 - b. Level Switch: LSH-250-01
 - 2. Dewatering Screw Press
 - a. Screw Press: DEW-250-02
 - b. Level sensor: LE-250-02
 - c. Level indicator/transmitter: LIT-250-02
 - 3. Conveyors
 - a. Conveyors: CON-250-03, CON-250-04, CON-250-05
 - b. Zero speed switches SSL-250-03, SSL-250-04, SSL-250-05
 - c. Emergency stop hand cables HS-250-03, HS-250-04, HS-250-05
- B. Knife gate valve with motorized actuator
 - a. Knife gate valve: KGV-250-01
 - b. LOCAL/OFF/REMOTE selector switch
 - c. OPEN/CLOSE selector switch
- C. Spray water control devices
 - 1. Motorized ball valves: VLV-250-XX, VLV-250-XX, VLV-250-XX
 - 2. Flow switches: FS-250-XX, FS-250-XX, FS-250-XX
- D. Flow Instruments
 - 1. Digested Sludge Flow Meter/Transmitter FE/FIT-250-00
- E. Local Control Station
 - 1. Panel: LCS-250-01
 - 2. LOCAL/OFF/REMOTE selector switches: HS-250-01, HS-250-02, HS-250-03, HS-250-04, HS-250-05
 - 3. START and STOP push buttons: PB-250-01B, PB-250-02B, PB-250-03B, PB-250-04B, PB-250-05B, PB-250-01C, PB-250-02C, PB-250-03C, PB-250-04C, PB-250-05C
 - 4. FAST STOP push buttons: PB-250-01A, PB-250-02A, PB-250-03A, PB-250-04A, PB-250-05A
 - 5. SPEED selector dials: XX-250-XX, XX-250-XX
 - 6. Running & Fault Lights: YL-250-01A, YL-250-02A, YL-250-03A, YL-250-04A, YL-250-05A, YA-250-01A, YA-250-02A, YA-250-03A, YA-250-04A, YA-250-05A
- F. MCC Devices:
 - 1. Variable Speed Drives: VFD-250-01, VFD-250-02
- G. Motor Starters: MS-250-03, MS-250-04, MS-250-05

1.3 SYSTEM INTEGRATOR SCOPE

- A. All PLC and SCADA programming shall be furnished and installed by the Owner's System Integrator. All references within this document that include System Integrator's scope shall be considered for

reference only by the Contractor. The scope shall include the following:

1. PLC and SCADA software and programming
2. Operator Interface Terminal and SCADA workstation screen development and programming.

1.4 DESCRIPTION

The Dewatering Facility consists of the following components:

- Digested sludge flow meter
- Conditioning tank with mixer
- Screw press
- Polymer blending unit
- Screw press water spray system with control valve
- Inclined shaftless screw conveyor between the screw press and primary dumpster with two discharge points and an isolation knife gate on the most upstream discharge point
- A horizontal shaftless screw conveyor between the most upstream discharge point on the inclined conveyor and the standby dumpster
- A lidding system on the primary dumpster that has a built-in shaftless screw conveyor, a hinge assembly on one side of the lid, and hoist to lift the other end of the lid

When the digested sludge pump turns on and a flow signal is detected at the digested sludge flow meter, the polymer blending unit shall turn on and begin pumping polymer into the conditioning tank. The conditioning tank mixer shall also turn on. The polymer blending unit shall operate as described in Control Strategy 12. The conditioning tank mixer shall operate at an operator adjustable speed.

Digested sludge mixed with polymer will flow from the conditioning tank into the screw press head box. When the level in the screw press headbox reaches an operator adjustable setpoint, the screw press shall turn on and operate in either Constant Flow Mode or Variable Flow Mode as described below. In Constant Flow Mode, the digested sludge and polymer flow are constant, but the screw press speed varies to maintain level in the screw press headbox. In Variable Flow Mode, the screw press speed is constant, but the digested sludge and polymer flow are varied to maintain level in the screw press headbox.

When the screw press is running, the three spray water control valves shall open one at a time in series. The first valve shall open for an operator adjustable length of time (e.g. 5 – 15 minutes) then close. The next valve shall open for an operator adjustable length of time (e.g. 5 – 15 minutes) then close. The final valve shall open for an operator adjustable length of time (e.g. 5- 15 minutes). Then the cycle shall repeat.

When the screw press is running, the inclined conveyor shall also be running, and the inclined conveyor knife gate valve shall be in the open position. The inclined conveyor knife gate valve and horizontal conveyor are controlled in local/manual mode only and are normally not in use. These pieces of equipment will be used when the primary dumpster is taken of service and the standby dumpster is being used. The dumpster lidding system hoist is also controlled in local/manual mode only independently of the PLC. The hoist is used to lift the lid up when the primary dumpster needs to be removed from the building.

There shall be two shutdown modes for the Dewatering Screw Press System: Auto Shutdown and Immediate Shutdown. In Auto Shutdown Mode the equipment shall be shut down as follows: the polymer system shall stop, the sludge feed pump shall stop, the flocculation tank mixer shall stop, the screw press shall continue running for an operator adjustable amount of time then turn off, and the inclined conveyor shall continue running for an operator adjustable amount of time then turn off. In Immediate Shutdown Mode all equipment shall turn off immediately.

The following conditions/alarms shall trigger Auto Shutdown Mode: sludge feed pump fault, sludge feed low flow, polymer system fault, flocculation tank mixer VFD fault, flocculation tank High-High level, screw press head box High-High level. The following conditions/alarms shall trigger Immediate Shutdown mode: screw

press motor VFD fault, conveyor motor fault, conveyor E-stop pull cord activated, conveyor zero speed switch trip, any equipment FAST stop push button activated.

1.5 LOCAL MANUAL OPERATION

Local manual operation of the conditioning tank, screw press, inclined conveyor, conveyor knife gate valve, lidding system conveyor, and horizontal conveyor can be initiated by using the LOCAL/OFF/REMOTE selector switches for each piece of equipment on the local control station in the dewatering area. The equipment can then be operated using the START/STOP pushbuttons, OPEN/CLOSE push buttons, and SPEED selector dials on the local control station.

Local manual operation of screw press spray water valve can be initiated using the local manual override on the valve.

1.6 REMOTE MANUAL OPERATION

Remote manual operation of the conditioning tank, screw press, screw press spray water control valve, inclined conveyor, conveyor knife gate valve, lidding system conveyor, and horizontal conveyor can be initiated by setting the LOCAL/OFF/REMOTE selector switches for each piece of equipment on the local control station in the dewatering area to REMOTE. Then, from the Dewatering Facility graphic display screen on the SCADA system, the MANUAL/AUTO selector switch for each piece of equipment should be toggled to MANUAL. The equipment can then be controlled with the controls on the SCADA control screen.

1.7 REMOTE AUTOMATIC OPERATION

Remote automatic operation of the conditioning tank, screw press, screw press spray water control valve, inclined conveyor, and lidding system conveyor can be initiated by setting the LOCAL/OFF/REMOTE selector switches for each piece of equipment on the local control station in the dewatering area to REMOTE. Then, from the Dewatering Facility graphic display screen on the SCADA system, the MANUAL/AUTO selector switch for each piece of equipment should be toggled to AUTO. The equipment will then be controlled as described in Section 1.3.

1.8 SUMMARY OF LOOP FUNCTIONS

- A. Refer to the I/O list, P&IDs, and PLC drawings.

1.9 SCADA SCREENS

- A. Digested Sludge Flow Indication
- B. Conditioning Tank High Level Indication
- C. Conditioning Tank Mixer VFD Ready Indication
- D. Conditioning Tank Mixer VFD Running Indication
- E. Conditioning Tank Mixer VFD in Remote Indication
- F. Conditioning Tank Mixer VFD Fault Indication
- G. Conditioning Tank Mixer VFD Fast Stop Indication.
- H. Conditioning Tank Mixer VFD Start Command Indication
- I. Conditioning Tank Mixer VFD Speed Command Indication
- J. Conditioning Tank Mixer VFD Speed Feedback Indication
- K. Screw Press Head Box Level Indicator
- L. Screw Press VFD Ready Indicator
- M. Screw Press VFD Running Indicator

- N. Screw Press VFD in Remote Indicator
- O. Screw Press VFD Fault Indicator
- P. Screw Press VFD FAST STOP
- Q. Screw Press VFD Start Command Indicator
- R. Screw Press VFD Speed Command Indicator
- S. Screw Press VFD Speed Feedback Indicator
- T. Conveyor Zero Speed Indicator
- U. Conveyor E-Stop & Pull Cord Indicator
- V. Conveyor Motor Running Indicator
- W. Conveyor Motor in Remote Indicator
- X. Conveyor Motor Fault Indicator
- Y. Conveyor Motor Fast Stop Indicator
- Z. Conveyor Motor Start Indicator

1.10 HISTORICAL TRENDING

- A. Digested Sludge Flow
- B. Screw Press Head Box Level
- C. Screw Press Run Time hours
- D. Conveyor Run Time Hours

1.11 ALARMS

- A. Digested Sludge Flow Meter LOW FLOW
- B. Digested Sludge Flow Meter OUT OF RANGE
- C. Digested Sludge Flow Meter LOSS OF COMMUNICATIONS
- D. Conditioning Tank Mixer VFD FAULT. Reset by pressing the reset pushbutton on the VFD. Additionally, the fault may be reset by placing the LOR selector switch at the Local Control Station in the OFF position
- E. Conditioning Tank HIGH LEVEL switch.
- F. Screw Press VFD FAULT. Reset by pressing the reset pushbutton on the VFD. Additionally, the fault may be reset by placing the LOR selector switch at the Local Control Station in the OFF position.
- G. Screw Press FAST STOP.
- H. Screw Press Head Box HIGH LEVEL
- I. Conveyor E-STOP & PULL CORD

1.12 INTERLOCKS

- A. The Conditioning Tank Mixer FAST STOP switch is hardwired to the Conditioning Tank Mixer VFD.
- B. The Screw Press FAST STOP switch is hardwired to the Screw Press VFD.
- C. The Conveyor E-STOP switches and PULL CORDS are hardwired to the Conveyor Motors.

END OF SECTION

CONTROL STRATEGY 12 – POLYMER BLENDING UNIT

2.1 REFERENCES

- A. Drawings:
 - 1. M-XXX
 - 2. E-XXX
 - 3. I-XXX
- B. Specifications:
 - 1. Section 46 XX XX

2.2 SYSTEM COMPONENTS

- A. Major Equipment and Related Devices:
 - 1. Polymer storage tote
 - 2. Polymer system skid POL-250-04
 - 3. Polymer feed pump PMP-250-XX
 - 4. Mixing Chamber XXX-250-XX
 - 5. Mixer MIX-250-XXX
- B. Pressure and Flow Devices:
 - 1. Pressure Indicators: PI-250-04, PI-250-05
 - 2. Flow Switches: FSL-250-XX, FSL-250-XX
 - 3. Flow Indicators: FI-250-04, FI-250-XX
- C. Potable water dilution water piping assembly
 - 1. Pressure regulating valve
 - 2. Pressure Indicator PI-250-XX
 - 3. Water control valve SV-250-04
- D. Vendor supplied local control station
 - 1. Panel: LCS-250-04
 - 2. LOCAL/OFF/REMOTE selector switch: HS-250-04
 - 3. START and STOP push buttons: PB-250-XX, PB-250-XX
 - 4. Pump SPEED selector dial: XX-250-XX
 - 5. Power ON, System RUNNING, and FAULT lights: YL-250-XX, YL-250-XX, YA-250-XX
 - 6. Fast Stop pushbutton: PB-250-XX
 - 7. Polymer flow readout
- E. Shower and Eye Wash
 - 1. Flow Switch FS 800-01

2.3 SYSTEM INTEGRATOR SCOPE

- A. All PLC and SCADA programming shall be furnished and installed by the Owner's System Integrator. All references within this document that include System Integrator's scope shall be considered for reference only by the Contractor. The scope shall include the following:
 - 1. PLC and SCADA software and programming
 - 2. Operator Interface Terminal and SCADA workstation screen development and programming.

2.4 DESCRIPTION

The polymer blending unit in the Dewatering Facility consists of the following components:

- Polymer system skid with polymer feed pump, mixing chamber, dilution water control valve, and associated piping, valves, and instruments
- Polymer storage tote

- Potable water dilution water piping

When the digested sludge pump turns on and a flow signal is detected at the digested sludge flow meter, the polymer blending unit shall be called to run and controlled via the vendor supplied panel for the polymer blending unit. The panel shall operate the polymer feed pump, potable dilution water control valve, and mixer to achieve an operator adjustable target polymer dose based on the digested sludge flow rate and operator adjustable stored polymer concentration. The local control station shall monitor the feed pump flow switch and dilution water flow switch and alarm if flow is detected below and operator adjustable set point. The feed pump shall turn off and the potable water dilution water control valve shall shut in response to these alarms.

2.5 LOCAL MANUAL OPERATION

Local manual operation of the polymer blending unit can be initiated by using the LOCAL/OFF/REMOTE selector switch on the vendor supplied local control panel to LOCAL. The system can then be controlled using the START/STOP pushbuttons and SPEED selector dials on the panel. Dilution water flows can be adjusted manually using the rotary valves and rotameters on the polymer skid.

2.6 REMOTE MANUAL OPERATION

Remote manual operation of the polymer blending unit can be initiated by setting the LOCAL/OFF/REMOTE selector switch on the vendor supplied local control panel to REMOTE. Then, from the Dewatering Facility graphic display screen on the SCADA system, the MANUAL/AUTO selector switch for each piece of equipment should be toggled to MANUAL. The equipment can then be controlled with the controls on the SCADA control screen.

2.7 REMOTE AUTOMATIC OPERATION

Remote automatic operation of the polymer blending unit can be initiated by setting the LOCAL/OFF/REMOTE selector switch on the vendor supplied local control panel to REMOTE. Then, from the Dewatering Facility graphic display screen on the SCADA system, the MANUAL/AUTO selector switch for each piece of equipment should be toggled to AUTO. The equipment will then be controlled as described in Section 1.3.

2.8 SUMMARY OF LOOP FUNCTIONS

- Refer to the I/O list, P&IDs, and PLC drawings.

2.9 SCADA SCREENS

- Polymer System Set Point
- Polymer System Running Indicator
- Polymer System in Remote Indicator
- Polymer System Speed Control Indicator
- Polymer System Remote Start Indicator
- Polymer System Flow Fault Indicator
- Polymer System Fast Stop Indicator

2.10 HISTORICAL TRENDING

- Polymer System run time hours

2.11 ALARMS

- Polymer System FLOW FAULT
- Shower / Eyewash Flow Switch WATERFLOW ALARM

2.12 INTERLOCKS

- A. The FAST STOP switch on the Polymer System Control Panel is hardwire interlocked to the starter in the control panel.

END OF SECTION

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SECTION 40 78 00

PANEL MOUNTED EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements pertaining to the construction and installation of the control panels.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. National Electrical Contractors Association (NECA)
 - 2. National Electrical Installation Standard (NEIS)
 - a. 5055, Standard of Installation
 - 3. National Fire Protection Association (NFPA)
 - a. 70, National Electrical Code (NEC)
 - b. 79, Electrical Standard for Industrial Machinery
 - 4. Underwriters Laboratories, Inc. (UL)
 - a. 3121-1, Standard for Safety for Process Control Equipment
 - b. 508, Industrial Control Equipment
 - c. 698A, Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations
 - 5. National Electrical Manufacturer's Association (NEMA)
 - a. 250, Enclosures for Electrical Equipment
 - b. ICS 1-2000, Industrial Control and Systems General Requirements

1.03 SUBMITTALS

- A. Contractor shall submit all the product data in Division 40 at the same time. Piecemeal submittals will be rejected as incomplete.
- B. Submittal Format:
 - 1. The product data shall be provided as individual PDFs for each Section, unless otherwise noted for specific items. Each PDF shall be numbered to match the specification Section numbers. Submittals not itemized and labeled as specified will be rejected as incomplete.
 - 2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.

3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.
4. Submittals in PDF shall include an index, table of contents, or bookmarks with hyperlinks to the associated page of all submitted items. Index shall include each product specified with their corresponding Reference Keynote Number. Electronic submittals not containing a linked index, table of contents, or bookmarks will be rejected as incomplete.

C. Product Data

1. Pursuant to Section 01 33 00 – Submittals.
2. Manufacturer's data including materials of construction, methods of installation and related information for each item specified in PART 2 PRODUCTS.

D. Shop Drawings

1. Dimensional drawings showing the overall length, width, and height of the assembled control panel. Included on these drawings shall be the back panel layout of installed control devices showing part numbers, dimensions, nameplate text, and other details required for a complete assembly. The CONTRACTOR shall obtain the Drawings for the control panel layout and schematic from the ENGINEER. The CONTRACTOR shall modify the Drawings as required for submittal and for as-built documentation. The CONTRACTOR shall not generate their own drawings.
2. For large control panel, physical properties, handling, mounting, shipping break point locations shall be shown in submittal drawings. This shall include total weight, lifting instructions, height, and floor space required.
3. Provide electrical schematic drawings that include: wiring details such as internal and field connection terminal block numbers; shielded wire termination requirements; grounding requirements; and wire colors. Show all required internal and external interlocking. Each drawing shall be circuit specific for the system submitted. No typical schematic drawings shall be submitted.
4. Drawings shall list the equipment number of the box, control panel, or center submitted.
5. Component designations shall match those shown on the Drawings.
6. Complete bills of materials shall be included with submittal.

1.04 QUALITY ASSURANCE

A. Qualifications

1. Equipment provided as part of this section shall be manufactured by a single licensed firm, regularly engaged in the design and manufacture of such equipment for a minimum of five years. The control panels shall have a UL508A listing. Components within control panels shall be listed in a manner consistent with UL508A requirements.

1.05 MAINTENANCE

- A. Manufacturer shall provide and list in the bill of materials the following spare parts.
 - 1. One each of all power and control fuses provided in the assembled control panel/center.
- B. Provide Operation and Maintenance Data and Manuals Pursuant to the Contract Documents.

PART 2 - PRODUCTS

2.01 COMPONENTS

- A. Stainless Steel, NEMA 4X Enclosures (407800.E01).
 - 1. Enclosures shall be provided as shown on the Drawings.
 - 2. Enclosures shall be provided with accessories as shown on the Drawings and as specified below.
 - 3. Enclosures in damp, wet, corrosive, or outdoor locations shall be: constructed of stainless steel (NEMA 4X) with zinc electroplated (galvanized) steel back-panel; continuous hinged with gasketed doors and screw down clamps.
 - 4. Provide manufacturer supplied swing-out deadfront door within the enclosure.
 - 5. Enclosures in outdoor locations shall be equipped with a hasp and staple for padlocking.
 - 6. Provide Hoffman enclosures, or approved equal.
- B. Panel Vents (407800.V01).
 - 1. Panel Vents shall be provided as shown on the Drawings.
 - 2. Provide Hoffman number ANMV3, or approved equal.
- C. Enclosure Heater (407800.H17).
 - 1. Enclosure heaters shall be provided as shown on the Drawings.
 - 2. Enclosure heaters shall operate on 115 VAC.
 - 3. Enclosure heaters shall be provided with integral mounted thermostats.
 - 4. For 100W heaters, provide Hoffman model DAH1001A, or approved equal.
 - 5. For 200W heaters, provide Hoffman model DAH2001A, or approved equal.
- D. Enclosure Lighting (407800.L01).
 - 1. Enclosure lighting shall be provided as shown on the Drawings.
 - 2. Enclosure lighting shall be LED.
 - 3. Lamp shall be provided by CONTRACTOR.
 - 4. Enclosure lighting shall be operated via a remote door switch.
 - 5. Enclosure lighting shall be 115 VAC powered.
 - 6. Provide Hoffman model LEDA1S35 light with door switch, or approved equal.

E. Power Circuit Breaker (407800.C02).

1. Power circuit breakers shall be provided as shown on the Drawings.
2. Power circuit breakers shall be current-limiting and designed to interrupt and isolate electrical power to individual power circuits and components deriving power from the enclosure.
3. Power circuit breakers shall be UL489 listed.
4. Power circuit breakers shall have the number of poles as indicated on the Drawings.
5. Power circuit breakers shall have current interruption ratings of 10K RMS symmetrical amperes, minimum, with voltage ratings and current trip ratings as shown on the Drawings.
6. Power circuit breakers shall have fast acting (type "B" trip curve), normal (type "C" trip curve) and high inrush (type "D" trip curve) trip characteristics as dictated by the connected load.
7. Power circuit breakers shall be panel mounted on DIN rail.
8. Power circuit breakers shall include a positively trip-free mechanism that cannot be defeated by holding the handle in the ON position.
9. Power circuit breakers shall be wire connected and include terminal lugs.
10. Provide Eaton Cutler-Hammer type FAZ-NA, or approved equal.

F. Power Circuit Breaker Accessories (407800.C04).

1. Provide busbar for one-pole, two-pole or three-pole circuits when shown on the Drawings. The busbar shall be the same manufacturer as the power circuit breaker. Provide Eaton Cutler-Hammer busbar catalog number Z-SV/UL-16/___-___/_, or approved equal.
2. Provide busbar shroud on all unused terminals. The shroud shall be the same manufacturer as the busbar.
3. Provide Eaton Cutler-Hammer busbar shroud catalog number ZV-BS-UL, or approved equal.
4. Provide a bus connector to supply the power feed to the bus bar as shown on the Drawings. The bus connector shall be the same manufacturer as the busbar.
5. Provide Eaton Cutler-Hammer bus connector catalog number Z-EB/50/UL, or approved equal.

G. Motor Circuit Protector (407800.C05).

1. Motor circuit protectors shall be provided as shown on the Drawings.
2. Motor circuit protectors shall be energy-limiting and designed to interrupt and isolate electrical power to individual power circuits and components deriving power from the enclosure.
3. Motor circuit protectors shall be UL489 listed.

4. Motor circuit protectors shall have the number of poles as indicated on the Drawings.
 5. Motor circuit protectors shall have current interruption ratings of 10K RMS symmetrical amperes, minimum, with voltage ratings and current trip ratings as shown on the Drawings.
 6. Motor circuit protectors shall have fast acting, normal and high inrush trip characteristics as dictated by the connected load.
 7. Motor circuit protectors shall be panel mounted.
 8. Motor circuit protectors shall include a positively trip-free mechanism that cannot be defeated by holding the handle in the ON position.
 9. Motor circuit protectors shall be wire connected and include terminal lugs.
 10. Provide Cutler-Hammer type HMCP, or approved equal.
- H. Miniature "Ice Cube" Relays (24 VDC) (407800.R05).
1. Provide relays as shown on Drawings.
 2. Relays shall be industrial plug-in blade style with the on/off status indicated by either a neon or LED indicating light or by mechanical means.
 3. Relays shall be Form C contacts with a minimum of 4 poles and 7-amp contact rating.
 4. Relay coil voltage shall be 24VAC.
 5. Provide with DIN rail mounting screw terminal socket and retainer clips.
 6. Relay bases shall be of the same manufacturer as the relay.
 7. Provide Allen-Bradley p/n 700-HC24A24 relays, p/n 700-HN104 screw terminal sockets, and p/n 700-HN114 retainer clips, or approved equal.
- I. Time Delay Relays (407800.R12).
1. Time delay relays shall be provided as shown on the Drawings.
 2. Time delay relays shall be either time delay on energize (TDOE), or time delay on de-energize (TDODE) as indicated on the Drawings.
 3. Time delay relays shall be provided with a timing range as indicated on the Drawings.
 4. Time delay relays shall be industrial plug-in blade style.
 5. Time delay relays shall indicate the timed out status by either a neon indicating light, LED indicating light, or by mechanical means.
 6. Time delay relays shall be provided with a minimum of three Form C contacts, and 10 Amp contact rating.
 7. Time delay relay coil voltage shall be either 120 VAC or 24 VDC as indicated on the Drawings.

8. Time delay relays shall be provided with DIN rail mounting bases and hold down clips.
 - a. Relay bases shall be of the same manufacturer as the relay.
9. Provide Idec RTE Series, or approved equal.
- J. Control Fuses (407800.F01).
 1. Control Fuses shall be provided as shown on the Drawings.
 2. Control Fuses shall interrupt and isolate electrical power to individual control circuits and components within each enclosure and for circuits and components located outside each enclosure but deriving power from the enclosure.
 3. Control Fuses shall be rated at 250 VAC minimum and with current ratings as shown on the Drawings.
 4. Control Fuses shall have fast acting and time delay characteristics as dictated by the connected load.
 5. Provide five (5) spare fuses of each type and size provided for each control panel.
 6. Provide Ferraz-Shawmut type GGM, or approved equal.
- K. Selector Switches (407800.S01).
 1. Selector switches shall be provided as shown on the drawings.
 2. Selector switches shall be of round construction with rotary operators.
 3. Selector switches operation shall be to maintain the position turned to unless shown otherwise on the Drawings.
 4. Selector switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
 5. Selector switch contacts shall be rated at 10 Amps.
 6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.
- L. Pushbutton Switch (407800.S02).
 1. Pushbutton switches shall be provided as shown on the drawings.
 2. Pushbutton switches shall be of round construction with push or push-pull operators.
 3. Pushbutton switch operation shall be momentary or maintained as shown on the Drawings.
 4. Pushbutton switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
 5. Pushbutton switch contacts shall be rated at 10 Amps.
 6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

M. Key Switches (407800.S03).

1. Key switches shall be provided as shown on the drawings.
2. Key switches shall be of round construction with rotary operators.
3. Key switches operation shall be to maintain the position turned to unless shown otherwise on the Drawings.
4. Key switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
5. Key switch contacts shall be rated at 10 Amps.
6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

N. Mushroom Style Pushbutton Switch (407800.S04).

1. Mushroom Style Pushbutton switches shall be provided as shown on the drawings.
2. Mushroom Style Pushbutton switches shall be of round construction with push or push-pull operators.
3. Mushroom Style Pushbutton switch operation shall be momentary or maintained as shown on the Drawings.
4. Mushroom Style Pushbutton switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
5. Mushroom Style Pushbutton switch contacts shall be rated at 10 Amps.
6. Mushroom Style Pushbutton switches for Emergency Stop and other emergency switches (e.g., Help Me switches) shall be: provided with a red mushroom head; pull to reset; provided with N/C (failsafe) contacts; and shall be non-illuminated.
7. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

O. Indicator Lights (407800.L20).

1. Indicator lights shall be provided as shown on the drawings.
2. Indicator lights shall be of round construction.
3. Indicator lights shall have a built in push-to-test function.
4. Indicator light operation shall be as shown on the Drawings.
5. Indicator light lens colors shall be as shown on the Drawings.
6. Indicator lights shall be provided with high visibility LED lamps with transformers for circuit voltages over 24 VAC/DC, and high visibility LED lamps without transformers for circuits 24 VAC/DC and below.
7. Indicator light contacts shall be rated at 10 Amps.
8. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

- P. Speed Setpoint Potentiometer (407800.P20).
1. Speed potentiometers shall be provided as shown on the Drawings.
 2. Speed potentiometers shall be of round construction.
 3. Speed potentiometers operation shall be as shown on the Drawings.
 4. Speed potentiometers shall be 10k-ohm.
 5. Provide Allen-Bradley 800H-UR29, or approved equal.
- Q. Terminal Strip Identification Block (407800.T15).
1. Provide a terminal strip identification block with a machine generated label to match those shown on the Drawings.
 2. Provide a Phoenix Contact marker carrier model number UBE/D, or approved equal.
- R. Low Current Terminal Blocks (407800.T10).
1. Low current terminal blocks shall be provided as shown on the Drawings and in all panels requiring low current field terminations. Provide accessories as required and as shown including, but not limited to end anchors, end barriers, bridge jumpers, terminal strip pre-printed markers and snap-in pre-printed terminal block markers.
 2. Low current terminal blocks shall be used for electrical circuits rated at or less than 30 amps.
 3. Low current terminal blocks shall mount on DIN rail.
 4. Low current terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
 5. Low current terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
 6. Low current terminal blocks shall be grey in color.
 7. Low current terminal blocks shall be UL rated for up to 30 amps at 600 VAC.
 8. Low current terminal blocks shall accept wires from 24 to 10 AWG for single conductor per termination.
 9. Provide Phoenix Contact model UK5N, or approved equal.
- S. Grounding Terminal Blocks (407800.T60).
1. Grounding terminal blocks shall be provided as shown on the Drawings and in all panels requiring field terminations.
 2. Grounding terminal blocks shall be used for electrical circuits rated at or less than 30 amps.
 3. Grounding terminal blocks shall mount on DIN rail.
 4. Grounding terminal blocks shall be UL rated for a maximum of 30 amps and 600 VAC and to accept wires from 26 to 10 AWG for single conductor per termination.

5. Grounding terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
 6. Low current terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
 7. Grounding terminal blocks shall be green / yellow in color.
 8. Provide Phoenix Contact model USLKG5, or approved equal.
- T. Fusible DC Terminal Blocks (407800.T30).
1. Fusible DC terminal blocks shall be provided for 24 VDC control circuits as shown on the Drawings.
 2. Fusible DC terminal blocks shall be rated for use in electrical control circuits rated 6.3 amps or less and 15-30 VAC/DC.
 3. Fusible DC terminal blocks shall mount on DIN rail.
 4. Fusible DC terminal blocks shall accept 5 mm by 20, 25 or 30 mm fuses and use LED type blown fuse indicators.
 5. Fusible DC terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
 6. Fusible DC terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
 7. Fusible DC terminal blocks shall be black in color.
 8. Provide Phoenix Contact model UK5 HESILED 24, or approved equal.
- U. Fusible AC Terminal Blocks (407800.T35).
1. Fusible AC terminal blocks shall be provided for 120 VAC control circuits as shown on the Drawings.
 2. Fusible AC terminal blocks shall be rated for use in electrical control circuits rated 6.3 amps or less and 110-250 VAC/DC.
 3. Fusible AC terminal blocks shall mount on DIN rail.
 4. Fusible terminal blocks shall accept 5 mm by 20, 25 or 30 mm fuses and use neon blown fuse indicators.
 5. Fusible AC terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
 6. Fusible AC terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
 7. Fusible AC terminal blocks shall be black in color.
 8. Provide Phoenix Contact model UK5 HESILA 250, or approved equal.
- V. Wire Identification Labels (407800.L02).
1. Wire identification labels shall be provided for all conductors within control panels and control centers.

2. Wire identification labels shall be machine printed, non-adhesive, wire marker heat shrink sleeves with identification numbers that match the approved submittals.
3. Wire identification labels shall be properly sized for the conductor or cable and shall be white with black characters.
4. Provide Brady, Panduit, or approved equal.

W. Power Supply (407800.P02).

1. Power Supplies shall be provided as shown on the Drawings.
2. Power supplies shall operate on 85 to 264V AC / 45 to 65 Hz.
3. Power supplies shall withstand 300V AC short term voltage input.
4. Power supplies shall be rated for 500,000 hours MTBF, minimum.
5. Power supplies shall be rated for less than 15A inrush surge current.
6. Power supplies shall include an internal slow-blow fuse.
7. Power supplies shall include integrated varistors-based transient surge protection.
8. Power supplies shall be adjustable from 22.5 to 29.5V DC output.
9. Power supplies shall be rated for 5A DC output between -25 and 55 degrees Celsius.
10. Power supplies shall be capable of being connected in parallel for increased capacity.
11. Power supplies shall be current limited to 10A short circuit.
12. Power supplies shall be rated for less than 40mV phase to phase residual ripple.
13. Power supplies shall be rated for 3W power loss when idling.
14. Power supplies shall be rated for 14W power loss under nominal maximum load.
15. Power supplies shall include an LED to indicate DC power active.
16. Power supplies shall include a relay contact to indicate DC power active.
17. Power supplies shall be rated at 90% efficient, minimum.
18. Power supplies shall be designed for DIN rail mounting.
19. Power supplies shall be UL508 listed.
20. Provide Phoenix Contact model 2866750 QUINT-PS1/AC24/DC5, or approved equal.

X. Transient Voltage Surge Suppressors (407800.V10).

1. Transient voltage surge suppressors shall be provided as shown on the Drawings.
2. Transient voltage surge suppressors shall be capable of continuously sustaining a minimum of 20 amp for connected loads, operating from 120 VAC power with a line frequency between 47-63 Hz.

3. Transient voltage surge suppressors shall have a UL 1449 Suppressor Classification of 400 VAC for normal/common mode noise suppression.
 4. Transient voltage surge suppressors shall include L-N, L-L, L-G and N-G modes of suppression, with noise attenuation of 50dB minimum for normal mode and 40dB minimum for common mode and a peak surge capability of 25kA.
 5. Transient voltage surge suppressors shall have a green status LED as well as form C contacts for operating status indication and alarming.
 6. Transient voltage surge suppressors shall mount on DIN rail.
 7. Provide Sola model STV25K-10S, or approved equal.
- Y. Narrow Slot Wire Ducts (Narrow Slot) (407800.W21).
1. Wire ducts shall be provided as shown on the Drawings.
 2. Wire ducts shall be large enough to provide a wire fill area no more than 40 percent of the total cross sectional area of the wire ducts.
 3. Wire ducts shall be attached to the back panel with screws or plastic fasteners that are approved for use with, and provided by the wire duct manufacturer.
 4. Wire ducts shall not be attached to back panel or enclosure side surfaces with glue, tape, or other such adhesives.
 5. Wire ducts shall be white in color.
 6. Wire ducts shall have slotted sides.
 7. Wire ducts shall be provided with removable covers.
 8. Provide Panduit Type F, Thomas & Betts Type NPW, or approved equal.
- Z. Noise Shield (407800.N20).
1. Noise shields shall be provided as shown on the Drawings.
 2. Noise shields shall be designed to provide up to 20 dB reduction in noise, equivalent to six-inch air spacing.
 3. Noise shields shall be provided with bonding clips to allow mounting inside wire ducts.
 4. Noise shield height shall match the wire duct height.
 5. Noise shields shall be perforated and pre-scored.
 6. Noise shields shall include vertical wall slots and horizontal cable tie slots.
 7. Noise shields shall be zinc plated on all horizontal (contact) surfaces and black powder coated on all vertical surfaces.
 8. Noise shields shall be attached to the backpanel with screws or plastic fasteners that are approved for the use and provided by the wire duct manufacturer.
 9. Provide Panduit model SD(_)EMI, or approved equal.

AA. Spiral Wrap (407800.W30).

1. Spiral wrap shall be provided as shown on the Drawings and for all conductor and cable wire assemblies that cross hinged connections.
2. Spiral wrap shall be sized per the manufacturer's instructions.
3. Spiral wrapped assemblies shall include a strain relieving loop at each hinge crossing, with a minimum 6 inch vertical height, to minimize flexing of the wires in the conductor and cable assemblies.
4. Provide Panduit, Thomas & Betts, or approved equal.

BB. Cable Ties (407800.W40).

1. Cable Ties shall be provided as required for organizing and arranging conductors within boxes, control panels, and control centers.
2. Cable ties shall be UV resistant.
3. Cable ties shall be black in color.
4. Cable ties shall be installed using a tool from the cable tie manufacturer and specifically intended for use with the cable ties provided.
5. Provide Panduit, Thomas & Betts, or approved equal.

CC. DIN Mounting Rail (407800.D10).

1. DIN Mounting Rail shall be provided as shown on the Drawings and in all panels requiring DIN mounting rail.
2. DIN mounting rails shall be made of steel, galvanized, and yellow chromated.
3. Provide Phoenix Contact model NS 35/7.5, Allen-Bradley model 199-DR1, or approved equal.

DD. Ground Bars (407800.G06).

1. Ground bars shall be provided as shown on the Drawings.
2. Ground bars shall be low profile, "bus" type with set screw or pressure type connections and all copper construction.
3. Ground bars shall include sufficient termination points to accommodate all equipment grounding conductors as shown on the Drawings.
4. Ground bars shall include spare termination points to accommodate twenty (20) additional conductors sized, #14 through #8 AWG.
5. Provide Cutler-Hammer model GBK21, GE model TKG42, Square D model PK27GTA, or approved equal.

EE. Heavy Duty End Bracket (407800.A61).

1. Provide heavy duty end brackets on DIN rails as indicated on the Drawings.
2. Heavy duty end brackets shall be suitable for 35 mm DIN rails.
3. End brackets shall be screw-on style.
4. Provide Phoenix E/AL-NS 35 series or approved equal.

FF. Category 6 Ethernet Patch Cable (407800.C90).

1. Category 6 Ethernet patch cable shall be provided for all Ethernet/IP networked devices.
2. Category 6 Ethernet patch cable shall be suitable for use as Industrial Ethernet Cable, 100BaseTX.
3. Category 6 Ethernet patch cable shall be rated for use in a temperature range between -10 degrees C and 60 degrees C.
4. Category 6 Ethernet patch cable shall be rated for outdoor use.
5. Category 6 Ethernet patch cable shall be rated for 300 volts maximum.
6. Category 6 Ethernet patch cable conductors shall be 4-pair, solid copper, 24 AWG.
7. Category Ethernet patch cable conductor pairs shall be bonded.
8. Category 6 Ethernet patch cable insulation material shall be Polyolefin.
9. Category 6 Ethernet patch cable insulation color shall be blue.
10. Category 6 Ethernet patch cable shall be provided with aluminum foil polyester tape shield with 100% insulation coverage.
11. Category 6 Ethernet patch cable outer jacket material shall be PVC. Jacket material shall be sunlight and oil resistant. Jacket shall have sequential markings at two foot intervals.
12. Category 6 Ethernet patch cable shall be provided with RJ45 plugs, suitable for IP20 applications.
13. Category Ethernet patch cable shall be Belden Data Tuff Industrial Ethernet Cord Set E505 Series, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLERS

- A. All identification labeling shall be in compliance with Section 46 76 27 and all other project specifications.
- B. CONTRACTOR shall install and connect junction boxes and control panels and to field devices as shown on the Drawings.
- C. For all conductors terminating on terminal strips, install crimp-on, insulated plastic sleeve ferrules on each wire. Install ferrules with a crimping tool provided by the ferrule manufacturer for that purpose.
- D. Individual conductors and cables shall be grouped together and routed through plastic wire ducts mounted on the backpanel surface.
- E. Bond each enclosure back-panel to the grounding electrode system with a # 8 AWG copper conductor.
- F. Where conductors and cables are routed in boxes or enclosures, they shall be neatly bundled with cable ties at intervals not to exceed 12 inches on center. The tension for the cable ties shall be set with a tool specifically made for this purpose and of the same

manufacturer as the cable tie. Side cutters or other type tools shall not be used to cut the tail end of the cable tie. The CONTRACTOR shall only use the tool specifically made for this purpose and designed for use with the cable ties provided.

3.02 SOURCE QUALITY CONTROL

A. Tests and Inspections

1. All equipment shall be tested prior to site delivery. All equipment shall be field tested prior to commissioning. CONTRACTOR shall notify the ENGINEER 14 days prior to commencement of field testing.
2. CONTRACTOR-developed test forms shall accompany the notification of testing.
 - a. Test forms shall list all field connections at terminal strips and all internal logic circuits, along with the method planned for simulation of field conditions to test these connections and circuits.
3. All analog instrument loops shall be tested using an analog signal generator by applying the appropriate control signal to the field termination terminal strip.
 - a. At a minimum, analog instrument tests shall be made at 0%, 25%, 50%, 75%, and 100% of maximum control signal.
 - b. Additional analog instrument tests shall be made as appropriate.
4. All digital control circuits shall be tested by: applying the appropriate control voltage to the field termination terminal strip when externally supplied; using a jumper at the field termination terminal strip when internally supplied; or, if applicable, at an internal panel connection point when field terminations are not used.

B. Verification of Performance

1. Device functions shall be observed by the ENGINEER, to determine satisfactory operation of the device and connected circuit continuity, prior to shipment.

3.03 FIELD QUALITY CONTROL

A. Site Tests, Inspection

1. CONTRACTOR shall install, calibrate and test, all systems prior to notifying ENGINEER of witness testing verification.
2. The ENGINEER shall systematically verify the process control system is operating as designed. The CONTRACTOR shall perform the tasks necessary to confirm proper operation to the ENGINEER.

END OF SECTION

SECTION 41 12 13

SHAFTLESS SCREW CONVEYORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Description
 - 1. Shaftless screw conveyors and associated appurtenances for the transport of dewatered biosolids.
- B. Equipment Numbers
 - 1. Inclined Conveyor: Tag No. CON-250-03
 - 2. Horizontal Conveyor: Tag No. CON-250-04

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 66 00 – Materials and Equipment
 - 3. Section 01 78 23 – Operation and Maintenance Data
 - 4. Section 01 79 00 – Training
 - 5. Section 01 81 00 – Equipment and System Testing
 - 6. Section 01 99 00 – Reference Forms
 - 7. Section 05 50 01 – Anchor Bolts and Anchoring Devices
 - 8. Section 09 96 00 – High Performance Coatings
 - 9. Section 11 05 13 – Electric Motors
 - 10. Section 46 05 13 – General Requirement for Equipment
 - 11. Section 46 05 14– Equipment Mounting
 - 12. Section 46 76 27 – Screw Press Dewatering Equipment

1.03 SUBMITTALS

- A. Comply with Section 01 33 00 and submit the following.
- B. General arrangement drawings showing the entire assembly. Include a materials list and descriptions of all major components such as all gears and support structure.
- C. Descriptive literature and/or catalogs of the equipment, including a detailed equipment specification.
- D. A list of at least 20 installations of similar size that have been operating successfully for at least five years in municipal wastewater treatment plants.

- E. Spiral strength calculations for spring (spiral) compression and elongation.
- F. Conveyor torque calculations stamped by a registered engineer.
- G. Torque calculations for the gear reducer and reducer motor.
- H. Motor data submittal in accordance with Section 11 05 13.
- I. Equipment mounting submittal information specified in Section 46 05 14.
- J. Anchor bolt design calculations and details in accordance with Section 05 50 01.
- K. Applicable operation and maintenance information specified in Section 01 78 23.
- L. Complete and submit the following forms from Section 01 99 00:
 - 1. Motor Data Form.
 - 2. Unit Responsibility Form.
 - 3. Additional forms required during startup per Part 3.

1.04 QUALITY ASSURANCE

- A. Unit Responsibility
 - 1. Provide unit responsibility for the equipment included in this section.
- B. Coordination
 - 1. Coordinate the shaftless screw conveyor design and installation requirements with the biosolids dewatering equipment manufacturer.
- C. Experience
 - 1. A minimum of not less than 10 years experience in the design and manufacture of shaftless screw conveyor systems.
 - 2. At least 20 shaftless screw conveyor systems operating successfully for at least five (5) years at municipal wastewater treatment plants.

1.05 PRODUCT SHIPMENT, PROTECTION, AND STORAGE

- A. Comply with Section 01 66 00.
- B. Site Storage and Handling of Equipment.
 - 1. Store the supplied equipment in accordance with the manufacturer's recommendations and instruction.
 - 2. Store gear reducers and motors in buildings or trailers which have concrete or wooden floor, a roof and fully enclosed walls, and will protect the equipment from dust, dirt, and moisture.
 - 3. Take responsibility for work, equipment, and materials until inspected, tested and finally accepted.

1.06 PROJECT CONDITIONS

- A. Install equipment in an outdoor, canopy covered location at the biosolids dewatering facility, as shown on the Drawings. The majority of the inclined conveyor will not be covered by a canopy and will be continuously exposed to the elements.

1.07 WARRANTY

- A. Warranty Against Wear
1. Warrant the liner and spiral against excessive wear for a period of three years following plant start-up.
 2. Liner:
 - a. Excessive wear is indicated by the appearance of the bottom indicator layer (second color) along more than 30 percent of the conveyor length.
 - b. If excessive wear occurs within the warranty period, provide new formed and banded liner to replace all the liner in the conveyor that has excessive wear.
 3. Screw
 - a. Excessive wear is indicated by loss of more than 50 percent of the height of the main outer screw section over 30 percent of the screw length.
 - b. If excessive wear occurs within the warranty period, provide new screw to replace the screw in the conveyor that has excessive wear.
 4. Complete the Extended Warranty Form in Section 01 99 00. Modify the Extended Warranty Form to apply just for the warranty against wear specified above.

1.08 PERFORMANCE REQUIREMENTS

Performance Requirement	Value
Design Capacity of Inclined Conveyor, cubic feet/hour	100
Design Capacity of Horizontal Conveyor, cubic feet/hour	100
⁽¹⁾ Size the conveyor trough the future condition. Design the motor to meet the design capacity. Provide the capability to replace the motor and reducer to meet the future capacity requirements of the horizontal conveyor.	

1.09 DESIGN REQUIREMENTS

- A. Provide shaftless screw conveyor. Screw conveyor with shaft and intermediate hangers are not acceptable.
- B. Design motor and gear reducer to be removable without disassembly of conveyor.

C. Design requirements for the inclined conveyor are as follows:

Inclined Conveyor Design Requirement	Value
Material conveyed	Dewatered Digested Sludge
Approx. density of sludge, lbs/ft ³	70
Maximum screw speed, rpm	20
Maximum trough fill rate @ design load, %	45
Approx. length, ft. (centerline of dewatered cake discharge chute to centerline of furthest conveyor discharge chute)	22'-5" ⁽¹⁾
Number of inlets	1
Feed inlet from	Screw Press Discharge Box
No. of discharges	2
Discharge to	Horizontal Conveyor
Discharge through	Discharge Chute
Discharge type	Axial
Location of drive	Pulling
Angle, degrees from horizontal	23
⁽¹⁾ Verify dimensions with drawings.	

D. Design requirements for the horizontal conveyor are as follows:

Inclined Conveyor Design Requirement	Value
Material conveyed	Dewatered Digested Sludge
Approx. density of sludge, lbs/ft ³	70
Maximum screw speed, rpm	20
Maximum trough fill rate @ design load, %	45
Approx. length, ft. (centerline of inlet chute to centerline of discharge chute)	9'-4"
Number of inlets	1
Feed inlet from	Inclined Conveyor Discharge Chute
No. of discharges	1
Discharge to	Dumpster
Discharge through	Discharge Chute
Discharge type	Axial
Location of drive	Pulling
⁽²⁾ Verify dimensions with drawings.	

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. One of the following:
1. FKC Co. Ltd.
 2. Or equal, as defined in Section 01300

2.02 MATERIALS

- A. Table 1: Conveyor Component Material Requirements

Component	Material
Chutes, Troughs, End Plates, Covers, Supports	Type 304 stainless steel
Drive Shaft	1045 Steel
Spiral Flighting	Special Chrome-Alloy Steel w/min 225 Brinnell Hardness
Wear Liner	UHMW Polyethylene ⁽¹⁾
Anchor bolts and other fastening hardware	ANSI, Type 304 stainless steel
⁽¹⁾ See Table 2 for specific material properties for the wear liner.	

- B. Table 2: Wear Liner Material Properties

Property	Value/Unit	Testing Method
Density	61.2 lbs/ft ³	DIN53479
Molecular Weight	9.2 x 10 ⁶	Margolies
Ball Indentation Hardness	5,946 lbs/in ²	DIN53456
Shore Hardness D	64	DIN53505
Crystalline Melting Range	278°F	
Dynamic Coefficient of Friction	0.1-0.12 ratio of tension/load	Plastic to Steel

2.03 FABRICATION

- A. Minimum thickness for steel items
1. Trough lids: 10 gauge.
 2. All other components: 10 gauge.
- B. Shop welding
1. Comply with Structural Welding code, AWS D1.1, of the American Welding Society.
 2. For all welded connections, develop the full strength of the connected elements.

2.04 MECHANICAL COMPONENTS

A. Spiral Flighting

1. Spiral flighting designed to convey material without a center shaft or hanger bearings.
2. Construct spiral flights of cold-formed high strength chrome alloy steel with a minimum hardness of 220 Brinnell. Provide spiral flights with adequate stability to prevent distortion and jumping in the trough.
3. Provide a second, inner spiral, concentric with the outside spiral.
4. Provide the auger flighting with a torsional rating that exceeds the torque rating of the drive motor at 150% of its nameplate horsepower.
5. Limit the "spring effect" of the spiral to 1.0 mm per 100 mm of length at maximum load conditions.
6. Provide a minimum outer spiral thickness of 0.75 inches for spiral diameters up to 9 inches and 1 inch for spirals diameters exceeding 9 inches.
7. Form the spiral flighting in sections from one continuous flat bar that is concentric within a tolerance of 2 mm. Sectional flighting formed from plate is not permitted.
8. Provide full penetration welds at all splice connections.
9. Couple the spiral flights to the end shaft by a flanged, bolted connection.

B. Drive System

1. SEW Eurodrive FAF enhanced screw conveyor drive with four individual sealing areas.
2. Or equal

C. Horizontal and Inclined Troughs

1. Provide U-shaped troughs.
2. Provide inclined conveyor with a 2-inch flanged drain outlet to facilitate cleaning. Pipe the drain outlet to the drain as shown on the drawings. Provide drains with 1-inch flushing connections.
3. Equip the inclined trough with an inlet opening to interconnect with the screw press dewatering unit. Coordinate the opening size with the screw press manufacturer. Flange the openings to provide for a suitable interconnection between the two pieces of equipment.
4. Provide bolted covers on all portions of each trough that is not covered by the filling chutes. Provide covers with a maximum five (5) foot length. To prevent unsafe access to the conveyors, quick opening covers will not be allowed unless they are also bolted to prevent access during operation. Provide each conveyor with the appropriate warning labels to call for lock out – tag out of the electrical system before the covers are removed. Provide one inspection hatch with finger guards on each of the two conveyors.

D. Wear Liner

1. Line the inside trough surfaces of the conveyors with a layer of ultra high molecular weight polyethylene (UHMW-PE). Provide liner by SPIRAC Duraflo SPX, or Xylethon by Durawear, Polystone M or equal.
2. Provide a single piece liner that is formed and bonded with two (2) layers of the same material, each of a different color, to provide a visible indication when the liner is nearing the end of its useful life.
3. Single color liner is acceptable if manufacturer provides ultrasonic thickener tester for testing liner thickness (Yanmis Thickens Gauge, GM100, ½-220 mm digital thickness tester or equal).
4. Provide liner sections that are a maximum length of four (4) feet.
5. Provide stainless steel clips to hold the liner in place. Fasteners are not allowed.
6. Provide a liner with a minimum thickness of 1/2" for spirals up to 14" diameter and a minimum thickness of 5/8" for larger spirals.
7. Proprietary hold-down guide liners mounted under the lids are acceptable as long as they do not interfere with the flow of sludge. Steel hold down bars are prohibited.

E. Conveyor Supports

1. Provide conveyor with supports suitable for mounting conveyors as shown on the drawings.
2. At a minimum, provide the inclined conveyor with supports at the inlet end and at the storage facility wall, with intermediate supports as required.
3. Provide Type 304 stainless steel structural angle supports with a thickness of minimum 0.25".
4. Shop fabricate supports from structural steel shapes and plates. Assemble and fit supports to the conveyor prior to delivery to the jobsite. Match mark supports and conveyor segments for easy Contractor installation.
5. Allow for 1-1/2 inch of grout beneath each support foot pad for the Contractor to compensate for uneven floor elevation.
6. Coordinate with dewatering equipment manufacturer to ensure that the supports avoid interference with other equipment or equipment supports.

F. Drive Units

1. Provide each spiral conveyor with a constant-speed gear reducer motor drive unit. Mount the drive unit to a bellhousing adapter flange that is mounted to the end plate of the conveyor.
2. Design the adapter flange to allow the leakage from inside the conveyor trough to atmosphere rather than into the gear reducer/motor drive unit. Direct coupling of the gear reducer/motor drive unit to the end flange of the conveyor is not acceptable.

3. Design the drive unit to be rigidly supported to prevent any visible vibration.
 4. Design the drive system to start the conveyor with the trough filled at two times the design load for loads designed up to 67 percent fill rate, and 1.5 times for loads designed exceeding 67 percent fill rate.
- G. Motors
1. Comply with Section 11 05 13, except as modified herein.
 2. Type 2, constant speed.
 3. Motor Sizes:
 - a. Inclined conveyor: maximum 5.0 horsepower
 4. Power Requirements: 480 volt, 3-phase, 60 Hertz.
 5. Minimum Service Factor: 1.15
 6. Nominal Speed: maximum 1,800 rpm
- H. Gear Reducers
1. Provide AGMA Class II gears with single or double reduction.
 2. Provide helical gear units with high capacity roller bearings. Design bearings with thrust loads for a fully loaded startup condition.
 3. Provide bearings with an ABMA L-10 life of 100,000 hours.
 4. Design the reducer to be air-cooled with no auxiliary cooling requirement.
 5. Size the gear reducer with a torque service factor of 1.5 times the absorbed power or 1.1 times the motor nameplate (at the driven shaft speed), whichever is greater.
- I. Chutes and Discharge Boots
1. Furnish inlet and discharge chutes of the same gauge and construction material as the conveyor troughs, at locations as shown on the drawings. Provide minimum 10 gauge thick flanges.
 2. Furnish single-ply flanged discharge boots at locations and lengths shown on the drawings. Construct flexible boots of EPDM rubber hose, neoprene, Linatrilite by Linatex Corporation, or approved equal.
- J. Electrical Equipment
1. Provide electrical equipment that conforms to the applicable standard of the National Electrical Manufacturers Association (NEMA) and the National Electrical Code (NEC).
 2. Motion Failure Alarm Unit
 - a. Provide an external conveyor mounted motion failure alarm, (alternately known as "zero speed" or "under-speed" switch) to detect spiral or drive shaft failure (one for each conveyor). Provide with a NEMA 4 enclosure.
 - b. Switch shall interface to the plant control system with 120 VAC rated dry contact or 120 VAC pulse output proximity switch.

3. Emergency Shutdown:
 - a. Provide an emergency trip cord and safety switch for each conveyor and for the motorized pivot mechanism. Run the cord the full length of each conveyor. Design the trip switch to immediately stop all conveyors and the motorized pivot mechanism when the switch is actuated. The switch shall be RS type by Conveyor Components Corporation or approved equal.
4. Electrical Controls
 - a. Except as specified above, electrical controls for the shaftless conveying equipment furnished under this section will be provided by others, as part of the control panel(s) for the screw press dewatering equipment being furnished under Section 46 76 27.

2.05 ACCESSORIES

- A. Anchor Bolts
 1. Comply with Section 05 50 01.
 2. Calculations are required.
 3. Minimum diameter: 1/2".
- B. Spare Parts
 1. One (1) packing gland set, for each conveyor supplied
 2. Comply with Section 46 05 13.
- C. Lubricants
 1. Furnish lubricants of the type and quantity as recommended by the conveyor manufacturer for (start-up) operation.

2.06 FACTORY COATING

- A. Furnish gear reducers and motors with the manufacturer's standard paint system.
- B. Stainless Steel
 1. Clean with mild abrasive wheels and/or nonferrous blast media to remove heavy scale and welding carbon. It is also acceptable to passivate with stainless steel cleaner and then rinse.
- C. Iron and Mild Steel
 1. Dry abrasive blast all iron and mild steel in accordance with SSPC-SP6 and Section 09 96 00. Paint surfaces within 24 hours to prevent rusting and surface discoloration.
 2. Paint surfaces per Section 09 96 00 (with exception of spiral).
 3. Provide spiral with one coat of shop primer.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Align, connect, and install equipment in accordance with the manufacturer's written instructions.
- B. Ensure true alignment of spiral flights during installation.
- C. Trial fit and match-mark mating parts in the factory to ensure field assembly is possible.
- D. Provide factory-trained personnel to check installation and test initial operation.
- E. Certify installation and initial operation of all components on the appropriate forms included in Section 01 99 00.

3.02 FIELD QUALITY CONTROL

- A. Field quality control and inspections will be performed as specified in Section 01 81 00.
- B. Corrective Actions: Replace or repair work to eliminate defects, deficiencies and irregularities.

3.03 MANUFACTURER'S FIELD SERVICES

- A. Provide field inspection and instruction services by factory-trained service technician of the manufacturer as specified in Sections 01 79 00 and 01 81 00. Services by a sales representative are not acceptable.
 - 1. Provide minimum 1 visit of 8 hours, excluding travel time, to inspect and test initial operation.
 - 2. Provide minimum 1 visit of 4 hours, excluding travel time, to train plant operators.
- B. Submit completed Manufacturer's Installation Certifications (Section 01 99 00).
- C. Submit Manufacturer's Instruction Certification (Section 01 99 00).

3.04 PERFORMANCE TESTING

- A. Comply with Section 01 81 00.
- B. Torque Testing
 - 1. Operate conveyor under full load to ensure that torque design requirements are met.

3.05 DEMONSTRATION

- A. Comply with Section 01 81 00.

END OF SECTION

SECTION 46 05 13

GENERAL REQUIREMENTS FOR EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. General requirements applicable to mechanical equipment and systems.
- B. Ensure mechanical equipment meets the requirements of this Section in addition to the specific requirements of the individual equipment specification Sections.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 61 11 – Seismic Anchorage and Bracing
 - 3. Section 01 78 23 – Operation and Maintenance Data
 - 4. Section 01 81 00 – Equipment and System Testing
 - 5. Section 01 99 90 – Reference Forms
 - 6. Section 09 96 00 – High Performance Coatings

1.03 GENERAL REQUIREMENTS

- A. Equipment shall be of new construction and comply with the following requirements:
 - 1. Designed for stresses that may occur during fabrication, transportation, erection, and during continuous or intermittent operations.
 - 2. Adequately anchored, leveled, aligned, and ready for operation without binding or overloading of critical components or motors.
 - 3. Installed with necessary appurtenances required for proper operation and installation in a neat and workmanlike manner.
 - 4. Tested by factory trained service mechanics or engineers.

1.04 UNIT RESPONSIBILITY

- A. Equipment systems shall be assembled as a unit by a single manufacturer responsible for the entire unit.
 - 1. Responsibility extends to selecting components of the system to assure compatibility, proper operation, and compliance with specified performance requirements.
 - 2. Unit responsibility does not relieve Contractor of responsibility to Owner for performance of the Work.

1.05 QUALITY ASSURANCE

A. Arrangement

1. The arrangement of equipment shown on the Drawings is based upon information available at the time of design and is not intended to show exact dimensions peculiar to a specific manufacturer.
2. Some features of the illustrated equipment installation may require revision to meet actual equipment installation requirements.
3. Structural supports, foundations, connected piping, and valves shown may have to be altered to accommodate the equipment provided. Additional payment will not be made for such revisions and alterations.

1.06 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. General: Provide separate submittals for each equipment item or group of related equipment items.
- C. Equipment Anchorage: Submit anchor bolt sizing calculations.
- D. Bearing Life Calculations: Submit bearing L-10 life calculations in accordance with ABMA requirements.

1.07 OPERATION AND MAINTENANCE MANUALS

- A. Furnish operation and maintenance manuals for each equipment system in accordance with the Section 01 78 23 requirements.

1.08 PROTECTION DURING SHIPMENT

- A. Shipping: Ship equipment in sealed, weather-tight, enclosed conveyances, and protected against damaging stresses during transport and handling.
- B. Bearing Housings: Wrap or otherwise seal to prevent contamination by grit and dirt, and tape closed ventilation and other types of openings.
- C. Repair any damaged materials to conform to the requirements of the Contract before the assembly is incorporated into the Work. The Contractor shall bear the costs arising out of dismantling, inspection, repair, and reassembly.

PART 2 - PRODUCTS

2.01 PIPING CONNECTIONS ON EQUIPMENT

- A. Flanges on Equipment: Conform to dimensions and drilling specified in ANSI B16.1, Class 125 unless otherwise required by Division 40 pipe specifications or the Drawings.
- B. Pipe Flanges: Conform to dimensions and drilling specified in AWWA C207, Class D, 125 lb flanges provided on connection pipe.
- C. Threaded Flanges: Flat faced with standard taper pipe thread conforming to ANSI B1.20.1.

- D. Pipe Threads: Conform in dimension and limits of size to ANSI B1.1, coarse thread series, Class 2 fit.
- E. Flange Assembly Bolts and Nuts
 - 1. Heavy pattern, hexagonal head, stainless steel machine bolts with heavy pattern, hot pressed, hexagonal nuts conforming to ANSI B18.2.1 and B18.2.2.
 - 2. Threads: Unified Screw Threads, Standard Coarse Thread Series, Class 2A and 2B, ANSI B1.1.

2.02 BEARINGS

- A. Service: Unless otherwise specified, equipment bearings shall be oil or grease lubricated, ball or roller type, designed to withstand the stresses of the service specified.
- B. Rating
 - 1. L-10 Rating Life: Minimum 50,000 hours unless otherwise specified. Determine rating life using the maximum equipment operating speed.
 - 2. Determine rating in accordance with the latest revisions of AFBMA Methods of Evaluating Load Ratings of Ball and Roller Bearings.
 - 3. Where individual equipment Sections specify higher bearing life ratings, those requirements supersede the minimum bearing life specified above.
- C. Grease Lubricated Bearings
 - 1. Fit with easily accessible grease supply, flush, drain and relief fittings, except those bearings specified to be factory sealed and lubricated.
 - 2. Extend non-accessible grease fittings to an easily accessible location using 1/4-inch diameter stainless steel tubing as an extension tube.
 - 3. Grease supply fittings: Standard hydraulic Alemite or Zerk type.
- D. Oil Lubricated Bearings
 - 1. Equip with either a pressure lubricating system or a separate oil reservoir type system.
 - 2. Size oil lubrication systems to safely absorb the heat energy normally generated in the bearing under a maximum ambient temperature of 60°C.
 - 3. Equip with a filler pipe and an external level indicator gage.
- E. Incorporate bearing housings with sufficient cooling to maintain surface temperature at 65 degrees C or less for continuous operation at bearing rated load and a 50 degrees C ambient temperature, or install appropriate shielding on bearings that are accessible to touch.

2.03 DRIVE COMPONENTS

- A. V-Belt Drives
 - 1. Design with sliding base or other suitable tension adjustment.
 - 2. Design with service factor of at least 1.6 at maximum speed.

3. Statically balance sheaves. In addition, dynamically balance sheaves that will operate at peripheral speed of more than 5,500 feet per minute.
 4. Belts: Provide anti-static belts when explosion-proof equipment or environment is specified.
- B. Gear Reducers
1. Provide drives with nominal input horsepower rating equal to or greater than the nameplate horsepower of the drive motor.
 2. Provide gear drives manufactured in accordance with AGMA Class II service requirements.
- 2.04 SHAFT COUPLINGS
- A. Type and Rating: Non-lubricated, designed for a minimum of 50,000 hours operating life.
- B. Equipment with a driver greater than 1/2 horsepower, and where the input shaft of a driven unit is directly connected to the output shaft of the driver, shall have its two shafts connected by a flexible coupling which can accommodate angular misalignment, parallel misalignment and end float, and which cushions shock loads and dampens torsional vibrations.
- C. Provide couplings recommended by the coupling manufacturer for the specific application, considering horsepower, speed of rotation, and type of service.
- D. Install couplings in conformance to the manufacturer's instructions.
- 2.05 GUARDS
- A. Guards
1. Enclose exposed moving parts with guards that meet the requirements of federal and state OSHA requirements.
- B. Materials
1. Fabricate guards of 14 gauge steel and expanded metal screen to provide visual inspection of moving parts without removal of the guard.
 2. Galvanize after fabrication and paint with the equipment.
 3. Fasteners: Type 304 stainless steel.
- 2.06 NAMEPLATES AND LIFTING EYES
- A. Nameplates
1. Provide on each item of equipment with the specified equipment name or abbreviation and equipment number.
 2. Engrave or stamp (not painted) on stainless steel and fastened to the equipment in an accessible location with stainless steel screws or drive pins.
- B. Lifting Eyes
1. Provide on equipment weighing over 80 lbs.

2.07 SPARE PARTS AND LUBRICANTS

- A. Spare Parts: Provide for each item of mechanical, electrical, and instrumentation equipment a supply of spare parts and special tools required for the starting, testing, adjustments, and initial operation. Pack spare parts required by individual equipment specifications:
 - 1. Pack spare parts with individual weights less than 50 pounds in a heavily constructed painted wood box with hinged cover and a locking clasp.
 - 2. Provide a typed inventory of spare parts stapled to the underside of the cover.
 - 3. Tag and wrap each part in a waterproof container. Spare bearings shall be encapsulated in an airtight plastic film.
- B. Lubricants: Provide for each item of mechanical equipment of the type recommended by the equipment manufacturer a supply of the lubricant for startup, testing, and initial operation.
 - 1. Provide a list showing the required lubricants for each item of mechanical equipment. List estimated quantity of lubricant needed for a full year's operation, assuming the equipment will operate continuously.
 - 2. Lubricants shall be products of the Owner's current lubricant supplier.
 - 3. Limit the various types of lubricants by consolidating them, with the equipment manufacturer's approval, into the least number of different types.

2.08 ANCHOR BOLTS

- A. Size anchor bolts and concrete anchors for equipment in accordance with Section 01 61 11.

2.09 FACTORY APPLIED COATINGS

- A. Ship each item of equipment to the site of the work with a shop applied prime coating prepared in accordance with the requirements of Section 09 96 00 and compatible with the finish coatings.
- B. Finish Painting of Motors: Factory-apply finish coats using manufacturer's standard coating, unless otherwise specified in Section 09 96 00.

2.10 SPECIAL TOOLS AND ACCESSORIES

- A. Furnish with each piece of equipment all tools, instruments, or accessories of a special nature that are required to assemble, disassemble, maintain, or repair any item of equipment.
 - 1. Tag and mark each piece indicating their service and the piece of equipment for which their use is intended.
 - 2. Include a list and description or pictorial representation of all special tools required for a given piece of equipment for insertion into the equipment operation and maintenance manual.

2.11 FASTENERS AND DIELECTRIC ISOLATION

- A. Fasteners for Aluminum: Stainless steel.
- B. Isolate steel surfaces, other than stainless steel, from aluminum with stainless steel, neoprene, non-metallic washers or other acceptable material.
- C. Dissimilar Metals: Protect from galvanic corrosion by means of pressure tapes, coatings, or isolators.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install, align, and test each item of equipment within the tolerances recommended by the equipment manufacturer.
- B. When specified in individual Sections, install and test equipment under the direction of installation engineers who have been factory trained by the equipment manufacturer.
- C. Perform all work in accordance with manufacturer's recommendations.

3.02 QUALITY CONTROL

- A. Test equipment in accordance with Section 01 81 00 and the individual equipment Section.
- B. Furnish written certification from the equipment manufacturers that each item has been installed, aligned, and tested correctly and that the installation meets the manufacturer's requirements for efficient, trouble-free operation. Utilize Manufacturer's Installation Certification Form provided in Section 01 99 90.
- C. Equipment manufacturer's certification shall not be construed as relieving the Contractor of his overall responsibility for this portion of the work.

END OF SECTION

SECTION 46 05 14

EQUIPMENT MOUNTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Equipment mounting requirements, including fabricated steel equipment bases, concrete equipment pads, supports, anchorage, and accessories.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
 - 1. Section 01 33 00 – Submittals
 - 2. Section 05 50 01 – Anchor Bolts and Anchoring Devices
 - 3. Section 09 96 00 – High Performance Coatings

1.03 QUALITY ASSURANCE

- A. Provide supports, anchorage, and equipment mounts that are sized and designed to resist the calculated forces and that are in accordance with the manufacturer's recommendations, the current International Building Code (IBC), and industry standards requirements.

1.04 DESIGN REQUIREMENTS

- A. Design equipment mounts and anchorages to resist the minimum lateral force required by the latest edition of the IBC, the manufacturer of the equipment, or a lateral seismic force of 60% of the operating weight of the equipment, whichever is greater.
- B. Equipment anchor bolt sizes shown on the Drawings are the minimum required size.
- C. Equipment anchorage design and calculations shall be prepared and signed by a civil or structural engineer currently registered in the state where equipment is installed.

1.05 MOUNTING REQUIREMENTS

- A. Mount equipment and driver on a common fabricated steel baseplate with ample rigidity to support equipment and maintain shaft alignment without excessive deflection.
- B. Mount equipment baseplates on concrete equipment pads.

1.06 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Shop Drawings: Provide drawings of equipment bases and anchorage details.
- C. Anchorage Calculations: Submit stamped and signed anchor bolt sizing calculations.

PART 2 - PRODUCTS

2.01 ANCHOR BOLTS AND CONCRETE ANCHORS

- A. Provide anchor bolts and concrete anchors in accordance with Section 05 50 01.

2.02 CONCRETE EQUIPMENT PADS

- A. Construct concrete pedestals at least 6 inches wider and longer than the steel or cast base so that the distance between the anchor bolts and the edge of concrete is at least 3 inches.
- B. Unless otherwise shown or specified, all conduits, piping connections, drains, etc. shall be enclosed by the concrete base.
- C. Shape concrete pedestals to drain away from the base.
- D. Allow concrete to cure 14 days or until the concrete has cured to 75 percent of its specified compressive strength before placing equipment on the concrete pedestal.
- E. Do not start equipment placed on the concrete pedestal until the concrete has cured for 28 days or to 100 percent of its specified compressive strength.

2.03 STRUCTURAL STEEL EQUIPMENT BASES

- A. Provide structural steel bases with thickened steel pads for doweling.
 - 1. Fabricate equipment base using continuous welds to seal seams and contact edges between steel members.
 - 2. Grind welds smooth.
- B. Design equipment bases with perimeter steel beams, intermediate stiffeners and baseplate.
 - 1. Provide perimeter steel beams with minimum depth equal to 1/10th of the longest dimension of the base.
 - 2. Beam depth need not exceed 14 inches provided that the baseplate deflection is kept within acceptable limits to minimize misalignment, as determined by the manufacturer.
- C. Provide grout holes for the bases of equipment where vibration isolation is not specified.
- D. Provide minimum 1-inch thick steel mounting baseplate for equipment with drivers 20 horsepower and larger.
- E. Shop-apply prime coat prepared in accordance with the requirements of Section 09 96 00 and compatible with the finish coatings

PART 3 - EXECUTION

3.01 GENERAL

- A. Connect piping to equipment with flexible connections and/or expansion joints such that the intended use of these joints is maintained in the piping system.

- B. Coordinate the location of electrical conduit and piping penetrations within the concrete pad and equipment base.
 - 1. Stub-up penetrations on the same side of the equipment as required for connection to the equipment.
 - 2. Locate equipment drains for proper drainage away from equipment.

3.02 EQUIPMENT MOUNTING

- A. Mount equipment on equipment baseplates using stainless steel shims so that equipment and driver are level in both directions and mounted within machined areas on baseplate. Do not use wedges to obtain level and alignment.
- B. Utilize templates for placement of anchor bolts prior to placing concrete for equipment pad.
- C. Apply a non-seize or non-galling compound on the threads of anchor bolts and concrete anchors.

3.03 SHAFT ALIGNMENT

- A. After the complete unit has been installed on the equipment pad and leveled, check the factory shaft alignment by disassembling coupling and measuring angular and parallel orientations.
- B. Use reverse-indicator dial or laser type alignment equipment to align shafts to within the manufacturer's required tolerance. Allow for thermal expansion, spacer coupling length and other factors that affect proper shaft alignment.

3.04 GROUTING EQUIPMENT BASED

- A. After alignment has been completed, tighten anchor bolts and grout between equipment base and equipment pad. Use non-shrink and non-ferrous grout no less than 7/8 inch and no more than 1-5/8-inches thick.
- B. Allow 48 hours for grout to harden and then remove jacking screws. Re-check torque on anchor bolts and re-check shaft alignment, making corrections as necessary.

END OF SECTION

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SECTION 46 33 33

POLYMER BLENDING UNITS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for a polymer blending and feed system to provide prepared polymer solution from a concentrated raw polymer supply.
- B. If required to meet the Project schedule, the polymer blending unit manufacturer may propose alternative components for consideration during bidding. The alternative components must be equal in quality and function to the components included in this specification. Alternative components must also be industry standard components and components that are typically used by the manufacturer.
- C. Equipment List

Location	Equipment No.
Biosolids Mechanical Dewatering Facility	POL-250-06

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
 - 1. Section 01 33 00 – Submittals
 - 2. Section 01 66 00 – Materials and Equipment
 - 3. Section 01 78 23 – Operation and Maintenance Data
 - 4. Section 01 81 00 – Equipment Startup and Testing
 - 5. Section 01 99 00 – Reference Forms
 - 6. Section 05 50 01 – Anchor Bolts and Anchoring Devices
 - 7. Section 09 96 00 – High Performance Coatings
 - 8. Section 11 05 13 – Electric Motors
 - 9. Section 46 05 13 – General Requirements for Equipment
 - 10. Section 46 05 14 – Equipment Mounting
 - 11. Section 46 76 27 – Screw Press Dewatering Equipment

1.03 COORDINATION

- A. Provide POL-250-06 to the dewatering equipment manufacturer for inclusion in the biosolids mechanical dewatering polymer system.
- B. Verify requirements for POL-250-06 with the dewatering equipment manufacturer.

1.04 DESIGN REQUIREMENTS

A. Criteria

1. Provide an integrated equipment package designed to automatically meter, activate, dilute with water, and feed high molecular weight liquid polymer.
2. Include: Mounting skid, neat polymer metering pump, mixing chamber, booster pump (if required by this specification), piping and fittings, integral control panel, connections to automatic controls, and all necessary appurtenances required for proper and efficient operation.
3. Design unit to discriminately apply high mixing energy to maximize polymer activation while preventing polymer jelling, agglomeration or damage to its molecular structure.
4. Design mixing chamber to maximize the dilution and dynamic activation of liquid polymer. Not acceptable: conventional static mixers or mixing blocks for primary polymer dilution or activation.
5. Do not expose polymer to a centrifugal pump impeller or other cause of excessive shear.
6. Provide progressing cavity polymer metering pump to convey concentrated polymer to mixing chamber.
7. Design all components which require periodic maintenance to be readily accessible.
8. Design unit for working pressure of 100 psi, except as noted below.
9. Electrical Equipment
 - a. Comply with standards or requirements of National Electrical Manufacturer Association (NEMA) and National Electrical Code (NEC).
 - b. Insulate both power and control equipment for 600V even though operating voltage may be lower.
10. Mount all components securely on a single Type 304 stainless steel frame.
11. Plant Water Supply
 - a. Water for cleaning sprays and polymer blending will be plant effluent (UW) filtered through a tertiary disk filter with nominal 10-micron opening and that may contain small quantities of biological floc and dilute concentrations of industrial solvents.
 - b. If additional filtration is required, provide a strainer at the water connection point.
12. The water pressure as it enters the dewatering building is expected to range from 60 to 80 lbs/in².
13. If additional pressure is required, provide a booster pump system to meet the pressure needs of the screw press system.

B. Performance

1. Conform to the following:

Equipment No.	POL-250-06
Dilution water capacity, gph	60 - 600
Polymer viscosity, centipoise	< 5,000
Diluted polymer concentration, percent	0.3 – 0.7
Downstream dilution required	No
Polymer feed pump	
Discharge capacity, required range, gph	0.25 – 5.0
Maximum discharge pressure, psig	65
Functional turndown range, minimum	20:1

1.05 SUBMITTALS

A. Comply with Section 01 33 00.

B. Include a copy of the contract document control diagrams and process and instrumentation diagrams, with addenda updates, that apply to the equipment in this section.

1. Mark to show specific changes necessary for the equipment proposed in the submittal.
2. If no changes are required, mark the drawing or drawings “No Changes Required”.
3. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

C. Include the following items:

1. Complete equipment list, identifying all electrically powered equipment including pumps, powered valves, and motors, process control instruments, equipment safety instruments and switches, and motor starters.
2. Wiring and connection diagrams indicating all electrical connections.
3. Motor submittal information as specified in Section 11 05 13.
4. Equipment mounting submittal information specified in Section 46 05 14.
 - a. Applicable operating and maintenance information specified in Section 01 78 23.
 - b. Complete and submit the following forms from Section 01 99 00.
 - 1) Motor Data Form.
 - 2) Unit Responsibility Form.
 - 3) Additional forms required during startup per PART 3.

1.06 QUALITY ASSURANCE

A. Unit Responsibility

1. Assign unit responsibility as specified in Section 46 05 13 to the screw press dewatering equipment manufacturer for the equipment specified in this section.

1.07 SHIPMENT, PROTECTION AND STORAGE

- A. Comply with Section 01 66 00.

1.08 ENVIRONMENTAL CONDITIONS

- A. The equipment will be installed in a weather-exposed outdoor location covered by a canopy.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Dyna Blend as manufactured by Fluid Dynamics, Inc.
- B. Polyblend as manufactured by UGSI ChemFeed.
- C. VeloDyne as manufactured by Velocity Dynamics.
- D. Or equal as specified in Section 01 33 00.
- E. Modify equipment as required to meet the requirements of this section.
- F. Coordinate with dewatering equipment manufacturer.

2.02 MATERIALS

- A. Mounting Frame: Type 304 stainless steel
- B. Mixing Chamber: Type 304 stainless steel or PVC/acrylic
- C. Fasteners: Type 304 stainless steel.
- D. Control Panel: Type 304 stainless steel.

2.03 PIPING CONNECTIONS

- A. Dilution water inlet, 1.0" FNPT
- B. Neat polymer inlet, 1" NPT
- C. Polymer solution discharge, 1.0" FNPT

2.04 EQUIPMENT COMPONENTS

- A. Hydrodynamic Mixing Chamber – Fluid Dynamics
 - 1. Produce high fluid shear conditions without use of internal mechanical mixing systems. Employ hydrodynamic action to combine the polymer and dilution water.
 - 2. Stage mixing energy to provide for high, non-damaging mixing energy over the full operating range of the system which then dissipates through concentric chambers.
 - 3. Provide an integral, multi-stage, stainless steel dilution water booster pump with pressure regulating valve capable of producing a minimum 50 psi differential pressure across the water control orifice. Systems that rely on dilution water

distribution system pressure and flow alone to create mixing energy shall not be acceptable.

4. Provide an integral water control device to also produce mixing energy by creating a pressure drop across its orifice. Configure to allow orifice replacement without disassembly of any other part of the system.
5. Provide drain valve with 1/2" fitting.

B. Motorized Mixing Chamber – UGSI ChemFeed

1. Mix polymer and water in a chamber designed to create sufficient mixing energy.
 - a. Provide a motor-driven impeller that will create high fluid shear for mixing polymer and water.
 - b. Taper mixing intensity as solution exits the initial shear zone and passes through a second zone, isolated by a baffle.
 - c. Design so polymer activation efficiency is consistent over the dilution water range.
2. Motor
 - a. Comply with Section 11 05 13.
 - b. Size: 1 HP maximum.
 - c. Constant speed, washdown duty motor.
 - d. Nominal Maximum speed: 3,450 rpm.
 - e. Direct-coupled to impeller shaft.

C. Hydro-Mechanical Mixing Chamber – Velodyne

1. Mixing Chamber
 - a. Capable of operating on source water pressure alone at 30 psi differential pressure, or independently of plant water pressure through a motor-driven stainless steel mechanical mixer. Design mixing impeller to produce both axial and radial flow and to induce high, non-damaging mixing energy over the full flow range.
 - b. Mixer drive shaft: sealed by a mechanical seal with an integrally mounted and factory plumbed seal flushing valve. Provide a drain port in the mixing chamber to drain polymer solution in case of seal failure. The seal shall be easily accessible for replacement.
 - c. Bearings: external to the mixing chamber.
2. Motor
 - a. Comply with Section 11 05 13.
 - b. Wash-down duty
 - c. Speed: Variable. Provide SCR motor controller.
 - d. Size: 1 HP maximum
 - e. Nominal maximum speed: 1,750 rpm
 - f. Direct-coupled to impeller shaft
 - g. Provide mechanical shaft seal flushing gland

- D. Mixing Chamber Pressure Relief Valve
 - 1. Range: 25 to 65 psi.
 - 2. Stainless steel body with stainless steel, Viton and Teflon internals.
- E. Neat polymer check valve
 - 1. Design to isolate neat polymer from dilution water.
 - 2. Design with an open, unobstructed path to the valve seat.
 - 3. Valve body: Teflon or stainless steel.
 - 4. Seals: Viton
 - 5. Ball and spring: Stainless steel.
 - 6. Make valve readily accessible for cleaning and easily disassembled.
 - 7. Check valves that are installed inside the mixing chamber, or which require mixing chamber disassembly for servicing are not acceptable.
- F. Pressure gauges:
 - 1. Use to monitor the dilution water inlet and diluted polymer solution pressures.
 - 2. Liquid filled and of stainless steel construction.
 - 3. Size: 2-1/2" face
 - 4. Range:
 - a. Dilution Water: 0-100 psig
 - b. Diluted Polymer Solution: 0-60 psig
- G. Dilution Water Control
 - 1. Flow measurement: Rotameter-type flow meter or electronic flow sensor
 - a. Range: 0-10 gpm.
 - b. Provide unions on the inlet and outlet to allow easy removal for cleaning.
 - c. Metering tube: Cast acrylic
 - d. Internal components: Type 316 stainless steel
 - e. Fittings: PVC
 - 2. Flow control: Provide flow control valve
 - 3. Pressure reducing valve:
 - a. Provide stainless steel body PRV in dilution water line
 - b. Minimum output pressure range: 25 - 75 psig.
 - 4. Loss-of-flow indication: Differential pressure switch.
 - a. Set to sense loss of dilution water flow.
 - b. Static working pressure: minimum 150 psi
 - c. Rating: NEMA 4X.
 - d. On loss of dilution water flow, place metering pump on standby; restart automatically when flow is restored.

5. Provide electric solenoid valve for on/off control of total dilution water flow:
 - a. Body: Stainless steel or brass
 - b. Rating: NEMA 4X.
 - c. Power: 120VAC
 - d. ASCO RedHat 8210G or equal.
- H. Neat Polymer Metering Pump
 1. Pump
 - a. Type: Positive displacement, progressing cavity, with 316 SS rotor and Viton stator.
 - b. Priming: Do not require the pump to be modified for priming.
 - c. Mount directly on skid.
 - d. Pump output control: Provide local manual control using a potentiometer, and automatic control in response to a 4-20 mA flow signal.
 - e. Power: 120 VAC.
 - f. Provide loss-of-flow sensor. On low flow/loss of flow, shut down system and provide local and remote indication of alarm. Pressure switches or mechanical or reed type switches are not acceptable.
 - g. Provide a hand vacuum pump for priming.
 2. Motor
 - a. Washdown duty.
 - b. Direct-couple motor and pump to a gear reducer.
 - c. Provide one of the following:
 - 1) 1/2 HP, 0-90 volt TENV DC motor with variable speed provided by an SCR controller
 - 2) Type 2 motor per Section 11 05 13, with VFD
- I. Skid
 1. Construct of 3/16" minimum Type 304 stainless steel angle or structural stainless steel tubing.
 2. Do not use mild steel.
 3. Sheet metal supporting the control panel: Minimum thickness of 12 gauge.
 4. Gusset vertical frame members.
 5. Pipe Supports: Stainless steel.
 6. Design for forklift.
 7. Drill for anchor bolt mounting to concrete pad.
 8. Maximum Dimensions
 - a. Overall: 48" wide x 36" deep x 70" high.
 - b. Mount control panel in vertical position at 60" above pad.

9. Polymer pump suction: do not exceed 18" above pad.
10. Mount piping and valves with rigid pipe clamps. Fasteners required to mount components: Minimum 1/4-20 stainless steel.

2.05 PROCESS CONTROLS AND INSTRUMENTATION:

- A. Require manufacturer to design all electrical components including motor starters, switches, instrument devices, conduit, cable and other miscellaneous components.
- B. Control Panel
 1. Provide relays, digital displays, switches and status lights for all operating units to indicate control of electrical equipment.
 2. Enclosure: NEMA 4X, fiberglass
 3. Equip with a main disconnect switch, lockable in the OFF position and provide with a door interlock feature which prevents the panel front door from being opened unless the disconnect switch is in the OFF position.
 4. Operating Mode: Determined by the position of a LOCAL/OFF/REMOTE switch mounted on the control panel.
 5. Provide contacts for confirmation of polymer feed pump's running status.
 6. Provide local control:
 - a. Panel mounted ten-turn potentiometer knob or membrane keypad with increase/decrease push button, for controlling the neat polymer metering pump in LOCAL mode with digital display of polymer pump speed on panel.
 - b. Internal potentiometer, for controlling the mixing chamber speed.
 7. Provide cable, conduit, conductors, and other electrical hardware per electrical specifications.
 8. Switches and indicator lights: Allen Bradley series 800F or 800H, NEMA 4X. "Mini" LED indicator lights, toggle switches and residential light switches are not acceptable as control devices or indicators.
 9. Provide terminal blocks for all skid mounted electrical components interconnected to control panel. Size for 14 ga. wires with and include terminal block numbers and legend, as manufactured by Entrelec or equal.
 10. Use wire raceway and number wires with adhesive labels.
 11. Control Devices
 - a. Fused type door mounted disconnect (required for 480 VAC or greater).
 - b. LOCAL - OFF - REMOTE switch with contacts to receive remote start/stop signal (dry contact) in "Remote" mode. Unit is manually powered in the "Local" mode.
 - c. HAND-OFF-AUTO switch for operating mode selection. In AUTO mode, control pump speed via 4-20 mA input signal.
 - d. Alarm reset Push-Button.

12. Indicators
 - a. LCD display of polymer pump speed.
 - b. Power ON indicator.
 - c. Low differential pressure or loss of water alarm.
 - d. Loss of polymer
13. Alarms
 - a. Provide Loss of Polymer Flow Alarm, thermal sensor type. Place system on standby when loss of polymer flow occurs, and require manual restart. Provide 0 to 60 second time delay relay to prevent nuisance alarms from occurring.
 - b. Provide Loss of Water Alarm, differential pressure type. Place system on standby on loss of dilution water, and restart automatically when flow is restored.
14. Inputs (signals by others):
 - a. Accept 4-20 mA analog input signal to provide automatic polymer pump pacing in "Auto" mode.
 - b. Accept a run/stop signal (discrete dry contacts) to turn pump on/off in "Remote" mode.
15. Outputs
 - a. 4-20 mA output proportional to pump speed.
 - b. System "Running" status output, dry contact.
 - c. System in "Remote mode" status output, dry contact.

2.06 ACCESSORIES

A. Anchor Bolts

1. Comply with Section 05 50 01.
2. Calculations are required.
3. Minimum diameter: 1/2"

B. Polymer Tote Mixers

1. Provide two (2) adjustable bracket-mounted vertical tote mixers:
 - a. Size for IBC 330-gallon totes.
 - b. Motor: 1/2-horsepower, 115/230 VAC.
 - c. Provide 3/4-inch 316 stainless steel shaft.
 - d. 316 stainless steel propeller shall fold to fit through 2-inch tote opening, and open to 9-inch operating diameter.
 - e. Provide a second folding propeller for mounting along 3/4-inch shaft.
 - f. Include adjustable aluminum mounting brackets. Contractor to coordinate with Owner and mixer supplier to ensure appropriate mounting bracket for IBC tote style in use by Owner.

- g. Include standard 3-prong power cord of sufficient length for the installation as depicted in the Drawings.
- h. Manufacturer:
 - 1) Neptune Chemical Pump Co., Inc. Model RGT 1.0, with RGT-BKT mounting bracket.
 - 2) Or equal.

C. Polymer Tote Heating Blankets

- 1. Provide two (2) adjustable tote heating blankets:
 - a. Size for IBC 330-gallon caged, plastic or metal totes.
 - b. Voltage: 120 VAC
 - c. Wattage: 1440 W
 - d. Provide two heat zones each with an adjustable thermostat: 50-160 degrees Fahrenheit.
 - e. Provide built-in manual reset high-limit safety thermostat for each heat zone set at 195 degrees Fahrenheit.
 - f. Attachment method: adjustable nylon straps with plastic or non-ferrous metal buckles.
 - g. Provide silicone impregnated cloth facing and liner.
 - h. Insulation: 1/4-inch fiberglass
 - i. Include opening for tote spigot.
 - j. Include separate insulated top cover. Top cover shall be removable from remainder of heating blanket to accommodate installation and removal of tote mixers.
 - k. Include standard 3-prong power cord of sufficient length for the installation as depicted in the Drawings.
 - l. Manufacturer:
 - 1) BriskHeat.
 - 2) Or equal.

D. Spare Parts

- 1. Provide 1 set manufacturer's recommended spare parts, including but not limited to the following:
 - a. Solenoid valve.
 - b. Neat polymer metering pump mechanical seal and pump stator.
 - c. Mixing chamber o-rings.
 - d. Neat polymer check valve.

E. Comply with Section 46 05 13.

2.07 FABRICATION

- A. Factory assemble each pump, drive, and motor to its common base.
- B. Factory finish any non-stainless steel components. Comply with Section 09 96 00.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Align, connect, and install each unit as shown and in accordance with the manufacturer's written instructions.
- B. Provide factory-trained personnel to check installation and test initial operation.
- C. Certify installation and initial operation of all components using the appropriate forms included in Section 01 99 00.

3.02 FIELD QUALITY CONTROL

- A. Field quality control and inspections will be performed as specified in Section 46 76 27 and Section 01 81 00.
- B. Corrective Actions: Replace or repair work to eliminate defects, deficiencies and irregularities.

3.03 PERFORMANCE TESTING

- A. General:
 - 1. Following installation, field test polymer system per Section 46 76 27 and Section 01 81 00 to demonstrate compliance with performance requirements as specified.
 - 2. Schedule testing 30 days in advance with the Construction Manager.
 - 3. Include operation of new equipment with new control system.
 - 4. Contractor: responsible for all labor, chemical, water, power and other costs associated with polymer system testing.
 - 5. Empty and dry polymer system equipment and piping following successful testing and commissioning of associated control loops, and prior to pumping chemicals.
- B. Water Tests:
 - 1. Subject polymer system to a field test using water.
 - 2. Test for two hours to demonstrate the mechanical and electrical integrity of the system.
 - 3. Inability to successfully complete clean water tests in three tries because of problems directly caused by the polymer system will be considered cause for the Construction Manager to reject the equipment.
- C. Polymer Test:
 - 1. Repeat clean water test using polymer.

3.04 MANUFACTURER'S FIELD SERVICES

- A. Provide field inspection and instruction services by factory-trained technician or factor trained authorized agent of the manufacturer as specified in Section 46 76 27 and Section 01 81 00.
 - 1. Provide minimum 1 visit of 8 hours, excluding travel time, to inspect and test initial operation, and make necessary adjustments.
 - 2. Provide minimum 1 visit of 8 hours, excluding travel time, to train plant operators to operate and maintain of equipment items included in this Section.
- B. Complete and submit the following forms in Section 01 99 00:
 - 1. Manufacturers Installation Certification.
 - 2. Manufacturers Instruction Certification.

3.05 DEMONSTRATION

- A. Comply with Section 46 76 27 and Section 01 81 00.

END OF SECTION

SECTION 46 76 27

SCREW PRESS DEWATERING EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for furnishing installing a complete screw press dewatering system and all appurtenances specified, or otherwise required, for a complete and properly operating system. The system will be temporarily used to treat waste activated sludge from a sludge blend tank. The system will then be used to treat digested sludge from anaerobic digester.
- B. If required to meet the Project schedule, the screw press dewatering system manufacturer may propose alternative components for consideration during bidding. The alternative components must be equal in quality and function to the components included in this specification. Alternative components must also be industry standard components and components that are typically used by the manufacturer.
- C. Equipment Numbers
 - 1. Screw Press: Tag No. DEW-250-02
 - 2. Flocculation Tank: Tag No. MIX-250-01
 - 3. Polymer Blending Unit: Tag No. POL-250-04
 - 4. Control Panel: Tag No. LCS-250-01
- D. Scope of supply:
 - 1. One (1) screw press dewatering unit, including supports
 - 2. One (1) flocculation tank including mixer
 - 3. One (1) polymer blending and injection system for liquid polymer, including a polymer blending unit.
 - 4. One (1) control panel
 - 5. Mounting equipment, anchor bolts, concrete anchors, and other anchoring devices
 - 6. Spare parts
 - 7. All other accessories and appurtenances required to provide a complete and fully functional screw press dewatering system for Owner's use, whether or not specifically indicated in this Section.
 - 8. Screw press, flocculation tank, polymer blending unit, control panel, and all other accessories and appurtenances will be integrally mounted as components of a dewatering skid, each component prewired and pre-piped to each other on the dewatering skid from the factory.
 - 9. Two shaftless screw conveyors (one inclined conveyor and one horizontal conveyor) will not be integrally mounted to the skid and are to be provided loose and separate from the skid. See Section 41 12 13 for conveyor specifications.

Dewatering skid will have a junction box near the screw press discharge end for all power and signal wiring requirements of the conveyor.

E. Intent of Drawings

1. Drawings show only general locations of equipment, devices, and supports.
2. The Drawings are based on equipment that is manufactured by the first manufacturer named in Paragraph 2.01 of this Specification Section. This first named manufacturer is also listed in the bid form "Major Equipment of System Schedule Supplied by the Construction Contract". The Contractor shall be responsible for the design and construction of any modifications that are necessary to install dewatering equipment provided by another manufacturer. All modifications to the design are subject to approval by the Engineer.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals
2. Section 01 61 10 – Seismic Design Requirements
3. Section 01 66 00 – Material and Equipment
4. Section 01 78 23 – Operations and Maintenance Data
5. Section 01 79 00 – Training
6. Section 01 81 00 – Equipment Startup and Testing
7. Section 01 99 00 – Reference Forms
8. Section 05 50 01 – Anchor Bolts and Anchoring Devices
9. Section 09 96 00 – High Performance Coatings
10. Section 11 05 13 – Electric Motors
11. Section 40 78 00 – Panel Mounted Equipment
12. Section 41 12 13 – Shaftless Screw Conveyor
13. Section 46 05 13 – General Requirements for Equipment
14. Section 46 05 14 – Equipment Mounting
15. Section 46 33 33 – Polymer Blending Units

1.03 REFERENCED STANDARDS

- A. This section contains references to the following documents. They are part of this section as specified and modified. In case of conflict between the requirements of the section and those of the listed documents, the requirements of this section shall prevail.
1. ASTM A322: Carbon and Alloy Steel Bar Specifications
 2. ASTM A507-10: Standard Specification for Drawing Alloy Steel, Sheet and Strip, Hot-Rolled and Cold Rolled
 3. ABMA, Standard 9-90: Load Rating and Fatigue Life for Ball Bearings

4. ABMA, Standard 11-90: Load Ratings and Fatigue Life for Roller Bearings
5. AWS, D1.1: Structural Welding Code

1.04 SUBMITTALS

A. General

1. Comply with Section 01 33 00.
2. Include a checked-off copy of this specification with deviations noted, per Section 01 33 00.
3. Include a copy of the contract document mechanical layout drawings, control diagrams and process and instrumentation diagrams, with addenda updates, that apply to the equipment in this section.
 - a. Mark to show specific changes necessary for the equipment proposed in the submittal.
 - b. If no changes are required, mark the drawing or drawings "No Changes Required".
 - c. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.
4. In all submitted product data, call out model, configuration, size etc. of proposed equipment and/or cross out model, configuration, size etc. of non-applicable equipment.
 - a. Failure to comply with this requirement is sufficient cause to reject the entire submittal.

B. Bill of Materials with quantity, originating manufacturer and part number, and description. List all spare parts separately at the end of the Bill of Materials.

C. Product Data

1. Submit manufacturer's standard catalog data, descriptive literature, motor and drive system data, parts list, equipment weights and lifting points, and detailed specifications describing all system components forming a part of the equipment furnished under this section.
2. Submit coatings information. Refer to Section 09 96 00.

D. Calculations

1. Submit anchor bolt design calculations, stamped and signed by an Oregon registered professional civil or structural engineer. Comply with Sections 01 61 10, and 05 50 01.
2. Calculations documenting the AGMA rating of the drive unit and life of the main bearing for spur and helical gears. For other gearbox types provide manufacturer's catalog engineered rating of the drive unit and calculated life of the main bearing.

- E. Shop Drawings
 - 1. Submit drawings showing the general arrangement of the entire assembly, including:
 - a. Dimensional information
 - b. Plan and section views of the equipment layout
 - c. Location and size of piping connections
 - d. Auxiliary equipment locations
 - 2. Submit manufacturer's equipment mounting instructions, requirements and detailed drawings for the installation of the screw press and flocculation reactor.
- F. Submit a certificate of Unit Responsibility. See Section 01 99 00.
- G. Submit motor data in accordance with Section 11 05 13.
- H. Submit equipment mounting information in accordance with Section 46 05 14.
- I. Submit a written report on results of factory testing specified in Part 3 below.
- J. Submit proposed on-site testing and start-up procedures, including sketches and calculations for specified tests.
- K. Manufacturer's Experience and Qualifications
 - 1. Submit a list of at least twenty (20) installations in which the proposed screw press equipment, of similar or larger capacity, including flocculation reactor system, has been installed and is in operation in municipal wastewater treatment applications. Provide installation date, system solids and hydraulic capacities, and owner contact information for each installation.
 - 2. Submit manufacturer's ISO 9001 certification or other QA/QC documentation and forms.
- L. Electrical Information
 - 1. Electrical Drawings
 - a. Equipment elevations with enclosure details drawn to scale.
 - b. Electrical One-line and Elementary diagrams
 - c. PLC I/O diagrams
 - d. Interconnection diagrams
 - 2. Catalog Data for each component used in the construction of the assembly and control panel:
 - a. Instrumentation data summary sheets to include instrumentation type and tag name, description, manufacturer's model number and part number with all proposed options, range, span, engineering units, input and output characteristics.
 - b. Description of component as it relates to the model number. For each portion of the model number the associated description shall be shown.
 - c. Manufacturer's literature, illustrations, specifications and engineering data including: materials, dimensions, weight, performance, and ordering

information with applicable features and options highlighted, circled, or "arrowed."

- 1) Manufacturer's data not properly marked will not be accepted for review.
 - d. Manufacturer's description or equipment features.
 - e. Physical size and mounting details.
3. Control Panel with Programmable Logic Controller (PLC) and Operator Interface (OI). Submit the following documentation for approval.
 - a. Complete information, catalog cuts, and Bill of Materials for the control panel hardware, software, and configuration.
 - b. PLC Ladder diagrams of the control system programming logic.
 - 1) The Supplier shall submit the ladder logic diagrams utilizing AB RX Logix software or copy of ladder logic file compatible with RX Logix.
 - 2) A narrative functional description shall accompany the ladder diagram describing system operation on a line-by-line basis.
 - c. OI graphic screen printouts for all proposed graphic screens.
 - d. PLC I/O lists and control descriptions. I/O tags shall be those designated on the Contract Drawings P&IDs.
 - e. Submit software operations manual including, as a minimum:
 - 1) Program code
 - 2) Tag database
 - 3) Setpoint listings with description
 - 4) Program description
 - 5) Register cross reference listing
 - 6) Configuration and set-up
 - 7) Data tables
 - 8) Special files
 - f. Electronic copies of proposed PLC ladder logic program listing and OI graphic screens.
- M. Complete and submit the following forms from Section 01 99 00:
 1. Motor Data Form.
 2. Unit Responsibility Form.
 3. Extended Warranty Forms.
- N. Bench Scale Test Report
 1. Manufacturer shall test polymers and make at least two (2) preliminary selections for use during acceptance testing, as specified in 1.05.E.

2. Submit bench test results and polymer selections.
 3. Include the following:
 - a. Narrative description of equipment used for bench testing
 - b. Narrative overview of testing procedures
 4. Contractor shall collect samples and ship them to the manufacturer.
- O. Deferred Submittals:
1. Factory Tests
 - a. Submit certified shop inspection reports indicating that all components of the screw press dewatering equipment have been factory-tested in accordance with the manufacturer's requirements and that the components meet or exceed the requirements of this Section.
 - b. Submit a minimum of 10 days prior to equipment shipment.
 2. Submit operating and maintenance (O&M) information as specified in Section 01 78 23 a minimum of 10 days before equipment shipment.
 3. Submit additional forms required following startup and training per Part 3. Include forms in final O&M manual.
 4. Submit certification of shop trial assembly and photographs of assembly a minimum of 10 days before shipment.
 5. Submit shop inspection records and evidence of inspector qualification a minimum of 10 days before shipment.
 6. Following installation and startup, submit completed Manufacturer's Installation Certification Form.

1.05 QUALITY ASSURANCE

- A. Comply with Section 46 05 13.
- B. Manufacturer
 1. A minimum of 15 years of experience in the design, application, and supply of screw press dewatering equipment in municipal wastewater treatment plants.
 2. A minimum of 20 municipal installations in the United States, Europe and/or Australia in operation for more than one year.
- C. Unit Responsibility
 1. Assign unit responsibility, as specified in Section 46 05 13, to the screw press dewatering equipment manufacturer for the equipment specified in this Section.
 2. Manufacturer shall provide screw press, flocculation reactor tank, polymer system including polymer blending unit, mixers, motors, gear reducers, VFDs, controls, control panels, and lifting attachments as a complete integrated package to ensure proper coordination, compatibility, and operation of the system.

D. Coordination

1. Contractor shall coordinate all details of the equipment with other related parts of the work. Contractor shall verify that all structures, piping, wiring and equipment components are compatible. Contractor shall be responsible for all structural and other alterations required to accommodate equipment differing in dimensions or other characteristics from these specifications and the Drawings.
2. Coordinate the design, fabrication and installation requirements for sludge feed piping and pipeline appurtenances not supplied by the screw press manufacturer.
3. Coordinate PLC I/O data table with Application Programmer performing SCADA and PLC programming on other PLCs for the Project.
4. Contractor to coordinate PLC, Ethernet switch and operator interface panel required in this specification with those specified in Sections 11362, 11374 and 11377 so one manufacturer and model of each type of equipment is supplied on this project

E. Bench Scale Testing:

1. Contractor shall provide sludge samples to screw press dewatering equipment manufacturer.
2. Sludge samples shall be obtained by the Owner from existing belt filter press feed before polymer addition. Contractor shall provide sampling instructions to Owner and coordinate scheduling of sampling.
3. Sludge sampling shall be performed at a time when the sludge conditions are within the ranges specified for Condition 1 in paragraph 2.03.
4. Contractor shall be responsible for shipping sludge samples to screw press dewatering equipment manufacturer.
5. Upon receipt of sludge samples, manufacturer shall test polymers and make at least two (2) preliminary selections for use during acceptance testing.
6. Submit bench test results and polymer selections.

1.06 WARRANTY

A. Provide a written extended warranty from the manufacturer for the equipment specified in this Section.

1. Extended Warranty Period: Ten (10) years from successful completion of the demonstration period for the dewatering system.
2. Coverage: Cover defects or failures of materials or workmanship which occur as the result of normal operation and service.
3. Complete the Extended Warranty Form in Section 01 99 00.

B. Screw Press Dewatering Equipment Performance

1. Guarantee screw press dewatering equipment performance as specified in paragraph 2.03 when flow and water quality parameters conform to those specified in paragraph 2.03.

2. Length: 2 years from successful completion of the demonstration period for the dewatering system.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. FKC Co., Ltd. (Port Angeles, WA)
- B. Or equal, as specified in Section 01 33 00

2.02 OVERALL SYSTEM REQUIREMENTS

- A. Design to receive, flocculate, condition, and dewater the feed sludge specified herein, and neatly discharge the dewatered sludge cake into the existing discharge chute.
- B. Design to accommodate municipal secondary wastewater solids without jamming, clogging, or overflow.
- C. Design to operate continuously 24 hours per day, 7 days per week or intermittently.
- D. Design to operate in both manual and fully automatic modes.
- E. Design to operate at variable rates to accommodate varying combinations of sludge concentration, sludge feed rate, and polymer addition, in order to optimize cake solids concentration, capture rate and polymer use. Tracking sludge concentration changes is not required.
- F. Screw press shall be capable of retaining a plug of feed and/or dewatered sludge inside the dewatering screen basket for up to 72 hours without adversely impacting screw press components or startup procedures for the subsequent dewatering run.
- G. Structural Design
 1. Design and manufacture all components to handle the forces that may be exerted during fabrication, shipping, erection, and proper operation according to the O&M manual.
 2. Design so that jamming at any point will cause the drive motor to stall without resulting in component damage or structural failure.
 - a. Provide motor load setpoints in PLC and VFD.
- H. Provide drains with the ability to drain all liquid and feed sludge from the dewatering and flocculating equipment and piping.
- I. Corrosion Control
 1. Equipment design shall not result in crevices, unsealed overlapping plates and similar inaccessible areas where corrosion can take place without allowing access for application of preventive measures.
 2. It may be expected that the material discharged to each screw press will be in an actively digesting state.
 3. Corrosive agents (moisture, hydrogen sulfide gas, sulfuric acid, etc.) will be present at all times.
- J. Inspection, Maintenance, Repair and Adjustment Provisions
 1. Provide sufficient room for inspection, maintenance, repair and adjustment.

2. All components shall be so arranged that they can be serviced from the operating floor or from the permanent access platforms shown on the Drawings.

- K. The sludge is expected to contain quantities of industrial and municipal wastes including solvents, petroleum products, grit, hair, rags, grease, rubber goods, and organic solids.

2.03 DESIGN CRITERIA & PERFORMANCE REQUIREMENTS

- A. Provide screw press equipment suitable for the following conditions:

Item	Value	
	Condition 1	Condition 2
Type of sludge	Waste Activated Sludge	Anaerobically Digested Sludge
Upstream sludge storage/stabilization	Secondary Treatment	Anaerobic Digestion
Feed solids concentration	0.5 – 2.0%	1.0 – 2.5%
Hydraulic Loading Rate	10 gpm, min 100 gpm, max	10 gpm, min 100 gpm, max
Average Solids Throughput	458 dry pounds per hour (per unit)	458 dry pounds per hour (per unit)
Volatile solids ratio	60 – 75	45 - 50
Temperature	45 – 95 °F	45 – 95 °F
pH	6.0 – 8.0	6.0 – 8.0
Flocculant	Liquid Emulsion Polymer	Liquid Emulsion Polymer
Maximum polymer consumption, lbs active polymer/dry ton of solids	30	35
Effluent cake solids concentration	15%	18%
Minimum solids capture	95% minimum or 750 mg/L TSS maximum	95% minimum or 750 mg/L TSS maximum

- B. Meet the performance requirements with either more than one commercially available polymer, or with a polymer that is commercially available from more than one vendor.

2.04 MATERIALS

- A. Screw press and flocculation reactor components shall be manufactured from Type 304 or better stainless steel shapes (rods, angles, and channels), pipes, and sheets unless otherwise specified.
 1. This requirement includes, but is not limited to, the following:
 - a. Screw
 - b. Screw shaft
 - c. Perforated plate basket
 - d. Screw press cover and inspection lids
 - e. Screw press frame

- f. Screw press and flocculation reactor support structures
 - g. Piping connections
- 2. Control panel enclosure: Type 316 stainless steel
- 3. Fasteners and anchor bolts: Type 316 stainless steel or Type 304 stainless steel
- 4. Minimum stainless steel sheet thickness (excluding cover parts & assemblies): 1/8 inch.
- 5. Elastomer seals on helical screw flights, if required, shall be wear-resistant nylon or polyurethane. The seals shall be held in place by Type 316 stainless steel clamps and bolts which can be easily removed. Seals shall be replaceable without removal of the screw.
- B. Bearings shall be anti-friction, and may be grease lubricated.

2.05 FABRICATION

- A. Screw press shall be manufactured in a manner to prevent contamination of the stainless steel with rusty dust.
- B. All stainless steel components and structures shall be pickled with nitric acid and hydrofluoric acid to remove any residues that may be present on the material as a result of forming, manufacture, or handling. After pickling, wash the equipment with a high-pressure wash of cold water to remove any remaining surface debris and promote the formation of an oxidized passive layer.
- C. Perform all welding in accordance with American Welding Society (AWS) D1.1 Structural Welding Code, or equivalent.

2.06 SCREW PRESS

- A. Design the screw press to be installed horizontally.
- B. Dewatering of the sludge shall take place in a perforated plate basket, consisting of a minimum of four sections of perforated plate.
 - 1. Provide longitudinal flanges to allow basket disassembly.
- C. The screw press shall be completely enclosed to prevent odor emission.
 - 1. The entire dewatering section and basket area shall be easily accessible through inspection lids, which are mounted on the sides of the machine.
 - 2. Minimum five inspection lids each side of screw press.
 - 3. Inspection lids shall be easily removed and contain all liquids and aerosols resulting from normal dewatering and spray washing operations.
 - a. Lifting weight of each inspection lid shall be limited to 21 lbs.
- D. Employ a shafted, helical screw installed inside of the screen basket to transport sludge from the inlet to the discharge area at the end of the pressure zone.
 - 1. A shaftless screw is not acceptable.
 - 2. Taper up screw shaft diameter towards the discharge section of the machine.

3. A bearing shall support the drive end of the screw shaft. Wear strips are not acceptable.
- E. Drive motor
1. Location
 - a. FKC: Provide an in-line, flange mounted motor at the inlet end of the screw press.
 - b. Other manufacturers: The screw press drive motor may be located at either end of the screw press.
 2. Motor speed shall be controlled with a VFD.
 3. Gear drive unit shall be directly coupled to the screw shaft.
 4. Motor shall be directly coupled to the gear reducer or may drive the gear reducer using a belt drive.
 5. All motor couplings and other high-speed rotating parts shall be provided with OSHA-approved guards.
- F. Clean the perforated screen basket from the outside using a spray bar washing system made of stainless steel piping and stainless steel or PVDF spray nozzles. Plastic nozzles are not acceptable.
1. Cleaning shall not interrupt dewatering operation.
 2. The spray area shall cover the entire length of the screen. One or more solenoid valves shall control the flow to the spray bar washing system.
 3. Clean the entire surface area of the basket during each cleaning cycle.
 4. Provide minimum 1.25-inch connections for cleaning water supply connections to the spray system.
 5. Water pressure at each nozzle of the spray bar shall be a minimum of 40 PSIG.
 6. Average spray water consumption shall not exceed 72 gallons at 40 PSIG per wash cycle.
- G. If required, provide a pneumatically actuated cone to adjust the pressure in the pressure zone at the discharge end of the screening basket.
1. Adjust pressure on the cone manually through an air pressure regulator installed on the screw press
 2. Provide a one-quarter inch (1/4") industrial style stainless steel female quick coupler for pressurized air supply connection at the manifold of the pneumatic system.
- H. Sludge cake shall be automatically discharged through a rectangular sludge discharge opening.

I. Screw Press Drive

1. The press screw shall be driven by a shaft mounted gearbox or speed reducer, and an electric motor
 - a. The gear reducer or speed reducer shall be bolted to a machined flange welded to the inlet end of the press.
 - b. The motor may be bolted directly to the gear reducer or speed reducer, or may drive the gear reducer using a belt drive.
 - c. Minimum L-10 bearing life of motor and gear reducer or speed reducer: 100,000 hours.
2. Gear Reducer:
 - a. Maximum gear reducer output speed: 0.35 rpm at 100 percent motor speed.
 - b. AGMA Class 2, service factor 1.5
3. Drive motor:
 - a. Comply with Section 11 05 13.
 - b. Type 2 Motor, inverter-duty, NEMA Design B.
 - c. Minimum service factor: 1.15
 - d. Size: maximum 2 hp
 - e. Power: 480 volt, 3 phase, 60 Hertz.
 - f. Nominal maximum speed: 1,800 rpm.

J. Piping connections:

1. All piping connections 3 inches or larger shall be ANSI, Class 150 standard raised face flanges:
 - a. Single 6-inch or larger bottom drain connection for conveyance of screw press filtrate
 - b. 6-inch minimum diameter inlet connection for feed sludge
2. All piping connections 2.5 inches and smaller shall be threaded
 - a. 2-inch diameter connection for cleaning water supply on top of press
 - b. 1.5-inch diameter connection for cleaning water supply at sludge inlet
 - c. 1.5-inch diameter connection for cleaning water supply at drive

K. Headbox Level Transmitter

1. Provide pressure sensor for level with 4-20mA output.
2. IFM eFector PI-001BREZ02-MFRKG/US, or approved equal

2.07 UTILITY WATER MANIFOLD

- A. Provide utility water manifold and water panel per P&ID drawing I-251.
- B. Manifold shall have a common 2-inch header that serves three separate wash water headers.
- C. A flow switch shall be provided on the 2-inch common header.
- D. Each wash water header shall be provided with the following
 - 1. Solenoid valve
 - 2. Isolation ball valves
 - 3. Bypass pipe

2.08 FLOCCULATION TANK

- A. Provide a flocculation tank for mixing and aging of polymerized sludge prior to dewatering.
- B. Construct wetted parts of Type 304 or better stainless steel.
- C. Include anti-rotation baffles.
- D. Design for a retention time of 2.0 – 4.0 minutes at the design flow rate.
- E. Minimum tank volume shall be 285 gallons.
- F. Locate the inlet at the bottom and the conditioned sludge outlet near the top of the tank.
- G. Provide a mixer.
 - 1. Motor size: 1.0 hp minimum, 1,800 rpm, 480 volts, 3 phase.
 - 2. Drive:
 - a. Variable speed drive with shaft speed range of 13-64 rpm
 - b. Gear reducer: SEW Eurodrive Varimot Variable Speed Gearmotor, Nord, or equal.
 - 3. Control speed through dewatering system control panel.
- H. Provide stainless steel support structure for flocculation chamber, including mounting hardware.
- I. Provide the capability to visually inspect floc formation, either directly in the flocculation tank, or in discharge piping.
- J. Piping connections:
 - 1. 4-inch diameter ANSI, Class 150 standard raised face flange, bottom connection for inlet sludge
 - 2. 8-inch diameter pipe stub with flexible coupling outlet connection for polymer conditioned sludge
- K. Flocculation Tank High Level Alarm
 - 1. Provide level switch in the tank for high-high level alarm.
 - 2. Provide Warrick 16MA1B0, or approved equal.

2.09 POLYMER BLENDING AND INJECTION SYSTEM

- A. Provide a skid mounted polymer blending unit per Section 46 33 33.
- B. Polymer blending unit shall meet the following requirements:
 - 1. Designed to activate liquid emulsion polymer.
 - 2. Capable of mixing, blending and aging liquid polymer on a continuous basis to meet screw press requirements.
 - 3. Include a neat polymer pump and hose connections that allow for polymer to be withdrawn from either 55-gallon drums or 275-330-gallon IBCs (totes).

2.10 SHAFTLESS SCREW CONVEYORS

- A. Provide shaftless screw conveyors per 41 12 13

2.11 COATINGS

- A. Factory coat non-stainless steel components per Section 09 96 00.

2.12 CONTROL PANEL

- A. A control panel shall be provided for controlling the screw press, flocculation tank, polymer blending unit, and conveyors specified in this Section.
- B. The control panel shall be cooled to maintain the operating temperatures of all components inside the control panel.
- C. The control panel shall be rated for 65,000 AIC minimum.
- D. The control panel shall meet the requirements of Section 40 78 00 Panel Mounted Equipment.
- E. The Control Panel shall have the following components
 - 1. Housing
 - a. Provide stainless steel, NEMA 4X enclosure per 40 78 00.
 - 2. Switches and Indicator Lights
 - a. Provide switches and indicators per 40 78 00
 - b. Flocculation Tank Mixer
 - 1) Local-Off-Remote switch
 - 2) On-Off-Auto switch
 - 3) Running indicator
 - 4) Failure indicator
 - 5) Speed selector switch
 - c. Screw Press
 - 1) Local-Off-Remote switch
 - 2) On-Off-Auto switch
 - 3) Running indicator

- 4) Failure indicator
- 5) Speed selector switch
- d. Conveyor
 - 1) Local-Off-Remote switch
 - 2) On-Off-Auto switch
 - 3) Running indicator
 - 4) Failure indicator
 - 5) Speed selector switch

3. Hardwired Alarms

- a. Provide at minimum the following hardwired input alarms that shall be monitored by the control panel:
 - 1) 120VAC Power OK
 - 2) Floc Tank Level Switch Hi-Hi
 - 3) Floc Tank Mixer In-Auto
 - 4) Floc Tank Mixer Running
 - 5) Screw Press In-Auto
 - 6) Screw Press Running
 - 7) Screw Press Fail
 - 8) Polymer System In-Auto
 - 9) Polymer System Running
 - 10) Polymer System Trouble
- b. Provide at minimum the following hardwired outputs from the control panel:
 - 1) Floc Tank Mixer Run Command
 - 2) Screw Press Run Command
 - 3) Polymer System Run Command
- c. Provide at minimum the following analog inputs that shall be monitored by the control panel:
 - 1) Floc Tank Mixer Speed Feedback
 - 2) Screw Press Speed Feedback
 - 3) Screw Press Headbox Level
 - 4) Wastewater Solenoid 1 Open Command
 - 5) Wastewater Solenoid 2 Open Command
 - 6) Wastewater Solenoid 3 Open Command

- d. Provide at minimum the following analog outputs from the control panel:
 - 1) Sludge Feed Pump Speed Command
 - 2) Floc Tank Mixer Speed Command
 - 3) Screw Press Speed Command
 - 4) Polymer System Speed Command
- 4. Touch Screen
 - a. Touch screen shall be Allen Bradley PanelView Plus 7 Color touch screen in minimum 15" size with minimum 640x480 resolution, 120VAC or approved equal.
 - b. Provide the following control functions on the touch screen, where applicable:
 - 1) Auto/Manual Selection
 - 2) Sludge Feed Flow
 - 3) Screw Press Speed
 - 4) Polymer Water Feed Rate
 - 5) Alarm Silence
 - 6) Alarm Reset
 - 7) Manual Start/Stop
 - 8) Screen Contrast
 - 9) Low Polymer Water Fault
 - 10) Washwater Selection
 - 11) Automation Set Points
 - a) Feed sludge flow rate
 - b) Polymer dose relative to flow
 - c) Headbox level
 - c. Display the following on the touch screen:
 - 1) Sludge feed flow (gpm)
 - 2) Screw press speed (rpm)
 - 3) Diluted polymer solution feed rate (gpm)
 - 4) Neat polymer feed rate (gph)
 - 5) Automation Status
 - 6) Polymer Pump Status
 - 7) Alarm indications
 - 8) Fault History

5. Variable Frequency Drives
 - a. AB Powerflex 525 series
 - b. Variable frequency drives (VFDs) shall be provided for the screw press and flocculation tank
 - c. Each variable frequency drive (VFD) shall be provided as a standalone unit. The VFD shall be of the latest technology capable of driving variable or constant torque motor loads at variable speeds to control and/or maintain a process variable (level, flow, pressure, etc.) by varying the motor speed. The VFD shall have the following attributes:
 - d. The VFD shall use high efficiency sinusoidal PWM (pulse width modulation) control of IGBT power transistors.
 - e. Alpha-numeric human interface module (HIM) digital display with keypad to view and adjust diagnostic and status indicators. HIM shall be on VFD inside panel enclosure.
 - f. Continuously operable in ambient temperatures, 25°F to 110°F (-4°C to 43°C), and relative humidity, 95% non-condensing.
 - g. Automatic fault reset to automatically restart the drive after any type of fault condition -- up to three attempts. When the drive is locked out after its automatic reset attempts the operator shall be able to reset the VFD by cycling power or via keypad.
 - h. Digital inputs for start, preset speed and direction; relay outputs for alarm and run; 4-20 mA input for speed command; 4-20 mA output for speed indicator.
6. VFD Line Reactors
 - a. Hammond Power Solutions CRX Series, or approved equal.
 - b. Reactor construction shall be iron core with a minimum impedance of (3) percent.
 - c. Reactor windings shall be copper or aluminum wound.
 - d. Reactor insulation shall be Class H with a 115 degree C rise over 50 degree C ambient.
 - e. Reactor shall be rated for system voltage and frequency.
7. Programmable Logic Controller (PLC)
 - a. Allen Bradley CompactLogix 1769-L3X series, or 5069-L3X series.
 - b. PLC shall have no imbedded input/output (I/O) controllers.
 - c. Provide input/output (I/O) modules as required for a functional system as specified.
8. Unmanaged Ethernet Switch
 - a. Allen Bradley 1783-US8T, or approved equal.

- b. Ethernet switch shall be modular style, suitable for use in harsh industrial environments.
 - c. Switch shall be UL Listed and EtherNet/IP Certified.
 - d. Port count shall be at minimum (8).
 - e. Copper Ethernet connectors shall be RJ45.
- 9. Control Power Transformer
 - a. Shall be GE, Hammond Power Solutions, or approved equal.
 - b. Shall be 480VAC, 1-phase primary and 120/240VAC 1-phase secondary.
 - c. Minimum output shall be 3000VA.
- 10. Uninterruptible Power Supply (UPS)
 - a. Control panel shall include an uninterruptible power supply for backup power.
 - b. Power supplies shall be rated for 1000VA, 120VAC, 60Hz.
 - c. Power supplies shall be UL508 listed
- 11. Programmable Logic Controller (PLC)
 - a. CompactLogix 1769-L3xER series CPU with standalone I/O
- 12. Programming
 - a. Provide all programming of PLC and OIT per this specification Section and Section 40 61 916.13 Control Descriptions. All programming shall be ladder code only.
 - b. Provide graphics on OIT to be migrated to plant SCADA system as part of a future project.
 - c. Program all alarms using the "ALMA" & "ALMD" blocks in the PLC to report to an Alarm Server installed as a future project. Also provide a digital output to a Relay that includes all Dialout Critical Alarms. This will be used to trigger a Banner Radio signal to a Dialer System. Radio and dialer system installed by others.

2.13 OTHER ELECTRICAL COMPONENTS

- A. Manufacturer shall provide provisions for separate power and communication utility connections. Provide two junction boxes, sized by the Manufacturer, for power and communication. Provide power distribution blocks, including grounding provisions, for the power connection. Provide a grounded RJ45 connection, suitable for accepting 600-volt, CAT6 Industrial Ethernet cabling. The boxes shall be sized to include adequate space for terminations and cable bending radii as required by UL and the NEC.
- B. All equipment-mounted conduit shall be PVC-coated galvanized steel conduit or 2-foot maximum length non-metallic liquid tight conduit.

2.14 SPARE PARTS

- A. The following spare parts shall be included and supplied together with the equipment:
 - 1. One (1) set of helical screw flight seals with mounting hardware (if required)
 - 2. One (1) set bearing assemblies for screw shaft
 - 3. One (1) solenoid valve of each size for spray bar washing system
 - 4. Ten (10) nozzles for spray bar washing system
- B. Spare parts shall be packaged with labels indicating the contents of each package, and shall be delivered to Owner as directed.

PART 3 - EXECUTION

3.01 FACTORY TESTING

- A. All major system components shall be factory tested for compliance with the construction and functional requirements specified herein. A copy of the test reports, certified by an officer of the Supplier, shall be submitted prior to shipment.

3.02 WIRE MARKING

- A. All panel, enclosure and field wiring shall have wire labels on both ends of each wire. Labeling shall be neatly installed for visibility and shall be clearly legible. Each conductor of instrument shielded signal wiring shall be labeled. Wire labels shall be machine printed with on white heat shrinkable tubing. Each label shall fit a minimum 23 characters, 3/16" in height before shrink. Tubing shall be oversized for the wire and shrunk into place using an electric heat gun. The "shrunk" label shall have just enough give to allow the label to be rotated. Hand lettered wire labels are not acceptable and shall be replaced at the Supplier's expense. Provide Brady "PermaSleeve" or approved equal.
- B. Wiring Methods:
 - 1. Wiring Separation: Wires carrying 100 volts and above shall be physically separated from lower voltage wiring by using separate bundles or wire ways with sufficient distance to minimize the introduction of noise, crossing only at 90 degree angles.
 - 2. Harness: All wiring shall be neatly bundled and laced with plastic tie-wraps, anchored in place by screw attached retainer. Where space is available, wiring shall be run in slotted plastic wireways with dust covers. Wireways shall be sized such that the wire fill does not exceed 60%. Tie-wraps shall be T&B TY-RAP or approved equal.
 - 3. Retainers: Wireways, retainers, and other devices shall be screw mounted with round-head 316 stainless steel screws or mechanically mounted by push-in or snap-in attachments. Glue or sticky back attachment of any type or style shall not be used. Retainers shall be T&B TC series or approved equal.
 - 4. Hinge Loops: Where wiring crosses hinged surfaces, provide a "U" shaped hinge loop protected by clear nylon spiral wrap. The hinge loop shall be of sufficient length to permit opening and closing the door without stressing any of the terminations or connections. Spiral wrap shall be Graybar T25N or approved equal.

5. Routing: Wires and cable shall be routed along the shortest route between termination points, excepting routes which would result in routing 120 VAC and other wires and cables in the same duct or bundle. Wires and cables shall have sufficient length to allow slack and to avoid any strain or tension in the wire or cable.
6. Wires shall be routed in slotted plastic wireways with snap covers. Wires carrying 120 VAC shall be separated as much as possible from other wires and signal cables, and shall be routed only in ducts for 120 VAC. If the power wiring has to cross the signal wiring, the crossing shall be as close to a right angle as possible. Wireways for 24 VDC wiring shall be used for all other wires and cables. Routing of 120 VAC in combined wireways shall be minimized. Wires and cables shall be placed in the wireways in a straight, neat and organized fashion and shall not be kinked, tangled or twisted together. Additional wire ducting shall be provided for use by the electrical subcontractor for routing field wires to their landing points in the each electrical and instrumentation panel.
7. Provide 2" minimum separation between wireway and terminal blocks.
8. Wiring not routed in wireways shall be neatly bundled, treed, and laced with plastic ties.

3.03 ELECTRICAL CONSTRUCTION METHODS

- A. Mating fittings, bulkhead fittings, plugs, connectors, etc. required to field interface to the equipment and panels shall be provided by the when the equipment is delivered.
- B. All electrical and instrumentation drawings associated with the equipment shall be provided with the equipment when it is delivered to the job site. Drawings for each piece of equipment shall be placed in clear plastic packets of sufficient strength that will not tear or stretch from drawing removal and insertion.
- C. Electronic PDF version of O&M, electrical and instrumentation drawings associated with the equipment and electronic copies of the PLC and OI programs shall be provided on a USB drive with no password protection on a lanyard and placed within the panel. Label drives with clear plastic with black machine printed lettering as produced by a KROY or similar machine. The size of the nameplate tape shall be with 3/8-inch lettering unless otherwise approved by the Engineer. Securely fasten nameplates in place on the USB drive using the adhesion of the tape.

3.04 SHIPMENT AND STORAGE

- A. Comply with Section 01 66 00.
- B. Site Storage and Handling of Equipment
 1. Store the supplied equipment in accordance with the manufacturer's recommendations and instructions.
 2. Store gear reducers / speed reducers and motors in buildings or trailers and protected from dust, dirt, and moisture.
 3. Take responsibility for work, equipment, and materials until inspected, tested and finally accepted.

3.05 INSTALLATION

- A. The equipment Supplier's representative shall be available by telephone as required during construction. During equipment installation, the Supplier's representative shall visit the site as needed to insure that the installation is in compliance with the Supplier's recommendations and instructions, and the requirements of this Proposal.
- B. Contractor shall provide temporary or rental hoisting equipment to facilitate installation.

3.06 SUPPLIERS' CERTIFICATION

- A. Prior to system startup and functional testing, all equipment described herein shall be inspected by the Supplier's representative for proper alignment, proper connection, and satisfactory performance of all components.
- B. The Supplier's representative shall approve installation and provide certification using Manufacturer's Installation Certification Form in Section 01 99 00.

3.07 EQUIPMENT START-UP AND TESTING

- A. Comply with Section 01 81 00.
- B. Proposed test procedures shall be developed by the installation screw press equipment Supplier's representative. The procedures shall be submitted to the Owner and installation Contractor and reviewed by the Owner before scheduling and performing the functional test.
- C. Testing shall be conducted by the Supplier's representative and installation Contractor and witnessed by the Owner. The testing shall demonstrate that the dewatering equipment and related control system operate in accordance with the specifications including all operating, monitoring, and shutdown functions. Testing shall also demonstrate that the performance of the system is stable and not subject to hunting, over-adjustments, and cycling of components.
- D. Pre-Operational & Functional Testing
 - 1. Comply with Section 01 81 00 – 3.02 & 3.03.
 - 2. If, in the opinion of the Owner, the system meets the requirements specified herein, the system will advance to performance testing. If, in the opinion of the Owner, the pre-operational and functional test results do not meet the requirements specified herein, the system will be classed as nonconforming.
 - 3. In the case of a nonconforming system, advancement to subsequent testing and monitoring will not commence until the system is classed as conforming. The dewatering equipment Supplier's representative shall make, at no additional cost to the Owner, such adjustments, changes, and/or additions as are necessary to correct the system and retest it as specified above until, in the opinion of the Owner, the system has conformed to these Specification.
- E. Performance Testing
 - 1. The screw press equipment Supplier's representative shall start up and operate the dewatering system continuously for two (2) eight-hour day shifts to demonstrate compliance with the performance requirements in paragraph 2.03.

2. Performance must be demonstrated at the minimum and maximum solids and hydraulic loading rates specified in paragraph 2.03.
3. Supplier shall be responsible for selecting and providing polymer used throughout the performance testing and demonstration. These activities shall comply with the following:
 - a. Select one or more initial polymers based on bench scale testing specified in paragraph 1.05.E.
 - b. Select initial polymer(s) based on sludge samples taken no more than one (1) month prior to the demonstration period.
 - c. Selected polymer(s) shall be commercially available from more than one vendor.
 - d. Inappropriate polymer selection(s) shall not relieve the Supplier from complying with performance or demonstration period requirements.
 - e. Supplier shall provide all polymer required to operate the screw press dewatering system until the Supplier has been notified of the official acceptance of the dewatering system. Supplier shall provide to the Owner contact information for the polymer vendor(s) which provide the polymer(s) used during the performance and demonstration periods.
4. Supplier shall endeavor to optimize polymer consumption for the dewatering equipment. Upon achieving the specified performance requirements during the two-day performance test specified above, Supplier's representative shall vary the polymer dose between 80% and 120% of the dose used for the successful two-day performance test, in increments of 10%, and provide to the Owner a written summary of the resulting dewatering performance parameters, including cake solids concentration and solids capture percentages
5. Contractor shall coordinate with the Owner to ensure that there is a sufficient volume of sludge stored in the aerobic digester to provide feed stock for the performance testing and the demonstration period specified in Paragraph 3.08.F.

F. Demonstration Period.

1. Following the successful two-day operational test as specified above, the screw press equipment Supplier's representative shall conduct the demonstration period testing specified in this Section.
2. Operate facility for four (4) eight-hour day shifts within a period of two (2) calendar weeks with plant personnel present. The system must operate under automatic controls continuously and meet the performance requirements specified in Paragraph 2.03 at all times during the test. Operator interface or adjustments must not exceed once per hour.
3. During the demonstration period, collect samples for cake solids and capture analysis after each two-hour period of operation.

4. Following the demonstration period, produce a report of the test results. For each sample, list the following:
 - a. Date
 - b. Time
 - c. Sludge feed rate (gpm)
 - d. Sludge feed concentration (%)
 - e. Polymer feed rate (lb/dry ton)
 - f. Cake solids (%)
 - g. Capture rate (%)
 5. The Supplier shall be responsible for all aspects of sampling and analysis during the demonstration period.
 6. At the conclusion of one of the day shifts described above, the dewatering system must be shut down automatically after a two (2) hour time delay. Automatic shutdown operations must include a washdown cycle (mandatory) and the expulsion of thin and dewatered sludge inside the screw press (if required by Supplier's typical operation). No operator interface or adjustments may be made during the programmed time delay or during the automatic shutdown operations.
 7. For a continuous 4-hour period, the facility must operate at the specified maximum solids loading rate or hydraulic loading rate, whichever is limiting, while producing a minimum average sludge concentration of 15 percent and a minimum average capture rate of 95% or maximum filtrate solids of 750 mg/L TSS, as reflected in the performance requirements listed. No operator interface or adjustments may be made during this period.
 8. The above requirements must be met using 100% feed sludge from the subject facilities without any sludge conditioning or other supplemental additions, other than the polymer indicated.
- G. If, in the opinion of the Owner, the system meets the performance requirements specified herein during the testing specified above, the Owner will notify the Supplier of the official acceptance of the dewatering system.
- H. If, in the opinion of the Owner, the system does not meet the performance requirements specified herein during the testing specified above, the Owner shall notify the Supplier in writing of the nonacceptable performance.
1. In the case of nonacceptable performance, the Supplier shall then have 45 days in which to perform at the Suppliers' expense, any supplemental testing, equipment adjustments, changes or additions and request an additional retest of the nonacceptable system.
 2. Time required by the Supplier to perform such measures shall not relieve the Contractor from compliance with the completion times specified in Section 00510 (Construction Agreement).

3.08 MANUFACTURER FIELD SERVICES

- A. Provide field inspection and instruction services by a factory trained service representative of the manufacturer. Services by a sales representative are not acceptable.
 - 1. Provide a minimum of two visits, each of a three-day duration, 8-hour minimum work hours per day, travel time excluded, for assistance during installation, equipment startup and testing.
 - 2. Submit a Manufacturer's Certificate of Installation (Section 01 99 00).
- B. Provide a minimum of 8 hours over two days, excluding travel time, to train plant operators.
 - 1. Comply with Section 01 79 00.
 - 2. Conduct training sessions for Owner's staff in the proper operation and maintenance of the equipment, including all instrumentation and controls.
 - 3. Conduct training during the latter portion of the functional testing when the equipment is fully operational and before the equipment's Demonstration Period.
 - 4. Include orientation of the Owner's staff to the operation and maintenance information provided by the Equipment Supplier.
 - 5. Include a complete disassembly and re-assembly of all major parts and components of one screw press unit.
 - 6. Submit a Manufacturers Instruction Certification Form. (Section 01 99 00).
- C. Make additional site visits as required to comply with these specifications at no additional cost to the Owner.

END OF SECTION

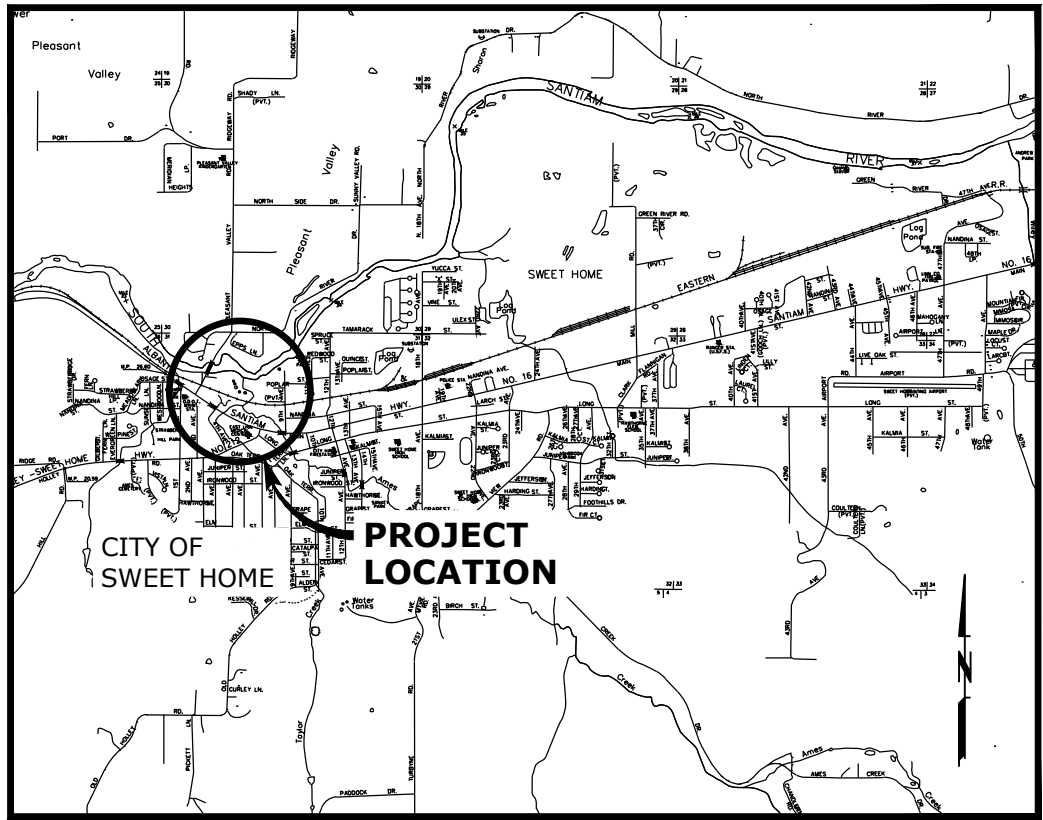
Exhibit A

Drawings

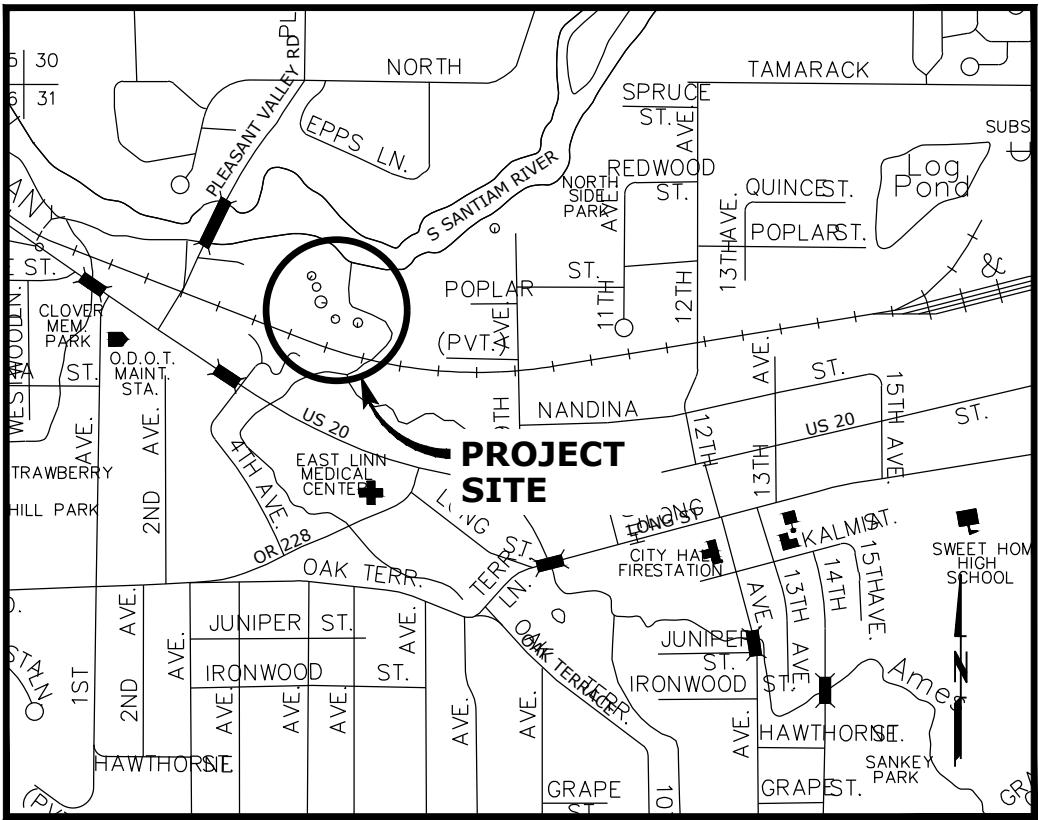


MAHLER WRF OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

DECEMBER 2022



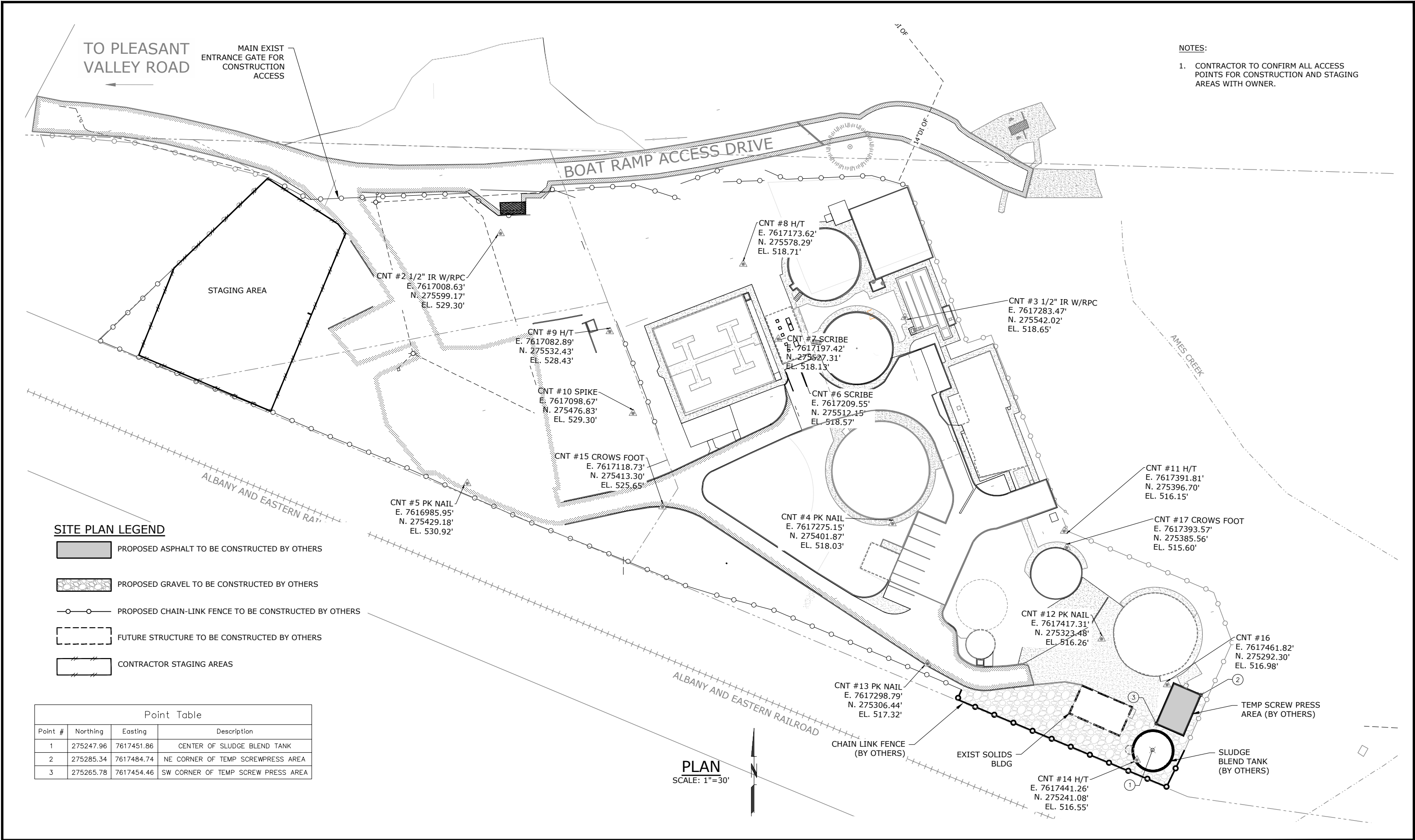
VICINITY MAP
SCALE: 1"=2000'



LOCATION MAP
SCALE: 1"=500'

ATTENTION: OREGON LAW REQUIRES THE CONTRACTOR TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. THE CONTRACTOR MAY OBTAIN COPIES OF THE RULES BY CALLING THE UTILITY NOTIFICATION CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-246-6699.)

P:\Clients\936 City Of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\DeWatering Equip Pre-Purch\19-2605-OR-C-SITE-DW-PP.dwg C-010 12/6/2022 5:05 PM BBARRY 24.1s (LMS Tech)



- NOTES:
1. CONTRACTOR TO CONFIRM ALL ACCESS POINTS FOR CONSTRUCTION AND STAGING AREAS WITH OWNER.

SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL TO BE CONSTRUCTED BY OTHERS
- PROPOSED CHAIN-LINK FENCE TO BE CONSTRUCTED BY OTHERS
- FUTURE STRUCTURE TO BE CONSTRUCTED BY OTHERS
- CONTRACTOR STAGING AREAS

Point Table			
Point #	Northing	Easting	Description
1	275247.96	7617451.86	CENTER OF SLUDGE BLEND TANK
2	275285.34	7617484.74	NE CORNER OF TEMP SCREWPRESS AREA
3	275265.78	7617454.46	SW CORNER OF TEMP SCREW PRESS AREA

NO.	DATE	BY	REVISION

NOTICE

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BVB
DESIGNED

BVB
DRAWN

WJM
CHECKED

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MAHLER WRF
OWNER-PROVIDED
DEWATERING EQUIPMENT
PROCUREMENT

**OVERALL SITE PLAN, STRUCTURE
COORDINATES, STAGING AND
ACCESS, SURVEY CONTROL POINTS**

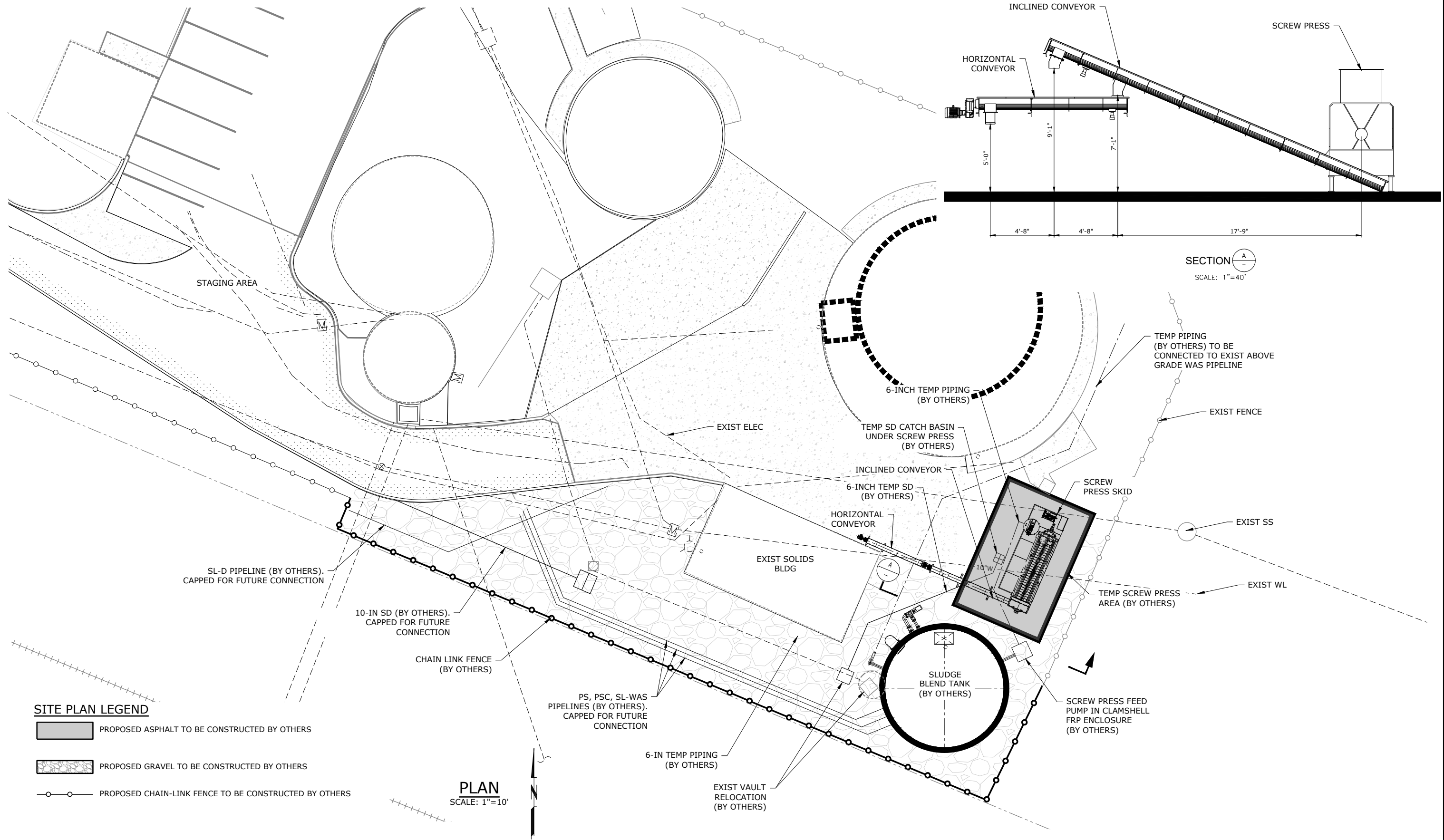
PROJECT NO.: 936-50-21-09 SCALE: AS SHOWN DATE: DECEMBER 2022

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2 of 3

P:\Clients\936 City Of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\DeWatering Equip Pre-Purch\19-2605-OR-C-SITE-DW-DW-PP.dwg C-020 12/15/2022 4:36 PM BBARRY 24.1s (LMS Tech)



SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL TO BE CONSTRUCTED BY OTHERS
- PROPOSED CHAIN-LINK FENCE TO BE CONSTRUCTED BY OTHERS

PLAN
SCALE: 1"=10'

SECTION A
SCALE: 1"=40'

NO.	DATE	BY	REVISION

NOTICE

0 1/2 1

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BVB DRAWN
WJM CHECKED

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MAHLER WRF
OWNER-PROVIDED
DEWATERING EQUIPMENT
PROCUREMENT

SOLIDS AREA DETAIL PLAN

PROJECT NO.: 936-50-21-09 SCALE: AS SHOWN DATE: DECEMBER 2022

SHEET

C-020

3 of 3

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GENERAL INSTRUMENT SYMBOLS

LOCATION/ACCESSIBILITY	DISCRETE INSTRUMENTS	SHARED DISPLAY AND CONTROL (DCS)	PLC	DISCRETE HARDWARE INTERLOCK
FIELD MOUNTED 1. FIELD OR LOCALLY MOUNTED. 2. ACCESSIBLE TO AN OPERATOR AT DEVICE.				
PRIMARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR 1. CENTRAL OR MAIN CONTROL ROOM. 2. FRONT OF MAIN PANEL OR CONSOLE MOUNTED. 3. VISIBLE ON VIDEO DISPLAY. 4. ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.				
PRIMARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR 1. CENTRAL OR MAIN CONTROL ROOM. 2. REAR OF PANEL OR CABINET MOUNTED. 3. NOT VISIBLE ON VIDEO DISPLAY. 4. NOT NORMALLY ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.				
AUXILIARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR 1. SECONDARY OR LOCAL CONTROL ROOM. 2. FIELD OR LOCAL CONTROL PANEL. 3. FRONT OF SECONDARY OR LOCAL PANEL MOUNTED. 4. VISIBLE ON VIDEO DISPLAY. 5. ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.				
AUXILIARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR 1. SECONDARY OR LOCAL CONTROL ROOM. 2. FIELD OR LOCAL CONTROL PANEL. 3. REAR OF SECONDARY OR LOCAL PANEL OR CABINET MOUNTED. 4. NOT VISIBLE ON VIDEO DISPLAY. 5. NOT NORMALLY ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.				

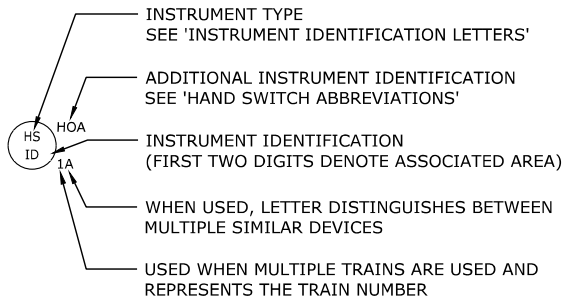
ABBREVIATIONS

AB	AERATION BASIN	MTL	MATERIAL
AG	ABOVE GROUND	MCC	MOTOR CONTROL CENTER
ATM	ATMOSPHERE	MCP	MAIN CONTROL PANEL
BL	BATTERY LIMIT	MIN	MINIMUM
BTL	BOTTOM TANGENT LINE	MOV	MOTOR OPERATED VALVE
BYP	BYPASS	MW	MANWAY
CC	CHEMICAL CLEANOUT	NC	NORMALLY CLOSED
CL	CENTERLINE	NNF	NORMALLY NO FLOW
CO	CLEANOUT	NO	NORMALLY OPEN
CONN	CONNECTION	NOZ	NOZZLE
CSC	CAR SEAL CLOSED	O/C	OPEN/CLOSE
CSO	CAR SEAL OPEN	O/O	ON/OFF
CTR	CENTER	OIT	OPERATOR INTERFACE TERMINAL
DCS	DISTRIBUTED CONTROL SYSTEM	OP	OUTPUT
DES	DESIGN	OSBL	OUTSIDE BATTERY LIMITS
DIA	DIAMETER	OVHD	OVERHEAD
DP	DESIGN PRESSURE	PECS	PRIMARY EFFLUENT CONTROL STRUCTURE
D/P	DIFFERENTIAL PRESSURE	PC	PRIMARY CLARIFIER
DRN	DRAIN	PICS	PRIMARY INFLUENT CONTROL STRUCTURE
DT	DESIGN TEMPERATURE	PLC	PROGRAMMABLE LOGIC CONTROLLER
DWG	DRAWING	PRESS	PRESSURE
(E)	EXISTING	PV	PROCESS VARIABLE
EL	ELEVATION	(R)	RELOCATED
ESD	EMERGENCY SHUTDOWN	REQD	REQUIRED
FOF	FACE OF FLANGE	RIO	REMOTE IO PANEL
(F)	FURNISHED	RTD	RESISTANCE TEMPERATURE DETECTOR
FC	FAIL CLOSED	SC	SECONDARY CLARIFIER
FI	FAIL INDETERMINATE	SCH	SCHEDULE
FL	FAIL LOCKED (LAST POSITION)	SD	SHUTDOWN
FLG	FLANGE	SG	SPECIFIC GRAVITY
FO	FAIL OPEN	SIS	SAFETY INSTRUMENTED SYSTEM
FP	FULL PORT	SO	STEAM OUT
FV	FULL VACUUM	SP	SET POINT
GO	GEAR OPERATED	SS	STAINLESS STEEL S/S START/STOP
GR	GRADE	STD	STANDARD
HC	HOSE CONNECTION	T/C	THERMOCOUPLE
HDR	HEADER	TDH	TOTAL DIFFERENTIAL HEAD
HH	HAND HOLE	TEMP	TEMPERATURE
HOA	HAND/OFF/AUTOMATIC	THRD	THREADED
HP	HIGH PRESSURE	TYP	TYPICAL
HPT	HIGH POINT	UG	UNDERGROUND
IAS	INSTRUMENT AIR SUPPLY	UV	ULTRAVIOLET
ISBL	INSIDE BATTERY LIMITS	UVT	ULTRAVIOLET TRANSMITTANCE
LC	LOCKED CLOSED	UVI	ULTRAVIOLET INTENSITY
LCP	LOCAL CONTROL PANEL	VNT	VENT
LO	LOCKED OPEN	VAC	VACUUM
LP	LOW PRESSURE	VB	VORTEX BREAKER
LPT	LOW POINT	VFD	VARIABLE FREQUENCY DRIVE
MAX	MAXIMUM	W/	WITH
MLCS	MIXED LIQUOR CONTROL STRUTURE	W/O	WITHOUT

INSTRUMENT IDENTIFICATION LETTERS

FIRST LETTER			SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, FLAME, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE (TYPICALLY CONDUCTIVITY - ELECTRICAL)			CONTROL, COMMAND	CLOSED
D	USER'S CHOICE (TYPICALLY DENSITY OR SPECIFIC GRAVITY)	DIFFERENTIAL			DIVERT
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE OR GAUGING (DIMENSIONAL)		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE (TYPICALLY MOISTURE OR HUMIDITY)	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY OR HEAT DUTY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	THROUGH
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE, TORQUE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TYPICAL INSTRUMENT TAG NUMBERS & DESIGNATION



HAND SWITCH ABBREVIATIONS

AO = AUTO/OFF	LOS = LOCKOUT/STOP
AM = AUTO/MANUAL	LA = LOCAL/AUTO
CM = COMPUTER/MANUAL	LR = LOCAL/REMOTE
CL = COMPUTER LOCAL	OC = OPEN/CLOSE
ES = EMERGENCY STOP	OCA = OPEN/CLOSE/AUTO
FR = FORWARD/REVERSE	OO = ON/OFF
FOR = FORWARD/OFF/REVERSE	OOA = ON/OFF/AUTO
FS = FAST/SLOW	OSC = OPEN/STOP/CLOSE
FOS = FAST/OFF/SLOW	RES = RESET
HOA = HAND/OFF/AUTOMATIC	RSL = RAISE/STOP/LOWER
LLS = LEAD/LAG/STANDBY	SS = START/STOP
LO = LOCAL/OFF	SOR = START/OFF/RESET
LOC = LOCAL/OFF/COMPUTER	V/B = VFD/BYPASS
LOR = LOCAL/OFF/REMOTE	

PIPING LINE SYMBOLS

PRIMARY (AG & UG)	
SECONDARY / UTILITY (AG & UG)	
FUTURE OR EXISTING ON NEW P&IDs	
JACKETED OR DOUBLE CONTAINMENT	
NOT A PIPE	

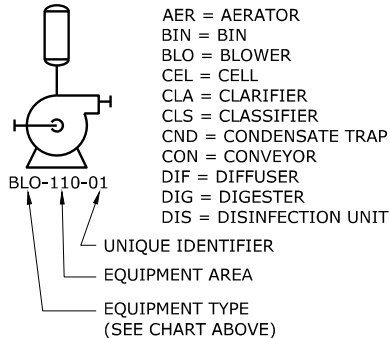
INSTRUMENT LINE SYMBOLS

INSTRUMENT SUPPLY OR CONNECTION TO PROCESS	
PNEUMATIC SIGNAL	
ELECTRIC SIGNAL (ANALOG)	
ELECTRIC SIGNAL (DISCRETE)	
HYDRAULIC SIGNAL	
CAPILLARY TUBE	
ELECTROMAGNETIC, SONIC, OPTICAL, OR NUCLEAR SIGNAL	
SOFTWARE OR DATA LINK	
MECHANICAL LINK	

FLOW STREAM IDENTIFIERS

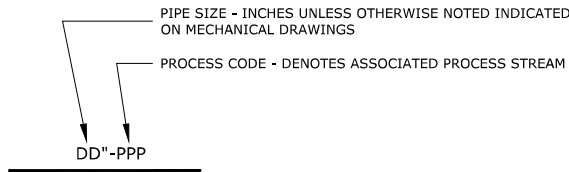
ATM = ATMOSPHERIC AIR	PI = PRIMARY INFLUENT
BS = BLENDED SLUDGE	POL = POLYMER
CAS = CAUSTIC SODA	PS = PRIMARY SLUDGE
DB = DIGESTER BYPASS	PSCM = PRIMARY SCUM
DE = DECANT	PT = PRESSATE
DG = DIGESTER GAS	PW = POTABLE WATER
DR = DRAIN	RAS = RETURN ACTIVATED SLUDGE
DS = DIGESTER SOLIDS	RD = RECYCLE/DRAIN
FA = FOUL AIR	RS = RAW SEWAGE
FBW = FILTER BACKWASH	SCRN = SCREENINGS
FE = FINAL EFFLUENT	SE = SECONDARY EFFLUENT
FT = FILTRATE	SSCM = SECONDARY SCUM
GR = GRIT	STM = STORM
HW = HOT WATER	TBS = THICKENED BLENDED SLUDGE
ML = MIXED LIQUOR	TE = TERTIARY EFFLUENT
OF = OVERFLOW	UW = UTILITY WATER
PA = PROCESS AIR	WAS = WASTE ACTIVATED SLUDGE
PE = PRIMARY EFFLUENT	

TYPICAL EQUIPMENT TAG NUMBERS & DESIGNATION



AER = AERATOR	FED = FEEDER
BIN = BIN	FLT = FILTER
BLO = BLOWER	HEX = HEAT EXCHANGER
CEL = CELL	MIX = MIXER
CLA = CLARIFIER	PMP = PUMP
CLS = CLASSIFIER	PRS = PRESS
CND = CONDENSATE TRAP	SCN = SCREEN
CON = CONVEYOR	SMP = SUMP
DIF = DIFFUSER	THK = THICKENER
DIG = DIGESTER	TNK = TANK
DIS = DISINFECTION UNIT	WEL = WET WELL

PIPELINE IDENTIFICATION DESCRIPTION



OFF-PAGE CONNECTORS AND TIE-IN SYMBOL

A. OFF-PLOT CONNECTOR

CONNECTOR NUMBER

XX

P&ID No

ORIGIN/DESTINATION

B. PRIMARY/SECONDARY LINES AND INSTRUMENT SIGNAL CONNECTOR

CONNECTOR NUMBER

XX

P&ID No

ORIGIN /DESTINATION

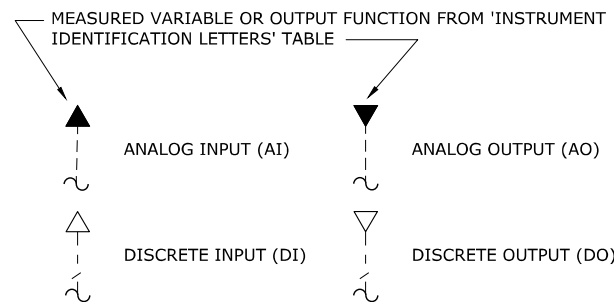
C. UTILITY CONNECTOR

CONNECTOR NUMBER

XX

P&ID No

INPUT / OUTPUT SIGNALS



DRAIN CONNECTORS

CLOSED DRAIN	OPEN DRAIN
CONNECTOR NUMBER	CONNECTOR NUMBER
DESTINATION LINE SERVICE CODE	DESTINATION LINE SERVICE CODE
CLOSED DRAIN (NO P&ID)	OPEN DRAIN (NO P&ID)
DESTINATION LINE SERVICE CODE	DESTINATION LINE SERVICE CODE

NO.	DATE	BY	REVISION

NOTICE
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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DESIGNED
AT
DRAWN
WJS
CHECKED

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MAHLER WRF
OWNER-PROVIDED
DEWATERING EQUIPMENT
PROCUREMENT

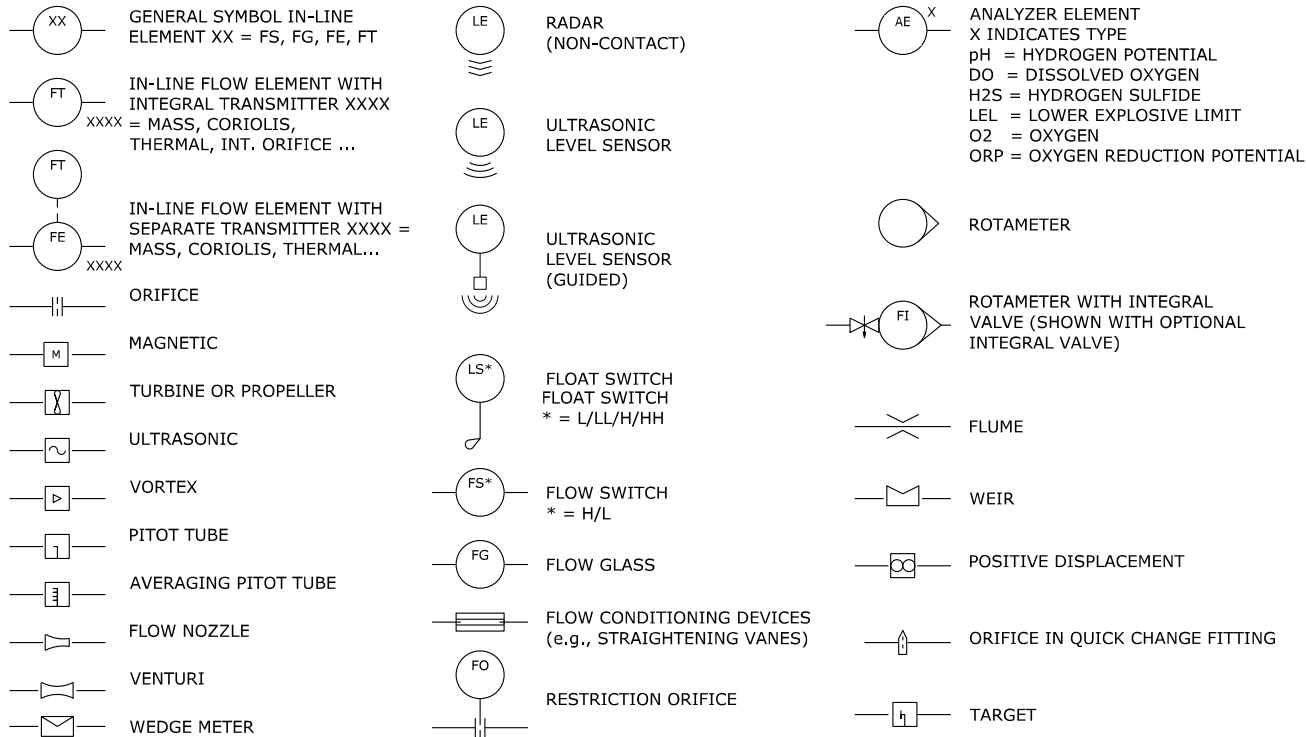
LEGEND, SYMBOLS AND ABBREVIATIONS 1

PROJECT NO.: 936-50-21-09 SCALE: AS SHOWN DATE: SEPTEMBER 2022

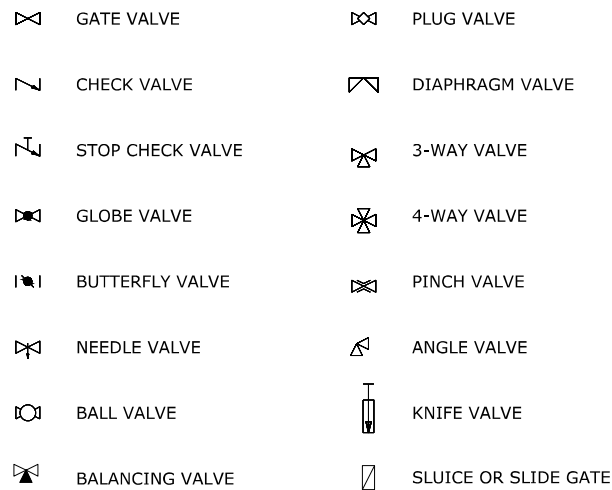
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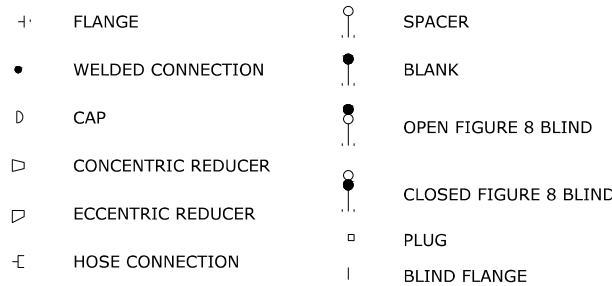
PRIMARY ELEMENT SYMBOLS



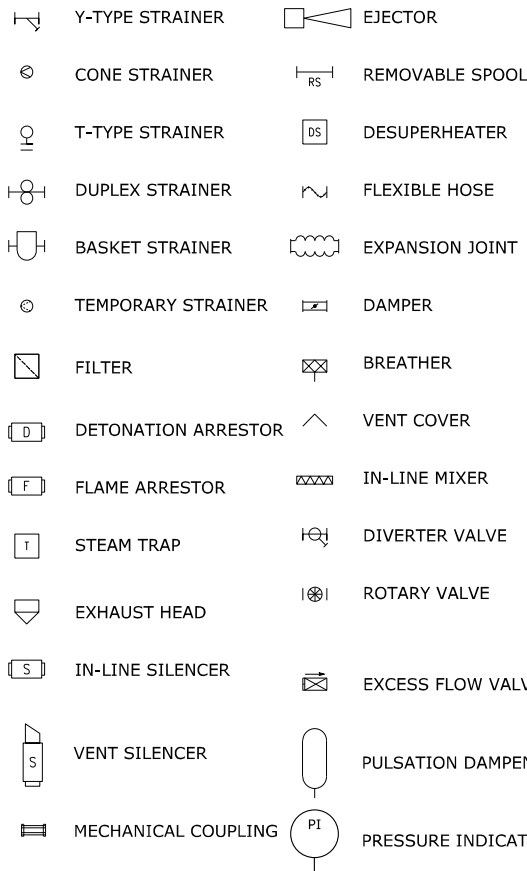
VALVE SYMBOLS (N.C. WHEN SHADED)



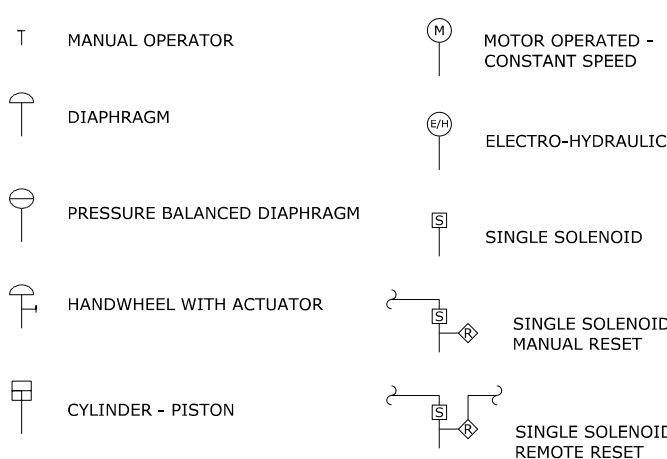
PIPING FITTINGS



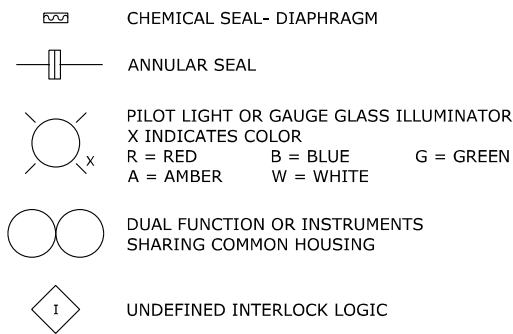
PIPING SPECIALTY ITEMS



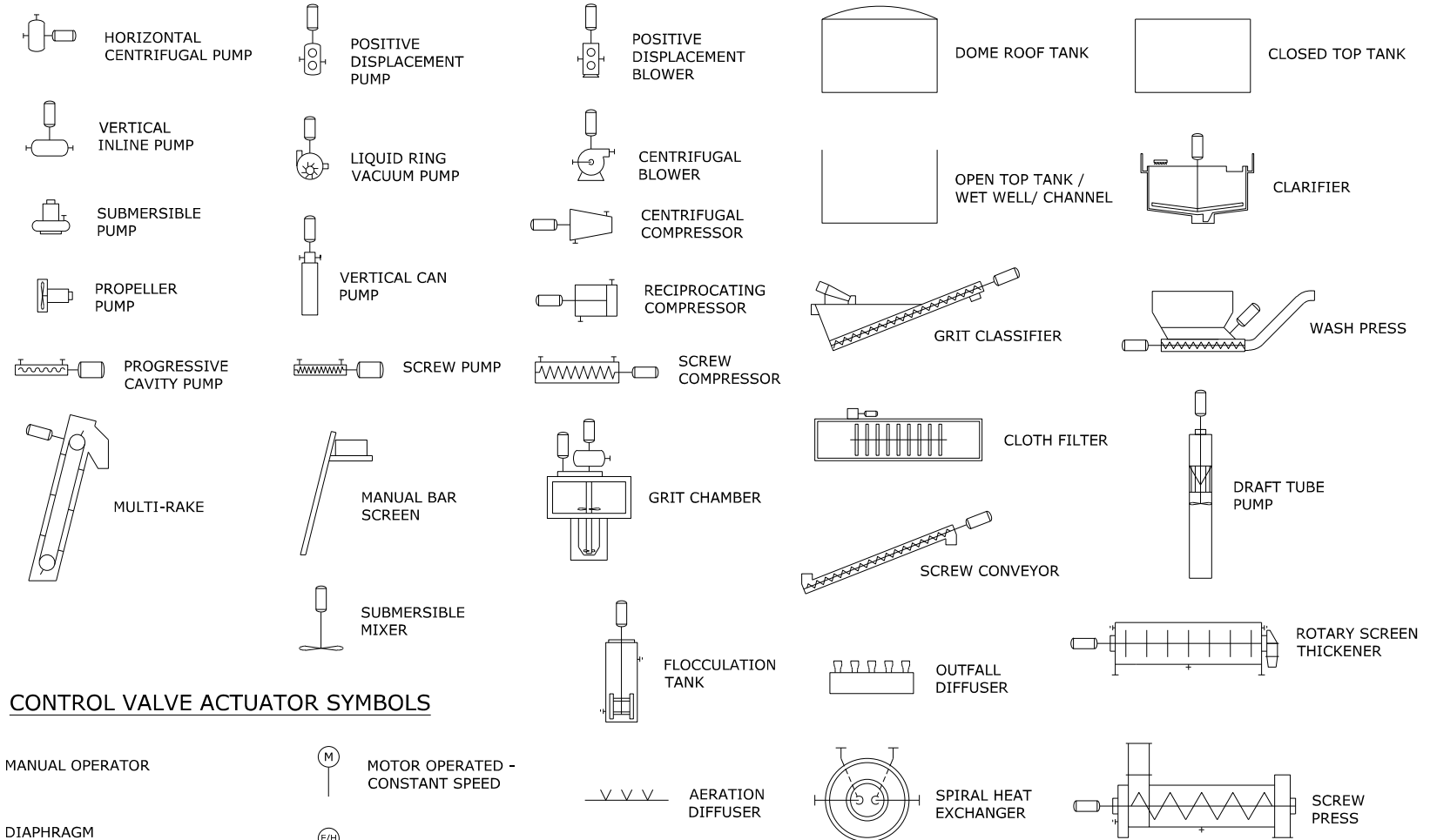
CONTROL VALVE ACTUATOR SYMBOLS



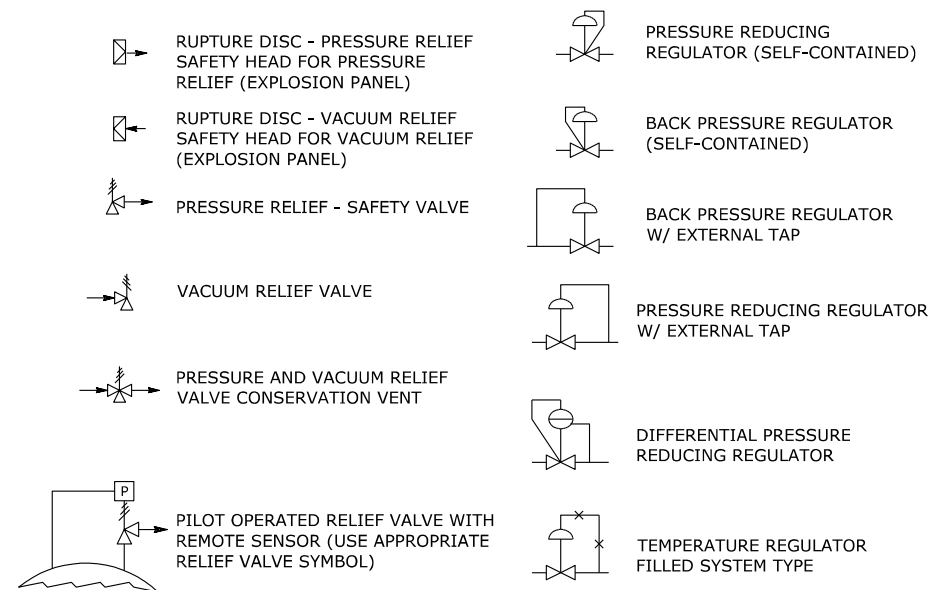
MISCELLANEOUS INSTRUMENT SYMBOLS



PROCESS EQUIPMENT



SELF-ACTUATED DEVICES



NO.	DATE	BY	REVISION

NOTICE

0 1/2 1

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Oregon
"it's best!"

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DEWATERING EQUIPMENT
PROCUREMENT

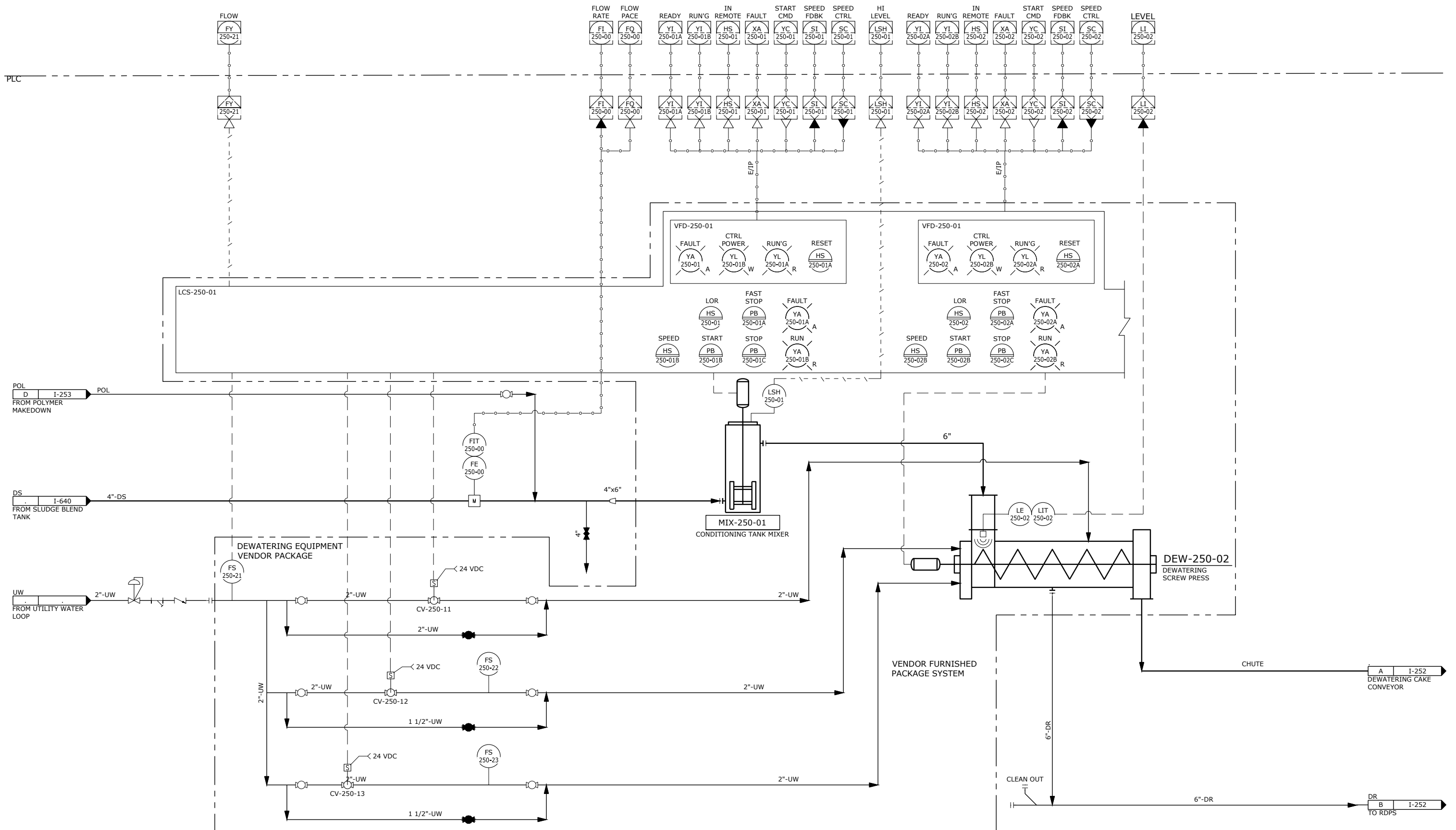
LEGENDS, SYMBOLS AND ABBREVIATIONS 2

PROJECT NO.: 936-50-21-09 SCALE: AS SHOWN DATE: SEPTEMBER 2022

SHEET

I-002

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NO.	DATE	BY	REVISION

NOTICE

0 $\frac{1}{2}$ 1



IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MB
DESIGNED
AT
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CHECKED

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION

SEPT 2022

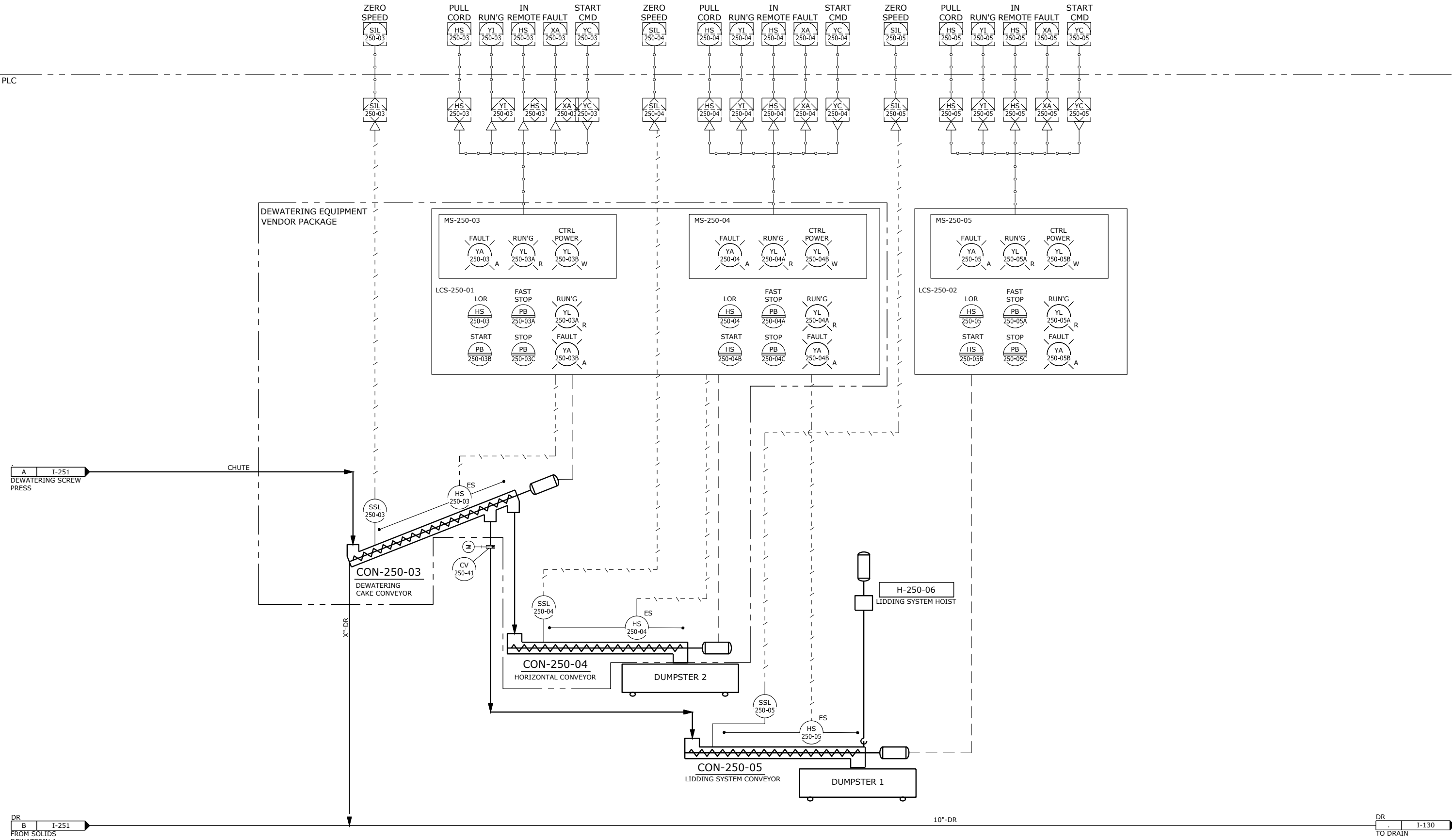
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MAHLER WATER
RECLAMATION FACILITY
IMPROVEMENT PROJECT

SOLIDS DEWATERING 1

PROJECT NO.: 936-50-21-09	SCALE: AS SHOWN	DATE: SEPTEMBER 2022
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DR
B I-251
FROM SOLIDS
DEWATERIN 1

10"-DR

DR
I-130
TO DRAIN

I-252.dwg I-252 12/15/2022 9:16 AM AARON

NO.	DATE	BY	REVISION

NOTICE
0 1/2 1
IF THIS BAR DOES
NOT MEASURE 1"
THEN DRAWING IS
NOT TO SCALE

MB
DESIGNED
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SEPT 2022
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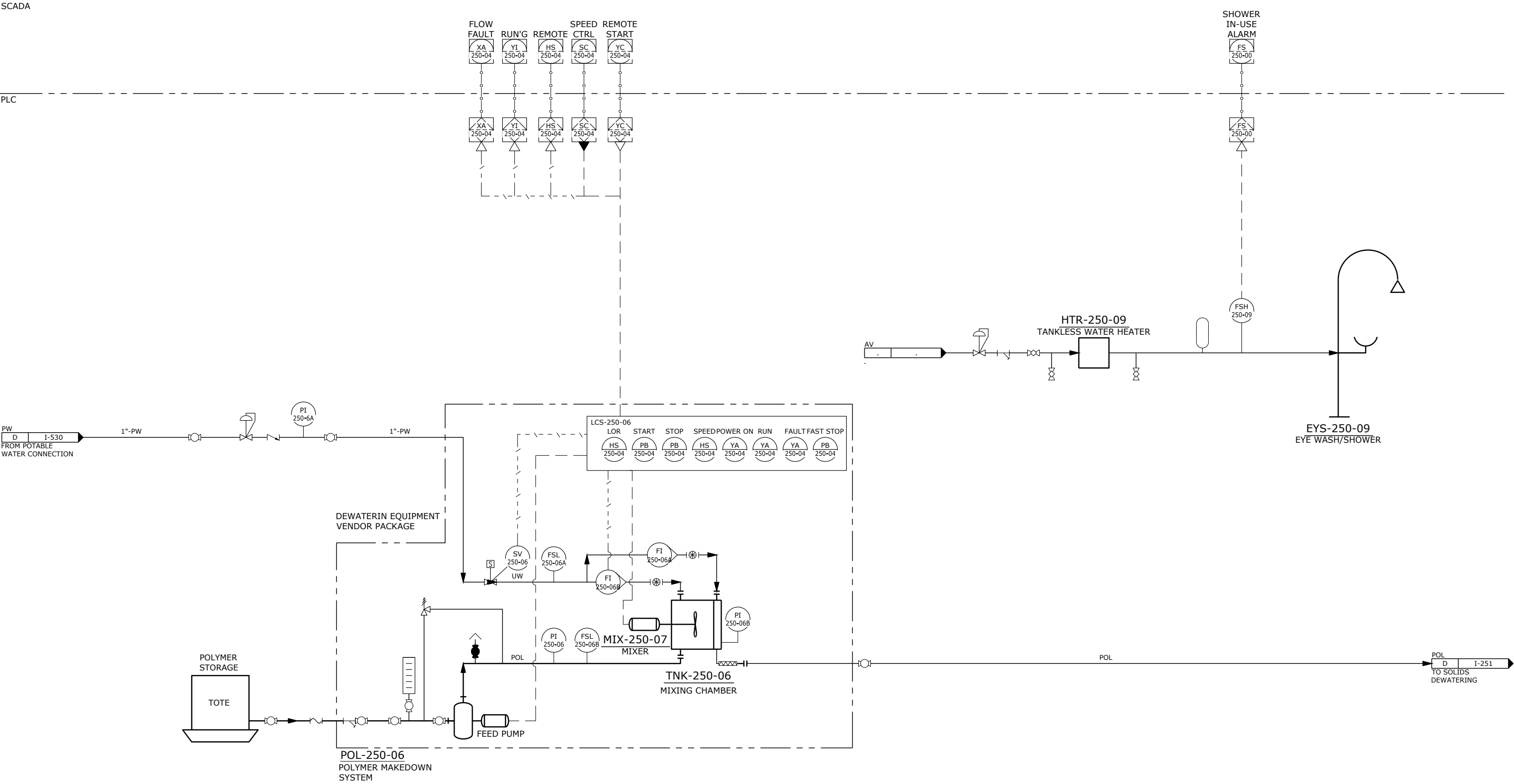


SOLIDS DEWATERING 2
PROJECT NO.: 936-50-21-09 SCALE: AS SHOWN DATE: SEPTEMBER 2022

SHEET
I-252
- of ###

SCADA

PLC



I-253.dwg I-253 12/6/2022 3:00 PM AARON

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NO.	DATE	BY	REVISION

NOTICE
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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CHECKED

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SEPT 2022
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MAHLER WATER
RECLAMATION FACILITY
IMPROVEMENT PROJECT

POLYMER MAKEDOWN
PROJECT NO.: 936-50-21-09
SCALE: AS SHOWN
DATE: SEPTEMBER 2022

SHEET
I-253
- of ###