EMMETT PUBLIC WORKS DEPARTMENT
601 East 3rd Street - Emmett, Idaho 83617
Clint Seamons, Public Works Director

Tuesday, March 17, 2020

Mayor, City Council:

I am requesting from City Council a **MOTION to approve Notice of Award to Huber technology for Wastewater Treatment Plant Influent Fine Screen Project in the amount of 178,500.00 with Mayor to Sign.**

Attached is the Invitation to BID contract documents & Specifications, Notice of Award and two decline to BID emails for your review.

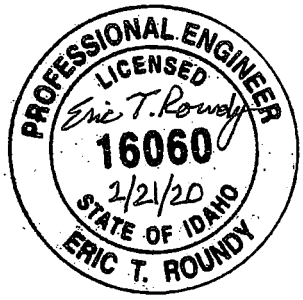
Thank you,

Clint Seamons
Public Works Director

Contract Documents & Specifications

CITY OF EMMETT
WWTP INFLUENT FINE SCREEN

Volume 1 of 2
Division 00 – Division 46



FEBRUARY 2020

PROJECT NO.210022-051

PREPARED BY:

KELLER

131 SW 5th Ave, Suite A
Meridian, ID 83642
(208) 288-1992

PREPARED FOR:

501 E Main St
Emmett, ID 83617
(208) 365-6050

TABLE OF CONTENTS

BIDDING DOCUMENTS

SECTION 00030
NOTICE INVITING BIDS

Sealed Bids for furnishing an Influent Fine Screen will be received by the City of Emmett (Buyer or Owner) at the following location:

City of Emmett
601 E. 3rd St.
Emmett, ID 83617

Bids will be accepted until 11:00 AM Local Mountain Time, on March 12, 2020. Bids and Vendor Performance Questionnaires shall each be sealed in separate packages. Buyer shall make a decision on award within 60 days.

The Project consists of the following:

Furnish influent fine screen equipment as specified in the contract documents and specifications. Installation of the equipment may be bid separately to Installation Contractors or installed by the Owner. The Owner will assign the agreement with Vendor (Seller) to the selected Installation Contractor, if desired. If applicable, the Seller shall be responsible for coordinating all activities after the assignment directly with the selected Installation Contractor.

Additional copies of the Contract Documents and Bid Documents may be obtained at the office of Keller Associates, Inc., Meridian Office, 131 SW 5th Avenue, Suite A, Meridian, ID 83642. Contract Documents and Bid Documents will be issued on CD or via email (PDF) at no cost to bidders.

Questions shall be referred to the Project Engineer: Mr. Eric Roundy - Keller Associates, Inc. at (208) 288-1992 or via email at eroundy@kellerassociates.com.

All bids will be opened and evaluated based on the criteria provided in the bid forms.

Each proposal must be submitted on the prescribed forms and accompanied by a certified cashier's check or a corporate bid bond executed on the prescribed form, payable to the City of Emmett, in an amount not less than five percent (5%) of the base bid amount. The successful Bidder will be required to furnish Performance and Payment Bonds with the Purchase Order Agreement, each in the amount of not less than 100% of the contract price.

The Buyer reserves the right to waive any informality or to reject any or all Bid Proposals, if it is in the best interest of the Buyer.

City of Emmett

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - GENERAL INFORMATION

1.01 The following instructions outline the procedure for preparing and submitting bids. Bidders must fulfill all requirements as specified in these Contract Documents.

ARTICLE 2 - DEFINED TERMS

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

A. *Bidder* – Equipment vendors submitting a bid.

B. *Buyer or Owner* – City of Emmett, 601 E. 3rd St., Emmett, ID 83617, Telephone: (208) 365-9569.

C. *Engineer* – Keller Associates, Inc., 131 SW 5th Avenue, Meridian, ID 83642, Telephone: (208) 288-1992.

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

E. *Vendor* – Vendor shall have the same definition as *Seller* in the General Conditions.

ARTICLE 3 - BIDS RECEIVED

3.01 Refer to Notice Inviting Bids for information on receipt of Bids.

ARTICLE 4 - COPIES OF BIDDING DOCUMENTS

4.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the advertisement or invitation to bid may be obtained from the Issuing Office.

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

4.03 Buyer and Engineer have made copies of Bidding Documents available on the above terms only for the purpose of obtaining Bids for furnishing Goods and Special Services and do not authorize or confer a license for any other use.

ARTICLE 5 - QUALIFICATIONS OF BIDDERS

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

ARTICLE 6 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND POINT OF DESTINATION

6.01 Upon request Buyer will provide Bidder access to the Point of Destination and the site where Goods are to be installed or Special Services are to be provided so that Bidder may conduct

such investigations, examinations, tests, and studies as Bidder deems necessary for submission of a Bid.

6.02 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, including any Addenda, and the related data identified in the Bidding Documents;

B. visit the Point of Destination and the site where the Goods are to be installed and Special Services are to be provided to become familiar with the local conditions if required by the Bidding Documents to do so, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services;

C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, or the furnishing of the Goods and Special Services;

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

E. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution (if any) thereof by Engineer is acceptable to Bidder; and

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

6.03 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 6, that without exception the Bid is premised upon furnishing Goods and Special Services required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions (if any) thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only answers in

the Addenda will be binding. Oral statements, interpretations, and clarifications may not be relied upon and will not be binding or legally effective.

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

ARTICLE 8 - BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Buyer in an amount of 5% percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid Bond (on form attached) issued by a surety meeting the requirements of Paragraph 4.01.B of the General Conditions.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Buyer may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders that Buyer believes to have a reasonable chance of receiving the award may be retained by Buyer until the earlier of 7 days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

ARTICLE 9 - CONTRACT TIMES

9.01 See applicable provisions in the Agreement.

ARTICLE 10 - LIQUIDATED DAMAGES

10.01 Any provisions for liquidated damages are set forth in the Agreement.

ARTICLE 11 - "OR-EQUAL" ITEMS

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

ARTICLE 12 - PREPARATION OF BID

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

12.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each item listed therein. In the case of optional alternates the words "No Bid," "No Change," or "Not Applicable" may be entered.

12.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The

corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

12.04 A Bid by a partnership shall 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 shall be shown.

12.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

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

12.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

12.08 All names must be typed or printed in ink below the signature.

12.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

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

ARTICLE 13 - BASIS OF BID; COMPARISON OF BIDS

13.01 Lump Sum

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

B. For determination of the apparent low Bidder, Bids will be compared on the basis of the lump sum.

ARTICLE 14 - SUBMITTAL OF BID

14.01 With each copy of the Bidding Documents, a Bidder is furnished one separate electronic copy of the Bid Form, and, if required, the Bid Bond. The copy of the Bid Form is to be completed and submitted with the Bid security. Also submit the following documents:

A. Required Vendor Performance Questionnaire.

14.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid, and shall be enclosed in a plainly marked envelope with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and the name and address of Bidder, and shall 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 shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED". A mailed Bid shall be addressed to City of Emmett, 601 E. 3rd St., Emmett, ID 83617.

14.03 The Bid Form can be provided electronically (Microsoft Word format), upon request. The electronic document shall only be used to complete the bid form; neither content nor format

shall be manipulated in any way. Any necessary corrections to these documents resulting from Addenda shall warrant the reissuance of these electronic documents by the Engineer.

ARTICLE 15 - MODIFICATION OR WITHDRAWAL OF BID

15.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

15.02 Any Bidder may modify its bid by telegraphic, fax, or written communication at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the Buyer prior to the closing time. Telegraphic, faxed, or written communication should not reveal the bid price; it should however, state the addition or subtraction or other modification so that the final prices or terms will not be known by the Buyer until the sealed bid is opened. It is the sole responsibility of the Bidder to see that any modification to its bid is received at the time and place stated in the Notice Inviting Bids.

ARTICLE 16 - OPENING OF BIDS

16.01 Bids will be opened privately.

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 Buyer 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 Buyer reserves the right to reject any and all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Buyer further reserves the right to reject the Bid of any Bidder that Buyer finds, after reasonable inquiry and evaluation, to be nonresponsible. Buyer may also reject the Bid of any Bidder if Buyer believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Buyer. Buyer also reserves the right to waive all informalities not involving price, time, or changes in the Goods and Special Services, and to negotiate contract terms with the Successful Bidder. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

18.02 More than one Bid for the same Goods and Special Services from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Goods and Special Services shall be

cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

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

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

18.05 If the Contract is to be awarded, Buyer will award the Contract to the Bidder whose equipment meets the requirements of the specifications and is the lowest cost.

ARTICLE 19 - CONTRACT SECURITY AND INSURANCE

19.01 Article 4 of the General Conditions and Article 4 of the Supplementary Conditions set forth Buyer's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Buyer, it must be accompanied by such bonds.

ARTICLE 20 - SIGNING OF AGREEMENT

20.01 When Buyer issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents that are to be identified in the Agreement and attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Buyer.

ARTICLE 21 - SALES AND USE TAXES

21.01 Any applicable state sales and use taxes on materials and equipment to be incorporated in the Project shall be paid by the Installation Contractor or Owner. Said taxes shall not be included in the Bid.

ARTICLE 22 - ARTICLE 22 - CONTRACT TO BE ASSIGNED

22.01 Bidder's attention is directed to the provisions of Paragraph 11.02 of the Agreement which provide for the assignment of the Contract to an Installation Contractor designated by the Buyer to construct the improvements. Bidder should consider the application of the terms and conditions of the Contract Documents after assignment and is advised of the duty to continue to perform the Contract after it has been assigned to the Installation Contractor. Timing of the assignment is set forth in the Agreement. Forms documenting the assignment of the Contract and for the agreement of the Seller's surety to such assignment are included as attachments to the Agreement.

BID FORM

PROJECT IDENTIFICATION: City of Emmett

Influent Fine Screen Equipment Pre-Purchase

CONTRACT IDENTIFICATION NUMBER:

1.01 This Bid is submitted to: **City of Emmett**

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

ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

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

2.02 Bidder acknowledges that this Contract, if awarded, may be assigned by the Owner to the Installing Contractor, and hereby consents to the assignment under the terms and conditions of the Pre-Purchase Documents.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

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

Date	Number	Initials
_____	_____	_____
_____	_____	_____
_____	_____	_____

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

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

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

E. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution (if any) thereof by Engineer is acceptable to Bidder.

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

ARTICLE 4 - BIDDER'S CERTIFICATIONS

4.01 Bidder certifies that:

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

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

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

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

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

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Buyer, (b) to establish bid prices at artificial 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.

ARTICLE 5 - BASIS OF BID

5.01 Bidder will furnish the Goods and Special Services in accordance with the Contract Documents for the following price. (Lump Sum Bid Price shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern):

Lump Sum Bid Price	$

_____

(written in words)

ARTICLE 6 - TIME OF COMPLETION

6.01 Bidder agrees that the furnishing of Goods and Special Services will conform to the schedule set forth in Article 5 of the Agreement.

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

ARTICLE 7 - ATTACHMENTS TO THIS BID

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

A. Required Bid security in the form of _____.

B. Vendor Performance Questionnaire.

ARTICLE 8 - DEFINED TERMS

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

ARTICLE 9 - BID SUBMITTAL

9.01 This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

_____

By: _____

_____

(Individual's signature)

Doing business as: _____

Business address: _____

_____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

A Partnership

Partnership Name: _____

(SEAL)

By: _____

(Signature of general partner - attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

A Corporation

Corporation Name: _____

_____

State of Incorporation: _____

Type (General Business, Professional, Service, other): _____

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest _____

(Signature of Corporate Secretary)

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

A Limited Liability Company (LLC)

LLC Name: _____

State in which organized: _____

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

A Joint Venture

First Joint Venturer Name: _____

(SEAL)

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

Second Joint Venturer Name: _____

_____(SEAL)

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

Phone and Facsimile Number, and Address for receipt of official communications to Joint Venture: _____

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, corporation, and limited liability company that is a party to the joint venture should be in the manner indicated above.)

BID BOND (Penal Sum Form)

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

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

OWNER *(Name and Address)*:

BID

Bid Due Date:

Description *(Project Name— Include Location)*:

BOND

Bond Number:

Date:

Penal sum _____ $ _____

(Words) (Figures)

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

BIDDER	**SURETY**
_____ (Seal)	_____ (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
Title	Title

Note: Addresses are to be used for giving any required notice.
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 shall be Owner's sole and exclusive remedy upon default of Bidder.

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

3. This obligation shall be null and void if:

3.1 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 shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

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

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

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

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

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

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

VENDOR PERFORMANCE QUESTIONNAIRE

1.0 GENERAL

A. This Section lists the submittal requirements for the Qualifications Proposal. The purpose of the submitted information will be to provide Buyer and Engineer with the necessary information to judge a Seller's minimum qualifications and to assist in evaluating sellers for basis of award as indicated in Article 18 of Instructions to Bidders.

B. Seller shall submit information and/or responses that address each item below on separate sheets to be submitted in a separate 3-ring binder at the time of Bid Proposal. Each answer shall reference the item number to which the information pertains. If a question is not applicable to a Seller's proposed equipment, then an answer of "Not Applicable" or "N/A" must be provided. Failure to provide the requested information may result in a Bid being judged as nonresponsive.

C. Seller shall provide a separate complete list of all exceptions, or qualifications taken to the Contract Documents or Specifications in Seller's Qualification and Bid Proposal, including, any limitations on Seller's liability. The Seller shall be aware that any exceptions or qualifications to the Contract Documents or Specifications taken may adversely impact the award of the Contract to the Seller.

2.0 SUBMITTAL REQUIREMENTS

A. Seller to submit bound copies of questionnaire per instructions in Section P-030 – Notice Inviting Bids. Submitted Vendor Performance Questionnaire shall be considered the Qualifications Proposal.

B. Qualifications Proposal shall include the following:

1. Identification of Seller, name of project, name of Buyer, and date of submittal.
2. Responses to all questions listed in parts below including: Product Support Services, Experience and References, and pertinent licensing agreements.
3. Provide a complete description of proposed equipment including layout and installation details. Power requirements shall be provided. Description of motors, if any, shall be provided.
4. Provide a complete description of equipment operating and maintenance costs for power, materials and labor hours. Provide a summary of annual maintenance, 5-year maintenance, and 10-year maintenance activities and include estimated labor hours and materials cost for each item of maintenance to help Owner properly evaluate life cycle costs.
5. Indicate and list any and all advantages that Seller's equipment might have over a competitor's equipment. Include information on any extended equipment or media warrantees offered beyond the specified warranty period.
6. Any other information deemed appropriate by Seller to assist Buyer and Engineer in determining Seller qualifications including company brochures, product data sheets, etc.
7. Proposal to be organized with table of contents at the front and tabbed dividers between sections.

3.0 PRODUCT SUPPORT SERVICES

A. Provide examples or document past experience.

B. List of office locations of the WWTP Equipment Manufacturer in North America. Provide location where the equipment is manufactured.

C. List all service/maintenance locations in the United States for the WWTP equipment to be provided. Provide the following for each location:

- Location
- Type of support services provided
- Description of Service Provided by Manufacturer or Subcontractor
- Response Time for Technician to be in Emmett

D. Describe the system start-up and operator training capabilities of the Equipment Manufacturer. In addition, provide resume for installation supervision and start-up personnel.

E. Describe facilities, programs and methods, which the Equipment Manufacturer provides to Owners/operators for ongoing maintenance and trouble-shooting.

F. Provide description of available 24/7 telephone support services, additional operator training after start-up including conferences, available support groups and quarterly site visits.

4.0 MANUFACTURER'S EXPERIENCE AND REFERENCES

A. Attach to this bid, a list of five municipal contracts completed by the Bidder during the last 5 years involving applications for dewatering municipal sludge and of comparable value in North America. The list shall include the following information as a minimum.

- Names, address, and telephone number of Plant operator.
- Name of project.
- Location of project.
- Brief description of the work involved.

B. Identify the year that the Equipment Manufacturer first began manufacturing WWTP Equipment for the treatment of municipal waste activated sludge.

C. Furnish a list of North American Equipment installations for the treatment of municipal waste activated sludge. The following information shall all be provided with each listing:

- Location
- Equipment rated capacity
- Identify system by model or type
- First year of operation (or identify as under construction)

D. Identify which of the North American installations utilize the manufacturer's same model/type anticipated for the City of Emmett.

5.0 VENDOR LICENSING AGREEMENTS

A. Attach to this bid, a copy of the manufacturer's licensing agreement for the WWTP equipment technology, if existing, listing commencement and termination dates and all existing contractual arrangements related to the licensing agreement.

END SECTION P-500

CONTRACT FORMS

AGREEMENT

THIS AGREEMENT is by and between The City of Emmett ("Buyer") and

_____ ("Seller").

Buyer and Seller hereby agree as follows:

ARTICLE 1 – GOODS AND SPECIAL SERVICES

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

ARTICLE 2 – THE PROJECT

2.01 Seller (Vendor) shall complete the Goods and Services as specified or indicated in the Buyer's Contract Document and Specifications titled, "City of Emmett Influent Fine Screen Equipment Pre-Purchase".

2.02 The Project, of which the Goods and Services may be the whole or only a part, is described as performing or providing all labor, services, engineering, manufacturing, testing, and documentation necessary for Installation Contractor or Owner to install and successfully start-up the influent fine screen.

2.03 The Goods and Services are generally described as follows:

A. Influent Fine Screen: Influent fine screen for removing large solids from wastewater stream in Headworks along with required controls.

B. Submittals: The fine screen equipment Vendor will provide design of the Goods, submittal of the shop drawings and samples, general arrangement drawings of equipment, and a control strategy description; will participate in meetings and assist Engineer during the design; and will make changes to equipment system as required to coordinate the design with the Engineer during the submittal review process.

C. Start-up and Training: Provide complete start-up services. Detailed operation and maintenance manuals and training of the Owner's staff shall also be provided.

ARTICLE 3 – ENGINEER

3.01 The Contract Documents for the Goods and Special Services have been prepared by Keller Associates, Inc. 131 SW 5th Avenue, Meridian, ID 83642 ("Engineer"), which is to act as Buyer's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with Seller's furnishing of Goods and Special Services.

ARTICLE 4 – POINT OF DESTINATION

4.01 The Point of Destination is designated as: 1478 Cascade Rd, Emmett, ID 83617.

ARTICLE 5 – CONTRACT TIMES

5.01 *Time of the Essence*

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

5.02 *Milestones*

A. Days for Submittal of Shop Drawings and Samples: Seller shall submit all Shop Drawings and Samples required by the Contract Documents to Buyer for Engineer's review and approval within 60 days after the date when the Contract Times commence to run as provided in Paragraph 2.04 of the General Conditions. It is the intent of the parties that (1) Engineer conduct such review and issue its approval, or a denial accompanied by substantive comments regarding information needed to gain approval, within 21 calendar days of Seller's submittal of such Shop Drawings and Samples; and (2) resubmittals be limited whenever possible. If more than one resubmittal is necessary for reasons not the fault and beyond the control of Seller, then Seller shall be entitled to seek appropriate relief under Paragraph 7.02.B of the General Conditions.

B. *Days to Achieve Delivery of Goods:* The Goods are to be delivered to the Point of Destination and ready for Buyer's receipt of delivery 140 days after the date when the Contract Times commence to run as provided in Paragraph 2.04 of the General Conditions.

C. *Days for Furnishing Start-Up and Training Services:* The furnishing of start-up services, detailed installation and operation and maintenance manuals, testing services, and operator training shall be coordinated with the Installation Contractor and Owner and provided at the Installation Contractor's or Owner's request within their contract time after the procurement contract has been assigned.

5.03 *Buyer's Final Inspection*

A. Days to Achieve Final Inspection: Buyer shall make its final inspection of the Goods pursuant to Paragraph 8.01.C of the General Conditions within 30 days after Buyer's acknowledgement of receipt of delivery of the Goods and Seller's completion of furnishing Start-Up and Training Services. The final inspection shall be requested by the Installation Contractor and Owner.

5.04 *Liquidated Damages*

A. Buyer and Seller recognize that Buyer will suffer financial loss if the Goods are not delivered at the Point of Destination and ready for receipt of delivery by Buyer within the times specified in Paragraph 5.02 above, plus any extensions thereof allowed in accordance with Article 7 of the General Conditions. 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 requirements of Paragraph 5.02. Further, they recognize the delays, expense, and difficulties involved in proving the actual loss suffered by Buyer if complete acceptable Goods are not delivered on time. Accordingly, instead of requiring such proof, Buyer and Seller agree that as liquidated damages for delay (but not as a penalty) Seller shall pay Buyer $500 for each day that expires after the time specified in Paragraph 5.02.B for delivery of acceptable Goods. Other services provided

by the Seller, such as start-up and training, shall be performed per requirements specified in Article 2 herein, but will not be subject to any liquidated damages. Liquidated damages shall be capped at 10% of the contract price.

ARTICLE 6 – CONTRACT PRICE

6.01 Buyer shall pay Seller for furnishing the Goods and Special Services in accordance with the Contract Documents as follows:

A. The prices stated in Seller's Bid, attached hereto as an exhibit.

ARTICLE 7 – PAYMENT PROCEDURES

7.01 *Submittal and Processing of Payment*

A. Seller shall submit Applications for Payment in accordance with Article 10 of the General Conditions and Section 01 30 10 – Schedule of Payments. Applications for Payment will be processed by Engineer as provided in the General Conditions.

7.02 *Final Payment*

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

ARTICLE 8 – INTEREST

8.01 All monies not paid when due as provided in Article 10 of the General Conditions shall bear interest at the statutory rate.

ARTICLE 9 – SELLER'S REPRESENTATIONS

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

A. Seller has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents, as applicable to Seller's obligations identified in Article 1 above.

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

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

D. Seller has carefully studied, considered, and correlated the information known to Seller; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Seller's visits, if any, to the Point of Destination and site where the Goods are to be installed or Services

will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Contract Documents.

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

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

ARTICLE 10 – CONTRACT DOCUMENTS

10.01 *Contents*

A. The Contract Documents consist of the following:

1. Notice Inviting Bids;
2. Instructions to Bidders;
3. Bid Forms including the required bid security;
4. This Agreement (pages __ to __, inclusive);
5. Performance Bond (pages __ to __, inclusive);
6. Payment Bond (pages ____ to ____, inclusive);
7. Other bonds
   a. _____ (pages __ to ____, inclusive);
   b. _____ (pages __ to __, inclusive);
   c. _____ (pages ___to __, inclusive);
8. General Conditions (pages ___ to ___, inclusive);
9. Supplementary Conditions (pages ___ to ___, inclusive);
10. Specifications as listed in table of contents of the Project Manual;
11. Addenda (Numbers ____ to ____, inclusive);
12. Exhibits to this Agreement (enumerated as follows):
    a. Exhibit A-1 to Agreement between Buyer and Seller dated _____, Assignment of Contract; Consent to Assignment; and Acceptance of Assignment.
    b. Exhibit A-2 to Agreement between Buyer and Seller dated _____, Agreement to Assignment by Seller's Surety.
    c. Seller's Bid, solely as to the prices set forth therein (pages ___ to ___, inclusive);
    d. Documentation submitted by Seller prior to Notice of Award (pages ___ to ___, inclusive);
    e. _____;

13. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
    a. Notice to Proceed;
    b. Change Order(s);
    c. Work Change Directive(s).

B. The documents listed in Paragraph 10.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 10.

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

ARTICLE 11 – MISCELLANEOUS

11.01 *Terms*

A. Terms used in this Agreement will have the meanings indicated in the General Conditions and the Supplementary Conditions.

11.02 *Assignment of Contract*

A. Buyer has the right to assign this Contract for furnishing Goods and Special Services, but only to a person or entity with sufficient ability to satisfy all of Buyer's obligations under this Contract, and Seller hereby consents to such assignment. Forms documenting the assignment of the Contract, and consent of Seller's surety to the assignment, have been executed by Buyer, Seller, and Seller's surety, and are attached as exhibits to this Agreement.

1. The Contract will be executed in the name of Buyer initially and will be assigned to a construction contractor designated by Buyer, if desired. Such construction contractor's responsibilities will include the installation of the Goods. The assignment will occur on the effective date of the agreement between Buyer and the construction contractor, which is expected to occur in Spring 2020. As of the date of acceptance of assignment by the construction contractor, all references in the Contract Documents to Buyer shall mean the designated construction contractor.

2. The assignment of the Contract shall relieve the assignor from all further obligations and liabilities under this Contract. After assignment, Seller shall become a subcontractor or supplier to the assignee and, except as noted herein, all rights, duties, and obligations of Buyer under the Contract shall become the rights, duties, and obligations of the assignee.

3. After assignment:
    a. All performance warranties, guarantees, and indemnifications required by the Contract Documents will continue to run for the benefit of assignor and, in addition, for the benefit of the assignee. However, if assignor and assignee make the same warranty or guarantee claim, then Seller shall only be liable once for such claim.

b. Except as provided in this Paragraph 11.02.A.3.b, all rights, duties, and obligations of Engineer to assignee and Seller under this Contract will cease.

1) Engineer will review Seller's Applications for Payment and make recommendations to assignee for payments as provided in Paragraphs 10.02 and 10.06 of the General Conditions.

2) Upon the written request of either the assignee or Seller, Engineer will issue with reasonable promptness clarifications or interpretations of the Contract Documents pursuant to the terms of Paragraph 9.02.A of the General Conditions.

B. No other assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound. Specifically, but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by Laws and Regulations). Unless specifically stated to the contrary in any written consent to such an assignment, such an assignment will not release or discharge the assignor from any duty or responsibility under the Contract Documents.

11.03 *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 Contract Documents.

11.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Buyer and Seller. The Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

11.05 *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 Contract. For the purposes of this Paragraph 11.05:

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

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

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 Contract.

11.06 *Limitations*

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 Contract. Upon assignment the terms of this Paragraph 11.06.A shall be binding upon the 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) 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, (c) intentional or reckless wrongful conduct, or (d) rights conferred by any bond provided by Seller under this Contract.

B. Upon assignment the terms of this Paragraph 11.06.B shall be binding upon both the assignor and assignee with respect to Seller's liability, and upon Seller with respect to both assignor's and assignee's liabilities. The terms of this mutual limitation 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 with respect to third-party claims, losses, and damages; (b) 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, (c) intentional or reckless wrongful conduct, or (d) rights conferred by any bond provided by Seller under this Contract.

11.07 *Other Provisions*

A. Prior to the Buyer's execution of this Procurement Agreement, Seller shall secure, and shall thereafter maintain until completion of the Contract, such public liability and property damage insurance as shall protect Seller from claims for damages for personal injury, including accidental death, as well as from claims for property damage which may arise from or which may concern operations under the Contract, whether such operations be by or on behalf of Seller, any Subvendor or anyone directly or indirectly employed by, connected with or acting for or on behalf of any of them.

B. All liability insurance shall be issued by an insurance company or companies authorized to transact liability insurance business in the State of Idaho and shall cover comprehensive general and automobile liability for both bodily injury (including death) and property damage, including, but not limited to aggregate products, aggregate operations, aggregate protective and aggregate contractual with the limits as specified in the Supplementary General Conditions.

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

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

Buyer: _____

By: _____
[Corporate Seal]

Attest: _____

Address for giving notice:

_____
_____
_____

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

Designated Representative:
Name: _____
Title: _____
Address: _____
Phone: _____
Facsimile: _____

Seller: _____

By: _____
[Corporate Seal]

Attest: _____

Address for giving notice:

_____
_____
_____

Agent for service of process:

_____
_____
_____
_____

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

Designated Representative:
Name: _____
Title: _____
Address: _____
Phone: _____
Facsimile: _____

EXHIBIT A-1 to Agreement Between Buyer and Seller dated _

ASSIGNMENT OF CONTRACT; CONSENT TO ASSIGNMENT; AND ACCEPTANCE OF ASSIGNMENT

This assignment will be effective on the Effective Date of the Agreement between Buyer and Construction Contractor.

The Contract between the City of Emmett ("Buyer") and _____("Seller") for furnishing Goods and Special Services under the Contract Documents entitled City of Emmett – Influent Fine Screen Equipment Pre-Purchase is hereby assigned, transferred, and set over to _____ ("Construction Contractor"). Construction Contractor shall be totally responsible for the performance of Seller and for the duties, rights and obligations of Buyer, not otherwise retained by Buyer, under the terms of the Contract between Buyer and Seller.

ASSIGNMENT DIRECTED BY:

_____
Buyer

(If Buyer is a corporation, attach evidence of authority to sign. If Buyer is a public body, attach evidence of authority to sign

By: _____
(Signature) (Title)

and resolution or other documents authorizing execution of Buyer-Seller Agreement.)

ASSIGNMENT ACKNOWLEDGED AND ACCEPTED BY:

_____
Seller

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

By: _____
(Signature) (Title)

ASSIGNMENT ACCEPTED BY:

_____
Construction Contractor

(If Construction Contractor is a corporation, attach evidence of authority to sign.)

By: _____

EXHIBIT A-2 to Agreement Between Buyer and Seller dated _____.

AGREEMENT TO ASSIGNMENT BY SELLER'S SURETY

Surety hereby acknowledges and agrees that the Contract for furnishing Goods and Special Services under the Contract Documents entitled City of Emmett – Influent Fine Screen Equipment Pre-Purchase by and between the City of Emmett ("Buyer") and _____ ("Seller") may be assigned, transferred, and set over to _____ ("Construction Contractor"), in accordance with Paragraph 11.02 of Agreement between Buyer and Seller.

Surety further agrees that, upon assignment of the Contract, the Construction Contractor shall have all the rights of the Buyer under the Performance Bond.

(Corporate Seal)

Surety

Company: _____

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

PERFORMANCE BOND
FOR PROCUREMENT CONTRACTS

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

SELLER (Name and Address):

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

BUYER (Name and Address):

CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Contract Date):

Bond Number:

Amount:

Modifications to this Bond Form:

Surety and Seller, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

Seller as Principal

Company: (Corp. Seal)

Signature:

Name and Title:

Surety

Company: (Corp. Seal)

Signature:

Name and Title:

(Attach Power of Attorney)

Address:

Telephone Number:

(Space is provided below for signatures of additional parties, if required.)

Seller as Principal

Company: (Corp. Seal)

Signature:

Name and Title:

Surety

Company: (Corp. Seal)

Signature:

Name and Title:

Address:

Telephone Number:

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

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

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

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

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

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

      a. Surety in accordance with the terms of the Contract;

      b. Another seller selected pursuant to Paragraph 4.3 to perform the Contract.

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

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

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

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

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

      a. determine the amount for which it may be liable to Buyer and, as soon as practicable after the amount is determined, tender payment therefor to Buyer; or

      b. deny liability in whole or in part and notify Buyer citing reasons therefor.

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

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

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

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

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

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

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

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

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location of the Point of Destination, and shall be instituted within two years after Seller Default or within two years after Seller ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

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

12. Definitions.

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

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

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

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

PAYMENT BOND
FOR PROCUREMENT CONTRACTS

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

SELLER (Name and Address):

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

BUYER (Name and Address):

CONTRACT
Date:
Amount:
Description (Name and Location):

BOND
Date (Not earlier than Contract Date):
Bond Number:
Amount:
Modifications to this Bond Form:

Surety and Seller, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

Seller as Principal
Company: (Corp. Seal)

Signature:
Name and Title:

Surety
Company: (Corp. Seal)

Signature:
Name and Title:
(Attach Power of Attorney)
Address:
Telephone Number:

(Space is provided below for signatures of additional parties, if required.)

Seller as Principal
Company: (Corp. Seal)

Signature:
Name and Title:

Surety
Company: (Corp. Seal)

Signature:
Name and Title:
Address:
Telephone Number:

1. Seller and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Buyer to pay for labor, materials and equipment furnished for use in the performance of the Contract, which is incorporated herein by reference. For purposes of this bond, Buyer means Buyer's assigns, if and when Buyer has assigned the Contract.
2. With respect to Buyer, this obligation shall be null and void if Seller:
   2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and
   2.2. Defends, indemnifies and holds harmless Buyer from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract, provided Buyer has promptly notified Seller and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to Seller and Surety, and provided there is no Buyer Default.
3. With respect to Claimants, this obligation shall be null and void if Seller promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
   4.1. Claimants who are employed by or have a direct contract with Seller have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Buyer stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
   4.2. Claimants who do not have a direct contract with Seller:
      a. Have furnished written notice to Seller and sent a copy, or notice thereof, to Buyer, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
      b. Have either received a rejection in whole or in part from Seller or not received within 30 days of furnishing the above notice any communication from Seller by which Seller had indicated the claim will be paid directly or indirectly; and
      c. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Buyer stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Seller.
5. If a notice required by Paragraph 4 is given by Buyer to Seller or to Surety, that is sufficient compliance.
6. Reserved.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Buyer to Seller under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By Seller furnishing and Buyer accepting this Bond, they agree that all funds earned by Seller in the performance of the Contract are dedicated to satisfy obligations of Seller and Surety under this Bond, subject to Buyer's priority to use the funds for the completion of the furnishing the Goods and Special Services.

9. Surety shall not be liable to Buyer, Claimants or others for obligations of Seller that are unrelated to the Contract. Buyer shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

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

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Goods relevant to the claim are located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or paragraph 4.2.3, 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 Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Buyer or Seller shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Buyer or Seller, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

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

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Seller shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

    15.1 *Claimant:* An individual or entity having a direct contract with Seller or with a Subcontractor of Seller to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for furnishing the Goods and Special Services by Seller and 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.

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

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

CONDITIONS OF THE CONTRACT

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

STANDARD GENERAL CONDITIONS FOR PROCUREMENT CONTRACTS

Prepared by

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and

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These Standard General Conditions for Procurement Contracts have been prepared for use with the Suggested Instructions to Bidders for Procurement Contracts (EJCDC P-200, 2010 Edition), the Agreement Between Buyer and Seller for Procurement Contracts (EJCDC P-520, 2010 Edition), and the Guide to Preparation of Supplementary Conditions for Procurement Contracts (EJCDC P-800, 2010 Edition). Their provisions are interrelated and a change in one may necessitate a change in the others. Additional information concerning the use of the EJCDC Procurement Documents may be found in the Commentary on Procurement Documents (EJCDC P-001, 2010 Edition).

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STANDARD GENERAL CONDITIONS FOR PROCUREMENT CONTRACTS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Whenever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to the singular or plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
2. *Agreement*—The written instrument signed by both Buyer and Seller covering the Goods and Special Services and which lists the Contract Documents in existence on the Effective Date of the Agreement.
3. *Application for Payment*—The form acceptable to Buyer which is used by Seller in requesting progress and final payments and which is accompanied by such supporting documentation as is required by the Contract Documents.
4. *Bid*— The offer or proposal of a Seller submitted on the prescribed form setting forth the prices for the Goods and Special Services to be provided.
5. *Bidder*—The individual or entity that submits a Bid directly to Buyer.
6. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and Bid Form with any supplements.
8. *Buyer*—The individual or entity purchasing the Goods and Special Services.
9. *Change Order*—A document which is signed by Seller and Buyer and authorizes an addition, deletion, or revision to the Contract Documents or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement. Change Orders may be the result of mutual agreement by Buyer and Seller, or of resolution of a Claim.
10. *Claim*—A demand or assertion by Buyer or Seller seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
11. *Contract*—The entire and integrated written agreement between Buyer and Seller concerning the Goods and Special Services. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Shop Drawings and other Seller submittals are not Contract Documents, even if accepted, reviewed, or approved by Engineer or Buyer.

13. *Contract Price*—The moneys payable by Buyer to Seller for furnishing the Goods and Special Services in accordance with the Contract Documents as stated in the Agreement.

14. *Contract Times*—The times stated in the Agreement by which the Goods must be delivered and Special Services must be furnished.

15. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Goods and Special Services to be furnished by Seller. Shop Drawings and other Seller submittals are not Drawings as so defined.

16. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

17. *Engineer*—The individual or entity designated as such in the Agreement.

18. *Field Order*—A written order issued by Engineer which requires minor changes in the Goods or Special Services but which does not involve a change in the Contract Price or Contract Times.

19. *General Requirements*—Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

20. *Goods*—The tangible and movable personal property that is described in the Contract Documents, regardless of whether the property is to be later attached to realty.

21. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, including Goods, as defined herein, and Special Services, if any, as defined herein. This term refers to both the Goods and the Special Services, or to either the Goods or the Special Services, and to any portion of the Goods or the Special Services, as the context requires.

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

23. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to the Contract Times.

24. *Notice of Award*—The written notice by Buyer to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Buyer will sign and deliver the Agreement.

25. *Notice to Proceed*—A written notice given by Buyer to Seller fixing the date on which the Contract Times commence to run and on which Seller shall start to perform under the Contract.

26. *Point of Destination*—The specific address of the location where delivery of the Goods shall be made, as stated in the Agreement.

27. *Project*—The total undertaking of which the Goods and Special Services may be the whole, or only a part.

28. *Project Manual*—The documentary information prepared for bidding and furnishing the Goods and Special Services. A listing of the contents of the Project Manual is contained in its table of contents.

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

30. *Seller*—The individual or entity furnishing the Goods and Special Services.

31. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Seller and submitted by Seller to illustrate some portion of the Goods and Special Services.

32. *Special Services*—Services associated with the Goods to be furnished by Seller as required by the Contract Documents.

33. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the furnishing of the Goods and Special Services, and certain administrative requirements and procedural matters applicable thereto.

34. *Successful Bidder*—The Bidder submitting a responsive Bid, to whom Buyer makes an award.

35. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

36. *Work Change Directive*—A written statement to Seller issued on or after the Effective Date of the Agreement and signed by Buyer ordering an addition, deletion, or other revision in the Contract Documents with respect to the Goods and Special Services. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

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

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Goods and Special Services. It is intended that such exercise of professional judgment, action, or determination will be commercially reasonable and will be solely to evaluate, in general, the Goods and Special Services for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to Engineer any duty or authority to supervise or direct

the furnishing of Goods or Special Services or any duty or authority to undertake responsibility contrary to any other provision of the Contract Documents.

2. The word "non-conforming" when modifying the words "Goods and Special Services," "Goods," or "Special Services," refers to Goods and Special Services that fail to conform to the Contract Documents.

3. The word "receipt" when referring to the Goods, shall mean the physical taking and possession by the Buyer under the conditions specified in Paragraph 8.01.B.3.

4. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

5. The word "furnish," when used in connection with the Goods and Special Services shall mean to supply and deliver said Goods to the Point of Destination (or some other specified location) and to perform said Special Services fully, all in accordance with the Contract Documents.

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds*

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

2.02 *Evidence of Insurance*

A. When Seller delivers the executed counterparts of the Agreement to Buyer, Seller shall deliver to Buyer, with copies to each additional insured identified by name in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Seller is required to purchase and maintain in accordance with Article 4.

2.03 *Copies of Documents*

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

2.04 *Commencement of Contract Times; Notice to Proceed*

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

2.05 *Designated Representatives*

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

2.06 *Progress Schedule*

A. Within 15 days after the Contract Times start to run, Seller shall submit to Buyer and Engineer an acceptable progress schedule of activities, including at a minimum, Shop Drawing and Sample submittals,

tests, and deliveries as required by the Contract Documents. No progress payment will be made to Seller until an acceptable schedule is submitted to Buyer and Engineer.

B. The progress schedule will be acceptable to Buyer and Engineer if it provides an orderly progression of the submittals, tests, and deliveries to completion within the specified Milestones and the Contract Times. Such acceptance will not impose on Buyer or Engineer responsibility for the progress schedule, for sequencing, scheduling, or progress of the work nor interfere with or relieve Seller from Seller's full responsibility therefor. Such acceptance shall not be deemed to acknowledge the reasonableness and attainability of the schedule.

2.07 *Preliminary Conference*

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

2.08 *Safety*

A. Buyer and Seller shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss. When Seller's personnel, or the personnel of any subcontractor to Seller, are present at the Point of Destination or any work area or site controlled by Buyer, the Seller shall be responsible for the compliance by such personnel with any applicable requirements of Buyer's safety programs that are made known to Seller.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT AND AMENDING

3.01 *Intent*

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

B. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce or furnish the indicated Goods and Special Services will be provided, whether or not specifically called for, at no additional cost to Buyer.

C. Clarifications and interpretations of, or notifications of minor variations and deviations in, the Contract Documents, will be issued by Engineer as provided in Article 9.

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

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

B. No provision of any such standard, specification, manual or code, or any instruction of a supplier shall be effective to change the duties or responsibilities of Buyer or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to Buyer or Engineer, or any of their consultants, agents, or employees any duty or authority to supervise or direct the performance of Seller's obligations or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

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

2. *Seller's Review of Contract Documents During the Performance of the Contract:* If, during the performance of the Contract, Seller discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Contract, any standard, specification, manual or code, or of any instruction of any Supplier, Seller shall promptly report it to Engineer in writing. Seller shall not proceed with the furnishing of the Goods and Special Services affected thereby until an amendment to or clarification of the Contract Documents has been issued.

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

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

1. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

2. the provisions of any Laws or Regulations applicable to the furnishing of the Goods and Special Services (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Clarifying Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions to the Goods and Special Services or to modify contractual terms and conditions by a Change Order.

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

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

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 5.06.D.3); or

3. Engineer's written interpretation or clarification.

ARTICLE 4 – BONDS AND INSURANCE

4.01 *Bonds*

A. Seller shall furnish to Buyer performance and payment bonds, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Seller's obligations under the Contract Documents. These bonds shall remain in effect until 1) one year after the date when final payment becomes due or 2) completion of the correction period specified in Paragraph 8.03, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Seller shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

C. If the surety on any bond furnished by Seller is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 4.01.B, Seller shall promptly notify Buyer and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 4.01.B and 4.02.

4.02 *Insurance*

A. Seller shall provide insurance of the types and coverages and in the amounts stipulated in the Supplementary Conditions.

B. Failure of Buyer to demand certificates of insurance or other evidence of Seller's full compliance with these insurance requirements or failure of Buyer to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Seller's obligation to maintain such insurance.

C. Upon assignment of this Contract, Seller shall comply with the written request of assignee to provide certificates of insurance to assignee.

D. Buyer does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Seller.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Seller's liability under the indemnities granted to Buyer in the Contract Documents.

4.03 *Licensed Sureties and Insurers*

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

ARTICLE 5 – SELLER'S RESPONSIBILITIES

5.01 *Supervision and Superintendence*

A. Seller shall supervise, inspect, and direct the furnishing of the Goods and Special Services competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform its obligations in accordance with the Contract Documents. Seller shall be solely responsible for the means, methods, techniques, sequences, and procedures necessary to perform its obligations in accordance with the Contract Documents. Seller shall not be responsible for the negligence of Buyer or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure that is shown or indicated in and expressly required by the Contract Documents.

5.02 *Labor, Materials and Equipment*

A. Seller shall provide competent, qualified and trained personnel in all aspects of its performance of the Contract.

B. All Goods, and all equipment and material incorporated into the Goods, shall be as specified, and unless specified otherwise in the Contract Documents, shall be:

1. new, and of good quality;
2. protected, assembled, connected, cleaned, and conditioned in accordance with the original manufacturer's instructions; and
3. shop assembled to the greatest extent practicable.

5.03 *Laws and Regulations*

A. Seller shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of its obligations in accordance with the Contract Documents. Except where otherwise expressly required by such Laws and Regulations, neither Buyer nor Engineer shall be responsible for monitoring Seller's compliance with any Laws or Regulations.

B. If Seller furnishes Goods and Special Services knowing or having reason to know that such furnishing is contrary to Laws or Regulations, Seller shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such performance. It shall not be Seller's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this provision shall not relieve Seller of Seller's obligations under Paragraph 3.03.

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

5.04 *Or Equals*

A. Whenever the Goods, or an item of material or equipment to be incorporated into the Goods, are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier or manufacturer, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item is permitted, other items of material or

equipment or material or equipment of other suppliers or manufacturers may be submitted to Buyer for Engineer's review.

1. If in Engineer's sole discretion, such an item of material or equipment proposed by Seller is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by Engineer as an "or-equal" item.
2. For the purposes of this paragraph, a proposed item of material or equipment may be considered functionally equal to an item so named only if:
   a. in the exercise of reasonable judgment, Engineer determines that: 1) it is at least equal in quality, durability, appearance, strength, and design characteristics; 2) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; 3) it has an acceptable record of performance and availability of responsive service; and
   b. Seller certifies that if approved: 1) there will be no increase in any cost, including capital, installation or operating costs, to Buyer; and 2) the proposed item will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraph 5.04.A. Engineer will be the sole judge of whether to accept or reject such a proposal or submittal. No "or-equal" will be ordered, manufactured or utilized until Engineer's review is complete, which will be evidenced by an approved Shop Drawing. Engineer will advise Buyer and Seller in writing of any negative determination. Notwithstanding Engineer's approval of an "or-equal" item, Seller shall remain obligated to comply with the requirements of the Contract Documents.

C. *Special Guarantee:* Buyer may require Seller to furnish at Seller's expense a special performance guarantee or other surety with respect to any such proposed "or-equal."

D. *Data:* Seller shall provide all data in support of any such proposed "or-equal" at Seller's expense.

5.05 *Taxes*

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

5.06 *Shop Drawings and Samples*

A. Seller shall submit Shop Drawings and Samples to Buyer for Engineer's review and approval in accordance with the schedule required in Paragraph 2.06.A. All submittals will be identified as required and furnished in the number of copies specified in the Contract Documents. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Seller proposes to provide.

B. Where a Shop Drawing or Sample is required by the Contract Documents, any related work performed prior to Engineer's approval of the pertinent submittal will be at the sole expense and responsibility of Seller.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Seller shall have determined and verified:

a. all field measurements (if required), quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto; and

b. that all materials are suitable with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the furnishing of Goods and Special Services.

2. Seller shall also have reviewed and coordinated each Shop Drawing or Sample with the Contract Documents.

3. Each submittal shall bear a stamp or include a written certification from Seller that Seller has reviewed the subject submittal and confirmed that it is in compliance with the requirements of the Contract Documents. Both Buyer and Engineer shall be entitled to rely on such certification from Seller.

4. With each submittal, Seller shall give Buyer and Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both in a written communication separate from the submittal and by specific notation on each Shop Drawing or Sample.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples.

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

3. Engineer's review and approval shall not relieve Seller from responsibility for any variation from the requirements of the Contract Documents unless Seller has complied with the requirements of Paragraph 5.06.C.4 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Seller from responsibility for complying with the requirements of Paragraph 5.06.C.1.

E. *Resubmittal Procedures:*

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

5.07 *Continuing Performance*

A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06.A., and the Goods shall be delivered and the Special Services furnished within the Contract Times specified in the Agreement.

B. Seller shall carry on furnishing of the Goods and Special Services and adhere to the progress schedule during all disputes or disagreements with Buyer. No furnishing of Goods and Special Services shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraphs 11.03 or 11.04, or as Buyer and Seller may otherwise agree in writing.

5.08 *Seller's Warranties and Guarantees*

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

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

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

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

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

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

E. Buyer shall promptly notify Seller of any breach of Seller's warranties or guarantees.

F. Seller makes no implied warranties under this Contract.

5.09 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Seller shall indemnify and hold harmless Buyer and Engineer, and the officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the

performance of Seller's obligations under the Contract Documents, provided that any such claim, cost, loss, or damages attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Goods themselves), including the loss of use resulting therefrom, but only to the extent cause by any negligent act or omission of Seller, or any individual or entity directly or indirectly employed by Seller or anyone for whose acts Seller may be liable.

B. In any and all claims against Buyer or Engineer or any of their respective assignees, consultants, agents, officers, directors, members, partners, employees, agents, consultants, contractors, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Seller, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to furnish any of the Goods and Special Services, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 5.09.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for seller or any such subcontractor, supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Seller under Paragraph 5.09.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, and consultants arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

5.10 *Delegation of Professional Design Services*

A. Seller will not be required to provide professional design services unless such services are specifically required by the Contract Documents or unless such services are required to carry out Seller's responsibilities for furnishing the Goods and Special Services. Seller shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to the Goods and Special Services are specifically required of Seller by the Contract Documents, Buyer and Engineer will specify all performance and design criteria that such services must satisfy. Seller shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Goods and Special Services designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Buyer and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Buyer and Engineer have specified to Seller all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 5.10, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 5.06.D.2.

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

ARTICLE 6 – SHIPPING AND DELIVERY

6.01 *Shipping*

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

6.02 *Delivery*

A. Seller shall deliver the Goods F.O.B. the Point of Destination in accordance with the Contract Times set forth in the Agreement, or other date agreed to by Buyer and Seller.

B. Seller shall provide written notice to Buyer at least 10 days before shipment of the manner of shipment and the anticipated delivery date. The notice shall also include any instructions concerning special equipment or services required at the Point of Destination to unload and care for the Goods. Seller shall also require the carrier to give Buyer at least 24 hours' notice by telephone prior to the anticipated time of delivery.

C. Buyer will be responsible and bear all costs for unloading the Goods from carrier.

D. Buyer will assure that adequate facilities are available to receive delivery of the Goods during the Contract Times for delivery set forth in the Agreement, or another date agreed by Buyer and Seller.

E. No partial deliveries shall be allowed, unless permitted or required by the Contract Documents or agreed to in writing by Buyer.

6.03 *Risk of Loss*

A. Risk of loss and insurable interests transfer from Seller to Buyer upon Buyer's receipt of the Goods.

B. Notwithstanding the provisions of Paragraph 6.03.A, if Buyer rejects the Goods as non-conforming, the risk of loss on such Goods shall remain with Seller until Seller corrects the non-conformity or Buyer accepts the Goods. If rejected Goods remain at the Point of Destination pending modification and acceptance, then Seller shall be responsible for arranging adequate protection and maintenance of the Goods at Seller's expense.

6.04 *Progress Schedule*

A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06 as it may be adjusted from time to time as provided below.

1. Seller shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.06) proposed adjustments in the progress schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 7. Adjustments in Contract Times may only be made by a Change Order.

ARTICLE 7 – CHANGES: SCHEDULE AND DELAY

7.01 *Changes in the Goods and Special Services*

A. Buyer may at any time, without notice to any surety, make an addition, deletion, or other revision to the Contract Documents with respect to the Goods and Services, within the general scope of the Contract, by a Change Order or Work Change Directive. Upon receipt of any such document, Seller shall promptly proceed with performance pursuant to the revised Contract Documents (except as otherwise specifically provided).

B. If Seller concludes that a Work Change Directive issued by Buyer affects the Contract Price or Contract Times, then Seller shall notify Buyer within 15 days after Seller has received the Work Change Directive, and submit written supporting data to Buyer within 45 days after such receipt. If Seller fails to notify Buyer within 15 days, Seller waives any Claim for such adjustment. If Buyer and Seller are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 9.06.

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

7.02 *Changing Contract Price or Contract Times*

A. The Contract Price or Contract Times may only be changed by a Change Order.

B. Any Claim for an adjustment in the Contract Price or Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 9.06.

C. If Seller is prevented from delivering the Goods or performing the Special Services within the Contract Times for any unforeseen reason beyond its control and not attributable to its actions or inactions, then Seller shall be entitled to an adjustment of the Contract Times to the extent attributable to such reason. Such reasons include but are not limited to acts or neglect by Buyer, inspection delays, fires, floods, epidemics, abnormal weather conditions, acts of God, and other like matters. If such an event occurs and delays Seller's performance, Seller shall notify Buyer in writing within 15 days of knowing or having reason to know of the beginning of the event causing the delay, stating the reason therefor.

D. Seller shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Seller. Delays attributable to and within the control of Seller's subcontractors or suppliers shall be deemed to be delays within the control of Seller.

E. If Seller is prevented from delivering the Goods or furnishing the Special Services within the Contract Times due to the actions or inactions of Buyer, Seller shall be entitled to any reasonable and necessary additional costs arising out of such delay to the extent directly attributable to Buyer.

F. Neither Buyer nor Seller shall be entitled to any damages arising from delays which are beyond the control of both Buyer and Seller, including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, and other like matters.

ARTICLE 8 – BUYER'S RIGHTS

8.01 *Inspections and Testing*

A. *General:*

1. The Contract Documents specify required inspections and tests. Buyer shall have the right to perform, or cause to be performed, reasonable inspections and require reasonable tests of the Goods at Seller's facility, and at the Point of Destination. Seller shall allow Buyer a reasonable time to perform such inspections or tests.

2. Seller shall reimburse Buyer for all expenses, except for travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, for inspections and tests specified in the Contract Documents. If as the result of any such specified testing the Goods are determined to be non-conforming, then Seller shall also bear the travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, and all expenses of re-inspection or retesting.

3. Buyer shall bear all expenses of inspections and tests that are not specified in the Contract Documents (other than any re-inspection or retesting resulting from a determination of non-conformity, as set forth in Paragraph 8.01.A.2 immediately above); provided, however, that if as the result of any such non-specified inspections or testing the Goods are determined to be non-conforming, then Seller shall bear all expenses of such inspections and testing, and of any necessary re-inspection and retesting.

4. Seller shall provide Buyer timely written notice of the readiness of the Goods for all inspections, tests, or approvals which the Contract Documents specify are to be observed by Buyer prior to shipment.

5. Buyer will give Seller timely notice of all specified tests, inspections, and approvals of the Goods which are to be conducted at the Point of Destination.

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

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

B. Inspection on Delivery:

1. Buyer or Engineer will visually inspect the Goods upon delivery solely for purposes of identifying the Goods and general verification of quantities and observation of apparent condition in order to provide a basis for a progress payment. Such visual inspection will not be construed as final or as receipt of any Goods and Special Services that, as a result of subsequent inspections and tests, are determined to be non-conforming.

2. Within ten days of such visual inspection, Buyer shall provide Seller with written notice of Buyer's determination regarding conformity of the Goods. In the event Buyer does not provide such notice, it will be presumed that the Goods appear to be conforming and that Buyer has acknowledged their receipt upon delivery.

3. If, on the basis of the visual inspection specified in Paragraph 8.01.B.1, the Goods appear to be conforming, Buyer's notice thereof to Seller will acknowledge receipt of the Goods.

C. Final Inspection:

1. After all of the Goods have been incorporated into the Project, tested in accordance with such testing requirements as are specified, and are functioning as indicated, Buyer or Engineer will make a final inspection.

2. If, on the basis of the final inspection, the Goods are conforming, Buyer's notice thereof will constitute Buyer's acceptance of the Goods.

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

8.02 *Non-Conforming Goods and Special Services*

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

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

1. If Buyer elects to reject the Goods in whole or in part, Buyer's notice to Seller will describe in sufficient detail the non-conforming aspect of the Goods. If Goods have been delivered to Buyer, Seller shall promptly, and within the Contract Times, remove and replace the rejected Goods.

2. Seller shall bear all costs, losses and damages attributable to the removal and replacement of the non-conforming Goods as provided in Paragraph 8.02.E.

3. Upon rejection of the Goods, Buyer retains a security interest in the Goods to the extent of any payments made and expenses incurred in their testing and inspection.

C. Remedying Non-Conforming Goods and Special Services:

1. If Buyer elects to permit the Seller to modify the Goods to correct the non-comformance, then Seller shall promptly provide a schedule for such modifications and shall make the Goods conforming within a reasonable time.

2. If Buyer notifies Seller in writing that any of the Special Services are non-conforming, Seller shall promptly provide conforming services acceptable to Buyer. If Seller fails to do so, Buyer may delete the Special Services and reduce the Contract Price a commensurate amount.

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

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

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

correction or removal and replacement of the non-conforming Goods, and obtaining conforming Special Services from others.

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

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

8.03 *Correction Period*

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

ARTICLE 9 – ROLE OF ENGINEER

9.01 *Duties and Responsibilities*

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

9.02 *Clarifications and Interpretations*

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

9.03 *Authorized Variations*

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

9.04 *Rejecting Non-Conforming Goods and Special Services*

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

9.05 *Decisions on Requirements of Contract Documents*

A. Engineer will be the initial interpreter of the Contract Documents and judge of the acceptability of the Goods and Special Services. Claims, disputes and other matters relating to the acceptability of the Goods and Special Services or the interpretation of the requirements of the Contract Documents pertaining to

Seller's performance will be referred initially to Engineer in writing with a request for a formal decision in accordance with this paragraph.

B. When functioning as interpreter and judge under this Paragraph 9.05, Engineer will not show partiality to Buyer or Seller and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by Engineer pursuant to this Paragraph 9.05 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 10.07) will be a condition precedent to any exercise by Buyer or Seller of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.06 ***Claims and Disputes***

A. *Notice*: Written notice of each Claim relating to the acceptability of the Goods and Special Services or the interpretation of the requirements of the Contract Documents pertaining to either party's performance shall be delivered by the claimant to Engineer and the other party to the Agreement within 15 days after the occurrence of the event giving rise thereto, and written supporting data shall be submitted to Engineer and the other party within 45 days after such occurrence unless Engineer allows an additional period of time to ascertain more accurate data.

B. *Engineer's Decision*: Engineer will review each such Claim and render a decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

C. If Engineer does not render a formal written decision on a Claim within the time stated in Paragraph 9.06.B., Engineer shall be deemed to have issued a decision denying the Claim in its entirety 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. Engineer's written decision on such Claim or a decision denying the Claim in its entirety that is deemed to have been issued pursuant to Paragraph 9.06.C, will be final and binding upon Buyer and Seller 30 days after it is issued unless within 30 days of issuance Buyer or Seller appeals Engineer's decision by initiating the mediation of such Claim in accordance with the dispute resolution procedures set forth in Article 13.

E. If Article 13 has been amended to delete the mediation requirement, then Buyer or Seller may appeal Engineer's decision within 30 days of issuance by following the alternative dispute resolution process set forth in Article 13, as amended; or if no such alternative dispute resolution process has been set forth, Buyer or Seller may appeal Engineer's decision by 1) delivering to the other party within 30 days of the date of such decision a written notice of intent to submit the Claim to a court of competent jurisdiction, and 2) within 60 days after the date of such decision instituting a formal proceeding in a court of competent jurisdiction.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 9.06.

G. The parties agree to endeavor to avoid or resolve Claims through direct, good faith discussions and negotiations whenever practicable. Such discussions and negotiations should at the outset address whether the parties mutually agree to suspend the time periods established in this Paragraph 9.06; if so, a written record of such mutual agreement should be made and jointly executed.

ARTICLE 10 – PAYMENT

10.01 *Applications for Progress Payments*

A. Seller shall submit to Buyer for Engineer's review Applications for Payment filled out and signed by Seller and accompanied by such supporting documentation as is required by the Contract Documents and also

as Buyer or Engineer may reasonably require. The timing and amounts of progress payments shall be as stipulated in the Agreement.

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

10.02 *Review of Applications for Progress Payments*

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

1. Engineer's recommendation of payment requested in the first Application for Payment will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data, that the Shop Drawings and Samples have been reviewed and approved as required by the Contract Documents and Seller is entitled to payment of the amount recommended.
2. Engineer's recommendation of payment requested in the Application for Payment submitted upon Buyer's acknowledgment of receipt of the Goods will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data Seller is entitled to payment of the amount recommended. Such recommendation will not constitute a representation that Engineer has made a final inspection of the Goods, that the Goods are free from non-conformities, acceptable or in conformance with the Contract Documents, that Engineer has made any investigation as to Buyer's title to the Goods, that exhaustive or continuous inspections have been made to check the quality or the quantity of the Goods beyond the responsibilities specifically assigned to Engineer in the Contract Documents or that there may not be other matters or issues between the parties that might entitle Seller to additional payments by Buyer or Buyer to withhold payment to Seller.
3. Engineer may refuse to recommend that all or any part of a progress payment be made, or Engineer may nullify all or any part of any payment previously recommended if, in Engineer's opinion, such recommendation would be incorrect or if on the basis of subsequently discovered evidence or subsequent inspections or tests Engineer considers such refusal or nullification necessary to protect Buyer from loss because the Contract Price has been reduced, Goods are found to be non-conforming, or Seller has failed to furnish acceptable Special Services.

10.03 *Amount and Timing of Progress Payments*

A. Subject to Paragraph 10.02.A., the amounts of the progress payments will be as provided in the Agreement. Buyer shall within 30 days after receipt of each Application for Payment with Engineer's recommendation pay Seller the amount recommended; but, in the case of the Application for Payment

upon Buyer's acknowledgment of receipt of the Goods, said 30-day period may be extended for so long as is necessary (but in no event more than 60 days) for Buyer to examine the bill of sale and other documentation submitted therewith. Buyer shall notify Seller promptly of any deficiency in the documentation and shall not unreasonably withhold payment.

10.04 *Suspension of or Reduction in Payment*

A. Buyer may suspend or reduce the amount of progress payments, even though recommended for payment by Engineer, under the following circumstances:

1. Buyer has reasonable grounds to conclude that Seller will not furnish the Goods or the Special Services in accordance with the Contract Documents, and

2. Buyer has requested in writing assurances from Seller that the Goods and Special Services will be delivered or furnished in accordance with the Contract Documents, and Seller has failed to provide adequate assurances within ten days of Buyer's written request.

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

10.05 *Final Application for Payment*

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

10.06 *Final Payment*

A. If, on the basis of final inspection and the review of the final Application for Payment and accompanying documentation, Engineer is reasonably satisfied that Seller has furnished the Goods and Special Services in accordance with the Contract Documents, and that Seller's has fulfilled all other obligations under the Contract Documents, then Engineer will, within ten days after receipt of the final Application for Payment, recommend in writing final payment subject to the provisions of Paragraph 10.07 and present the Application to Buyer. Otherwise, Engineer will return the Application to Seller, indicating the reasons for refusing to recommend final payment, in which case Seller shall make the necessary corrections and resubmit the Application for payment. If the Application and accompanying documentation are appropriate as to form and substance, Buyer shall, within 30 days after receipt thereof, pay Seller the amount recommended by Engineer, less any sum Buyer is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages to which Buyer is entitled.

10.07 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Buyer against Seller, except Claims arising from unsettled liens from non-conformities in the Goods or Special Services appearing after final payment, from Seller's failure

to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Seller's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Seller against Buyer (other than those previously made in accordance with the requirements herein and listed by Seller as unsettled as required in Paragraph 10.05.A, and not resolved in writing).

ARTICLE 11 – CANCELLATION, SUSPENSION, AND TERMINATION

11.01 *Cancellation*

A. Buyer has the right to cancel the Contract, without cause, at any time prior to delivery of the Goods by written notice. Cancellation pursuant to the terms of this paragraph shall not constitute a breach of contract by Buyer. Upon cancellation:

1. Buyer shall pay Seller for the direct costs incurred in producing any Goods that Seller has specially manufactured for the Project, plus a fair and reasonable amount for overhead and profit.

2. For Goods that are not specially manufactured for the Project, Seller shall be entitled to a restocking charge of 10 percent of the unpaid Contract Price of such Goods.

11.02 *Suspension of Performance by Buyer*

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

11.03 *Suspension of Performance by Seller*

A. Subject to the provisions of Paragraph 5.07.B, Seller may suspend the furnishing of the Goods and Special Services only under the following circumstance:

1. Seller has reasonable grounds to conclude that Buyer will not perform its future payment obligations under the Contract; and,

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

11.04 *Breach and Termination*

A. Buyer's Breach:

1. Buyer shall be deemed in breach of the Contract if it fails to comply with any material provision of the Contract Documents, including but not limited to:

a. wrongful rejection or revocation of Buyer's acceptance of the Goods,

b. failure to make payments in accordance with the Contract Documents, or

c. wrongful repudiation of the Contract.

2. Seller shall have the right to terminate the Contract for cause by declaring a breach should Buyer fail to comply with any material provisions of the Contract. Upon termination, Seller shall be entitled to all remedies provided by Laws and Regulations.

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

B. Seller's Breach:

1. Seller shall be deemed in breach of the Contract if it fails to comply with any material provision of the Contract Documents, including, but not limited to:

a. failure to deliver the Goods or perform the Special Services in accordance with the Contract Documents,

b. wrongful repudiation of the Contract, or

c. delivery or furnishing of non-conforming Goods and Special Services.

2. Buyer may terminate Seller's right to perform the Contract for cause by declaring a breach should Seller fail to comply with any material provision of the Contract Documents. Upon termination, Buyer shall be entitled to all remedies provided by Laws and Regulations.

a. In the event Buyer believes Seller is in breach of its obligations under the Contract, and except as provided in Paragraph 11.04.B.2.b, Buyer shall provide Seller with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Seller shall have seven days from receipt of the written notice declaring the breach (or such longer period of time as Buyer may grant in writing) within which to cure or to proceed diligently to cure such alleged breach.

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

ARTICLE 12 – LICENSES AND FEES

12.01 *Intellectual Property and License Fees*

A. Unless specifically stated elsewhere in the Contract Documents, Seller is not transferring any intellectual property rights, patent rights, or licenses for the Goods delivered. However, in the event the Seller is manufacturing to Buyer's design, Buyer retains all intellectual property rights in such design.

B. Seller shall pay all license fees and royalties and assume all costs incident to the use or the furnishing of the Goods, unless specified otherwise by the Contract Documents.

12.02 *Seller's Infringement*

A. Subject to Paragraph 12.01.A, Seller shall indemnify and hold harmless Buyer, Engineer and their officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement or alleged infringement of any United States or foreign patent or copyright by any of the Goods as delivered hereunder.

B. In the event of suit or threat of suit for intellectual property infringement, Buyer will promptly notify Seller of receiving notice thereof.

C. Seller shall promptly defend the claim or suit, including negotiating a settlement. Seller shall have control over such claim or suit, provided that Seller agrees to bear all expenses and to satisfy any adverse judgment thereof.

1. If Seller fails to defend such suit or claim after written notice by Buyer, Seller will be bound in any subsequent suit or claim against Seller by Buyer by any factual determination in the prior suit or claim.

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

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

12.03 *Buyer's Infringement*

A. Buyer shall indemnify and hold harmless Seller, and its officers, directors, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement or alleged infringement of any United States or foreign patent or copyright caused by Seller's compliance with Buyer's design of the Goods or Buyer's use of the Goods in combination with other materials or equipment in any process (unless intent of such use was known to Seller and Seller had reason to know such infringement would result).

B. In the event of suit or threat of suit for intellectual property infringement, Seller must after receiving notice thereof promptly notify Buyer.

C. Upon written notice from Seller, Buyer shall be given the opportunity to defend the claim or suit, including negotiating a settlement. Buyer shall have control over such claim or suit, provided that Buyer agrees to bear all expenses and to satisfy any adverse judgment thereof.

1. If Buyer fails to defend such suit or claim after written notice by Seller, Buyer will be bound in any subsequent suit or claim against Buyer by Seller by any factual determination in the prior suit or claim.

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

12.04 *Reuse of Documents*

A. Neither Seller nor any other person furnishing any of the Goods and Special Services under a direct or indirect contract with Seller shall: (1) acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions; or (2) reuse any of such Drawings, Specifications, other documents, or copies thereof on any other project without written consent of Buyer and Engineer and specific written verification or adaptation by Engineer. This prohibition will survive termination or completion of the Contract. Nothing herein shall preclude Seller from retaining copies of the Contract Documents for record purposes.

12.05 *Electronic Data*

A. Unless otherwise stated in the Supplementary Conditions, copies of data furnished by Buyer or Engineer to Seller, or by Seller to Buyer or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. The transferring party will correct any errors detected within the 60-day acceptance period.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 13 – DISPUTE RESOLUTION

13.01 *Dispute Resolution Method*

A. Either Buyer or Seller may initiate the mediation of any Claim decided in writing by Engineer under Paragraph 9.06.B or 9.06.C before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the Engineer's decision from becoming final and binding.

B. Buyer and Seller shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the mediation process does not result in resolution of the Claim, then Engineer's written decision under Paragraph 9.06.B or a denial pursuant to Paragraph 9.06.C shall become final and binding 30 days after termination of the mediation unless, within that time period, Buyer or Seller:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or
2. agrees with the other party to submit the Claim to another dispute resolution process, or
3. if no dispute resolution process has been provided for in the Supplementary Conditions, delivers to the other party written notice of the intent to submit the Claim to a court of competent jurisdiction, and within 60 days of the termination of the mediation institutes such formal proceeding.

ARTICLE 14 – MISCELLANEOUS

14.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if: 1) delivered in person to the individual or to a member of the firm or to an

officer of the corporation for whom it is intended, or 2) if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

14.02 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Point of Destination is located.

B. In the case of any conflict between the express terms of this Contract and the Uniform Commercial Code, as adopted in the state whose law governs, it is the intent of the parties that the express terms of this Contract shall apply.

14.03 *Computation of Time*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day shall be omitted from the computation.

14.04 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

14.05 *Survival of Obligations*

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

14.06 *Entire Agreement*

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

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions for Procurement Contracts, EJCDC P-700 (2010 Edition), and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

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

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 Add the following terms and definitions to Article 1:

Engineer – The Engineer is further defined as Keller Associates Inc., 131 SW 5th Avenue, Meridian, ID 83642.

Buyer – The Buyer is further defined as the City of Emmett.

Owner – The terms Owner and Buyer may be used interchangeably in the Contract Documents to refer to the same party.

Vendor – The terms Seller and Vendor may be used interchangeably in the Contract Documents to refer to the same party.

Installation Contractor – The Installation Contractor is further defined as the contractor responsible for installation of the Goods furnished under this project.

Construction Contractor – The terms Construction Contractor and Installation Contractor may be used interchangeably in the Contract Documents to refer to the same party.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.03 Delete Part A and add the following in its place:

A. Engineer shall furnish Seller up to three hard copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

ARTICLE 4 – BONDS AND INSURANCE

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

F. Seller shall purchase and maintain such liability and other insurance as is appropriate for the furnishing of Goods and Special Services and as will provide protection from claims set forth below which may arise out of or result from Seller's furnishing of the Goods or Special Services and Seller's other obligations under the Contract Documents, whether the furnishing of Goods and Special Services or other

obligations are to be performed by Seller, any subcontractor or supplier, or by anyone directly or indirectly employed by any of them to furnish the Goods and Special Services, or by anyone for whose acts any of them may be liable:

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

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

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

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

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

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

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

1. with respect to insurance required by Paragraphs SC-4.02.F.3 through SC-4.02.F.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) City of Emmett and Keller Associates, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

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

3. include completed operations insurance;

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

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to Buyer and Seller and to each other additional

insured identified in these Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Seller pursuant to Paragraph SC-4.02.I will so provide);

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

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

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

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

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

a. State:	Statutory
b. Applicable Federal (e.g., Longshoreman's):	Statutory
c. Employer's Liability:	Statutory

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

a. General Aggregate	$2,000,000
b. Products - Completed	
1) Operations Aggregate	$2,000,000
c. Personal and Advertising	
1) Injury	$1,000,000
2) Each Occurrence (Bodily Injury and Property Damage)	$1,000,000

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

e. Excess or Umbrella Liability

1) General Aggregate $2,000,000

2) Each Occurrence $2,000,000

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

a. Bodily Injury:

1) Each person$1,000,000

2) Each Accident $1,000,000

b. Property Damage:

1) Each Accident $1,000,000

c. Combined Single Limit of $1,000,000

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

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

ARTICLE 5 – SELLER'S RESPONSIBILITIES

SC-5.04.A.2 Replace subparagraphs a) and b) with the following:

All requirements are satisfied as listed in Section 01 25 13 – Product Substitution Procedures.

SC-5.05.A Replace paragraph 5.05.A with the following:

A. The Installation Contractor installing the Owner-furnished equipment specified in these Contract Documents shall be responsible for all taxes and duties (if any) arising out of the sale of the Goods and furnishing of the special services provided by the Seller.

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.E:

F. Seller shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than two submittals.

Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, samples, or other items requiring approval and Seller shall reimburse Buyer for Engineer's charges for such time.

G. In the event the Seller requests a change of a previously approved item, Seller shall reimburse Buyer for Engineer's charges for its review time unless the need for such change is beyond the control of Seller.

SC-5.08.B Delete Paragraph 5.08.B in its entirety and insert the following in its place:

Seller warrants and guarantees to Buyer that all Goods and Special Services will conform with the Contract Documents, including any samples approved by Engineer, and the Goods will meet the Buyer's Technical Specifications. Engineer shall be entitled to rely on representation of Seller's warranty and guarantee.

SC-5.08 Add the following new paragraph immediately after Paragraph 5.08.F:

G. For warranties on Goods supplied by Seller to remain in effect, any replacement or addition of Goods to the system must be made using Goods approved in writing by Seller.

ARTICLE 6 – SHIPPING AND DELIVERY

SC-6.02.A Delete Paragraph 6.02.A in its entirety and insert the following in its place:

Seller shall deliver the Goods F.C.A. to the Point of Destination, or as otherwise specified in the Agreement for this contract, in accordance with the Contract Times set forth in the Agreement, or other date agreed to by Buyer and Seller.

SC-6.02.E Delete Paragraph 6.02.E in its entirety and insert the following in its place:

Partial deliveries and payment will be allowed. Seller shall be responsible for providing bill of sale or shipping receipt that allows Buyer to inventory each shipment.

SC-6.03.A Delete Paragraph 6.03.A in its entirety and insert the following in its place:

Risk of loss and insurable interests transfer from Seller to Buyer upon delivery of Goods to the Point of Destination.

ARTICLE 8 – BUYER'S RIGHTS

SC-8.02.B.2 Delete Paragraph 8.02.B.2 in its entirety and insert the following in its place:

Seller shall bear all costs for direct damages attributable to the removal and replacement of the non-conforming Goods as provided in paragraph 8.02.E.

SC-8.02.E Delete Paragraph 8.02.E in its entirety and insert the following in its place:

Seller shall pay all claims and costs for direct damages, including 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, or the obtaining of conforming Special Services from others.

SC-8.03.A Delete Paragraph 8.03.A in its entirety and insert the following in its place:

Seller's responsibility for correcting all non-conformities in Goods and Special Services will extend for a period of one year after the substantial completion date for the construction project. *Substantial completion* is defined as "the time at which the Work has progressed to the point where, in the opinion of Engineer, the Work is sufficiently complete, in accordance with the Contract Documents, so that the Work can be utilized for the purposes for which it is intended."

ARTICLE 10 – PAYMENT

SC-10.01. A Delete last sentence and insert: "Payment will be in accordance with Specification Section 01 30 10 – Schedule of Payments."

SC-10.01.A.1 Delete Paragraph 10.01.A.1 in its entirety.

SC-10.01.A.2 Delete Paragraph 10.01.A.2 in its entirety.

SC-10.02.A.1 Delete Paragraph 10.02.A.1 in its entirety.

SC-10.02.A.2 Delete Paragraph 10.02.A.2 in its entirety.

ARTICLE 12 – LICENSES AND FEES

SC-12.04 Add the following new paragraph immediately after Paragraph 12.04.A:

Buyer shall not reuse any Drawings, Specification, other documents, or copies thereof produced by Seller for this project on any other project without written consent of Seller. Nothing herein shall preclude Buyer or Engineer from retaining copies of the Contract Documents for record purposes. This prohibition will survive termination or completion of the Contract.

-END OF SECTION-

TECHNICAL SPECIFICATIONS

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK INCLUDED

A. It is required that there be furnished, in accordance with these Contract documents, influent fine screen equipment as set forth in these Technical Specifications.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Overview: The Work of this Contract comprises the supply and deliver of all materials (Influent Fine Screen and Control Panel) to the Emmett WWTP at 1478 Cascade Road in Emmett, Idaho. Technical assistance during installation, testing, startup, and operations training shall be provided as specified.

B. The Goods shall be delivered to the Emmett WWTP site.

C. The Vendor shall provide submittals to Owner and Engineer per Section 01 30 00 – Vendor Submittals.

D. The Vendor shall furnish operation, maintenance and technical manuals (Owner's manuals) pertaining to the equipment supplied in accordance with Section 01 78 23 - Operation and Maintenance Data.

E. **Work Not Included in this Contract**: Installation of the equipment to be furnished hereunder is not a part of this Contract.

1.3 CONTRACT METHOD

A. The Work hereunder will be constructed under a single lump sum.

1.4 DELIVERY

A. Vendor is responsible for equipment being adequately and effectively protected against damage from handling, or other cause, during transport from Vendor's premises to the place of delivery.

B. Delivery of equipment to be furnished under the Contract shall be completed at the Owner's job site, within the number of calendar days, after receipt by the Vendor of the Notice to Proceed, as specified in the Agreement. Delivery of all items shall be witnessed by the Owner and verified on the invoice by the Owner.

1.5 FACTORY REPRESENTATIVE

A. Vendor shall provide the services of a qualified factory representative as specified in Section 01 20 10 – Interface and Coordination Requirements and Section 01 20 20 – Vendor's Field Services. Such services shall include installation coordination, startup, operator training assistance and testing. Any services of the factory representative required because of deficiencies in materials and workmanship shall be borne by the Vendor.

1.6 EQUIPMENT FIELD TESTING

A. After installation, all mechanical systems shall be tested for proper operation, efficiency, and capacity by the Installation Contractor and the Vendor, in the presence of the Owner and Engineer. Vendor's factory representative shall perform any final adjustments and inspection during this test. All parts shall operate satisfactorily in all respects. If any part of a unit shows evidence of unsatisfactory or improper operation during the test period, correction or repairs shall be made by the Vendor and the full test operation shall be repeated. The Installation Contractor will furnish all personnel, water, fuel, oil, grease, and all other necessary materials for conducting the test operations.

B. All tests shall be performed during normal working hours.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 11 00

SECTION 01 20 10 – INTERFACE AND COORDINATION REQUIREMENTS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Equipment Vendors shall accommodate the overall design and construction schedule by submitting shop drawings of proposed equipment to Engineer as outlined in Section 00 41 13 – Bid Form. In addition, special services requiring the manufacturer's assistance will require interface with the Engineer and timely submittals to maintain design and construction schedule.

B. During the engineering and manufacturing of the Goods, the interface will be between each Vendor, the Engineer, and the Owner as stated in Section P-700 - General Conditions.

C. Before and during the installation and startup of the Goods, the Vendor shall be interfacing with both the Engineer and the Installation Contractor or Owner. It is understood that direct interface between the Vendor and Installation Contractor or Owner will be required. However, it is the Vendor's responsibility to keep the Engineer informed of all Information passing between itself and the Installation Contractor or Owner. Therefore, the Vendor shall send copies of all letters, drawings, telephone notes, etc. exchanged between itself and the Installation Contractor or Owner, to the Engineer.

D. Notice: Any notice, order, request or other communication shall be given in accordance with the provisions of Section P-700 - General Conditions. Any notice sent by first-class mail shall be deemed to have been given two days after the day of mailing.

E. Work by Owner and Others: The Vendor shall fully cooperate and coordinate its activity with the activities of the Owner, Installation Contractor, and other contractors so that work on the entire scheme of development may be performed with utmost speed consistent with good practice.

1.2 VENDOR SUBMITTALS

A. The Vendor shall submit a startup plan to Engineer in accordance with Section 01 30 00 - Vendor Submittals at least 60 days prior to scheduled startup date indicated by Installation Contractor or Owner. The startup plan shall include the following:

1. Equipment testing schedule.
2. Performance testing.
3. Instrumentation calibration and alarm review.
4. Programmable logic controller verification and testing.
5. Develop on-going approach to move equipment from startup to full operational status.

B. The start-up plan shall satisfy requirements listed in Section 01 75 16 – Startup Procedures.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 20 10

SECTION 01 20 20 – VENDOR'S FIELD SERVICES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Vendor shall furnish erection assistance as required for consultation at the job site during installation of all equipment. The Vendor shall also furnish qualified personnel for inspection testing and startup of the finished installation and training of operational personnel.

B. Each Vendor's representative for the equipment specified herein shall be present at the job site and/or classroom designated by the Owner for a minimum amount of workdays for service in the schedule listed below:

Schedule of Field Service Representative On Site Time		
Service	On Site Time	Trips to Site
Influent Fine Screen Installation, Startup, and Operator Training	6 days	3

C. The Bid shall include all associated expenses incurred by the technical representative during the jobsite visits.

D. Excluded from this time requirement shall be travel time, time spent at the table during shipping of equipment, time spent at the jobsite correcting any fabrication or manufacturing errors, and time spent preparing and operating the equipment to meet performance requirements.

E. Work Day: For all specifications, a "workday" and a "calendar day" shall both be defined as an eight (8) hour work period onsite, excluding all travel time to and from the site.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.1 Vendor's services shall conform to the requirements of Section 01 20 10 - Interface and Coordination Requirements with the following additional requirements:

A. At least 30 working days prior to equipment startup, the Vendor shall submit a detailed resume with appropriate qualifications of each individual proposed as a technical representative. Substitution of an accepted individual shall require notification and resume submittal at least 10 working days prior to the involvement, and shall be subject to the Engineer's review and acceptance. Minimum qualifications include previous startup experience at a minimum of two (2) projects with similar equipment.

B. Startup services and training of Owner's personnel shall be at such times as requested by the Owner. The Vendor shall submit an overall training plan and a detailed lesson plan for each training activity at least 7 working days prior to the training. The Owner shall notify the Vendor of the actual startup date, at least 15 working days prior to the startup date.

C. All Vendor on-site work hours shall be coordinated with the Owner.

D. Training sessions shall be performed between 8:00 a.m. and 2:30 p.m. Training sessions may be performed in the same day, however no training session for a single group shall last more than 4 hours.

E. The Vendor shall videotape all training sessions and provide a copy to Owner for continuing operator training.

F. A Vendor shall not be paid for field startup services which are unauthorized or made necessary due to delays, omissions, errors or defects for which that Vendor is responsible.

G. Each Vendor's erection supervisor(s) shall not assume executive charge of such work, but shall provide necessary direction so that the Owner, to the extent it follows the recommendations of each Vendor, shall be relieved for any claims by each Vendor when failure is due to erection, startup and operation during the employment of Vendor's Service Representative.

3.2 TESTING

A. The equipment shall not be considered ready for testing until the following conditions are satisfied:

1. Manufacturer's certification of equipment installation has been submitted to the Engineer.

2. Related Owner's Operation and Maintenance Manual and Final Shop Drawing have been accepted by the Engineer.

3. All required leakage tests, electrical tests, and electrical adjustments have been completed to the satisfaction of the Engineer.

4. All safety devices and equipment are installed, fully functional, adjusted, and tested.

B. All testing shall be witnessed by the Owner or Engineer to be considered valid.

C. Each Vendor shall provide all materials, labor and equipment to prepare all equipment furnished under the Contract to be brought online. Each Vendor's scope for field services is limited to supporting the equipment supplied and installed, under this procurement Contract.

END OF SECTION 01 20 20

SECTION 01 25 13 - PRODUCT SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This document describes the requirements for submission of product information and procedures for consideration of substitutions by Owner, including products proposed to be used by Vendor under "or equal" or "acceptable alternate" provisions.

B. Where equipment, materials or process have been specifically named, it is the intention of the Engineer to use these items. If a Vendor desires to have an alternate considered, they are to provide the following information. It will be the responsibility of the Vendor to convince the Engineer that the alternate materials are equal and will perform the intended function at or above that of the specified equipment. The burden of proof is on the Vendor to convince the Engineer that the product is equal for the purpose of a particular function.

C. Substitution or Alternative Product Options: The alternative materials shall be submitted to Engineer no less than 10 business days before the bid opening. Engineer shall evaluate the materials, and if Engineer approves the substitution, an addendum shall be issued allowing the equipment alternatives.

1.2 DEFINITIONS

A. The word "Products," as used herein, is defined to include purchased items form incorporation into the work, regardless of whether specifically purchased for the project or taken from Vendor's stock of previously purchased products. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of work. The word "Equipment" is defined as products with operation parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in the Contract Documents, including "specialties", "system", "structure", "finishes", "accessories", "furnishings", "special construction", and similar items, which are self-explanatory and have recognized meanings in the construction industry.

B. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying and erection of the Goods.

1.3 VENDOR'S OPTIONS

A. For products specified only by reference standards, select any product meeting standards, by any manufacturer.

B. For products specified by naming several products or manufacturers, select any product and manufacturer named.

C. For products specified by naming one or more products, but indicating the option of selecting equivalent products by stating "or equal" or "acceptable alternate" after specified product, Vendor must submit request, as required for substitution, for any product not specifically named.

1. "Or-Equal" Items: if in the Engineer's sole judgment an item of material or equipment proposed by Vendor is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by the Engineer as an "or-equal" item, in which case review and approval of the proposed item may in the Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purpose of the paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. It is at least equal in quality, durability, appearance, strength and design characteristics.

b. It will reliably perform at least equally well the function imposed by the design concept of the complete project as a functioning whole;

c. There is no increase in cost to the Owner, and

d. It will conform to the detailed requirements of the item named in the Contract Documents.

D. For products specified by name, brand, model, etc., the Vendor shall provide information as required below for the Engineer to review and determine under their sole discretion that the product is acceptable.

1.4 SUBSTITUTIONS

A. If in the Engineer's sole judgment an item of material or equipment proposed by Vendor does not qualify as an "or-equal" item, it will be considered a proposed substitute item and subject to the review process.

B. If Vendor wishes to furnish or use a substitute item of material or equipment, Vendor shall first make written application to the Engineer for review of a proposed substitute item of material or equipment. The application shall certify that the proposed substitute will perform adequately the function and achieve the results called for by the general design, be similar in substance to the specified and be suited to the same use that is specified.

C. The procedure for review by the Engineer will include the following:

1. If the Vendor wishes to provide a substitution item, the Vendor shall make written application to the Engineer.

2. Unless otherwise provided by law or authorized in writing by the Engineer, the request shall be submitted within a 35-day period after award of the Contract.

3. Wherever a proposed substitution item has not been submitted within said 35-day period, or wherever the submission of a proposed substitution material or equipment has been judged to be unacceptable by the Engineer, the Vendor shall provide the material or equipment indicated in the Contract Documents.

4. The Engineer will evaluate each proposed substitution within a reasonable period of time.

5. As applicable, no shop drawing submittals shall be made for a substitution item nor shall any substitution item be ordered, installed, or utilized without the Engineer's prior written acceptance of the Vendor's request.

6. The Engineer will record the time required by the Engineer in evaluating substitutions proposed by the Vendor and in making changes by the Vendor in Contract Documents occasioned thereby.

D. Vendor shall submit sufficient information as provided below to allow the Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and therefore an acceptable substitute therefore. Requests for review of proposed substitute items of materials or equipment will not be accepted by the Engineer from anyone other than the Vendor. Include the following minimum information in the application:

1. The Vendor shall certify that the proposed substitution will perform adequately the functions and achieve the results called for by the general design, and be similar and of equal substance to that indicated, and be suited to the same use as the specified.

2. For products:

   a. Product identification, including manufacturer's name and address.

   b. Manufacturer's literature:

      a) Product description

      b) Performance and test data

      c) Reference standards

3. Samples.

4. Name and address of similar projects on which product was used and date of installation.

5. All variations of the proposed substitute item for the specified shall be identified in the application and available engineering, sales, maintenance, repair and replacement service shall be indicated.

6. The application shall state the extent, if any, to which the use of the proposed substitute will prejudice Vendor's achievement of delivery on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provision of any other direct contract with Owner for work on the project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty.

7. Relation to separate contracts.

8. The application shall also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other sellers affected by any resulting change, all of which will be considered by the Engineer in evaluating the proposed substitute item.

E. In making request for substitution, Vendor shall:

1. Investigate proposed product or method and determine that it is equal or superior in all respects to that specified.

2. Provide the same guarantee for substitution as for product or method specified.

3. Coordinate installation of accepted substitution into work, making such changes as may be required for work to be complete in all respects.

4. Waive all claims for additional costs related to substitution which consequently become apparent.

5. Ensure cost data is complete and includes all related costs under this contract, but excludes:

a. Costs under separate contracts

b. Engineer's redesign

F. Substitutions will not be considered if:

1. They are indicated or implied on shop drawings or project data submittals without formal request submitted in accord with Paragraph 1.05.

2. Acceptance will require substantial revision of work.

G. Vendor shall provide all data in support of any proposed substitute or "or-equal" at Vendor's expense.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 25 13

SECTION 01 30 00 – VENDOR SUBMITTALS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Wherever submittals are required hereunder, all such submittals by the Vendor shall be submitted to the Engineer per schedule listed in the Agreement.

B. Within 15 days after the date of commencement as stated in the Notice to Proceed, the Vendor shall submit the following items to the Engineer for review:

1. A preliminary progress schedule indicating the starting date of manufacture and assembly, and shipping dates of the Goods.

2. A preliminary schedule of Shop Drawings, Samples, and proposed Substitutes ("Or-Equal") submittals listed in the Bid.

1.2 SHOP DRAWINGS

A. Wherever called for in the Contract Documents, or where required by the Engineer, the Vendor shall furnish to the Engineer for review, five (5) copies, plus one electronic copy, of each shop drawing submittal. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication, and installation drawings, erection drawings, list, graphs, catalog sheets, data sheets, and similar items.

1. Whenever the Vendor is required to submit structural design calculations as part of a submittal, such calculations shall bear the signature and seal of an engineer registered in the appropriate branch and in the state wherein the project is to be built, unless otherwise directed.

B. Verify that the material or equipment described in each submittal conforms to all requirements of the Specifications and drawings. All Vendor shop drawings submittals shall be carefully reviewed by an authorized representative of the Vendor, prior to submission to the Engineer. Each submittal shall be dated, signed, and certified by the Vendor, as being correct and in strict conformance with the Contract Documents. In the case of shop drawings, each sheet shall be so dated, signed, and certified. No consideration for review by the Engineer of any Vendor submittals will be made for any items which have not been so certified by the Vendor. All non-certified submittals will be returned to the Vendor without action taken by the Engineer, and any delays caused thereby shall be the total responsibility of the Vendor.

C. Where the detailed Specifications require specific submittal data, submit all data at the same time. A multiple page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the Engineer. Submittals are to be accompanied by the transmittal form attached at the end of this Section. The Engineer may return for resubmittal any information not accompanied by the specified transmittal form, properly completed.

1. Sequentially number the transmittal forms. Ensure that resubmittals have original number with an alphabetic suffix.

2. A separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required.

D. Except as may otherwise be indicated herein, the Engineer will return prints of each submittal to the Vendor with its comments. The Vendor shall make a complete and acceptable submittal to the Engineer by the second submission of a submittal item. The Owner reserves the right to withhold monies due to the Vendor to cover additional costs of the Engineer's review beyond the second submittal.

E. If copies of a submittal are returned to the Vendor marked "No Exceptions Taken" or "Furnish as Corrected", formal revision and resubmission of said submittal will not be required.

F. If a submittal is returned to the Vendor marked "Revise and Resubmit" or "Rejected", the Vendor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.

G. Fabrication of an item shall be commenced only after the Engineer has reviewed the pertinent submittals and returned copies to the Vendor marked either "No Exceptions Taken" or "Furnish as Corrected." Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements.

1.3 EFFECT OF ACCEPTANCE OF VENDOR INFORMATION

A. Acceptance by the Engineer of any drawings, method of work, or any information regarding materials or equipment the Vendor proposes to provide shall not relieve the Vendor of his responsibility for any errors therein and shall not be regarded as an assumption of risk or liability by the Engineer or Owner, or by any officer or employees thereof, and the Vendor shall have no claim under the contract on account of the failure or partial failure or inefficiency of any plan or method of work or material or equipment so accepted. Such acceptance shall be considered to mean merely that the Engineer has no objection to the Vendor using, upon his own full responsibility, the plan or method of work proposed, or providing the materials or equipment proposed.

B. Approval of shop drawings by the Engineer is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. The Vendor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication process and techniques of construction, coordination of his work with that of all other trades and the satisfactory performance of his work.

1.4 DEVIATIONS FROM CONTRACT

A. If the Vendor proposes to provide material or equipment which does not conform to all of the Specifications and Drawings, the transmittal form accompanying the submittal copies shall indicate under "comments" the deviations.

1.5 PRODUCT DATA AND SAMPLES

A. Where required in the Specifications and as determined by the Engineer, test specimens or samples of materials, appliances and fittings to be used or offered for use in connection with the work shall be submitted to the Engineer at the Vendor's expense, with information as to their sources, with all freight charges prepaid, and in such quantities and sizes as may be required for proper examination and tests to establish the quality or equality thereof, as applicable.

B. All samples and test specimens are to be submitted in ample time to enable the Engineer to make any tests or examinations necessary, without delay to the work. The Vendor will be held responsible for any loss of time due to the neglect or failure to deliver the required samples to the Engineer as specified.

C. Samples may also to be taken during the course of the work, as required by the Engineer.

D. Laboratory tests and examinations that the Owner elects to make will be made at no cost to the Vendor, except that, if a sample of any material or equipment proposed for use by the Vendor fails to meet the Specifications, the cost of testing subsequent samples will be borne by the Vendor.

E. All tests required by the Specifications to be performed by an independent laboratory are to be made, and the samples therefore furnished shall be at the sole expense of the Vendor.

F. Material used in the work is to conform to the submitted samples and test certificates as approved by the Engineer.

1.6 VENDOR'S SCHEDULES

A. Within 15 calendar days after the Commencement Date in the Notice to Proceed, the Vendor shall furnish the Owner and the Engineer a schedule showing the dates that manufacturing and assembly is to start and shipment is to commence. This schedule shall be developed and followed to ensure the timely review and approval of shop drawings, and delivery of the equipment. The schedule shall be subject to the Engineer's review and Vendor resubmittal of the schedule shall be as required by the Engineer.

1.7 OWNER'S OPERATIONS AND MAINTENANCE MANUAL

A. Refer to requirements in Section 01 78 23 – Operation and Maintenance Data.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 30 00

STANDARD SUBMITTAL FORM

DATE: _____ SUBMITTAL NO._____

FROM: _____ TO: _____
(To be completed afterward)

_____ _____

_____ _____

Vendor: This is: (Check one)

_____ An Original Submittal_____

_____ A 2nd Submittal_____

_____ A ___ Submittal_____

Previous Submittal Nos. _____

No. of Submittal Copies _____

SPECIFICATION OR SUBJECT OF SUBMITTAL	EQUIPMENT DESIGNATION	DRAWING REFERENCE

We have verified that this submittal contains all applicable material and information required for evaluation against the project Specifications. Furthermore, we submit these items, which comply with the Drawings and Specifications (check one):

____ With no exceptions

____ Except for the following deviations

NO.	DEVIATIONS

_____
Vendor's Authorized Representative

SECTION 01 30 10 – SCHEDULE OF PAYMENTS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section defines the partial payment milestones and the corresponding payment amount, specified as a percent of the lump sum total contract price as submitted on Vendor's bid forms.

1.2 SCHEDULE OF PAYMENTS

A. The schedule of payments, less retainage, for the supplying of the Goods and Special Services shall be based on the following schedule:

1.	Upon Approved Submittals	10%
2.	Upon Delivery of all Goods	70%
3.	Upon Successful Startup	10%
4.	After O&M Manual is Approved and Training Complete	5%
5.	Upon Final Completion	5%

B. No payments shall be made beyond 90 percent until the Owner's Manuals have been received and approved by Owner.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 30 10

SECTION 01 31 50 – DELIVERY OF GOODS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The required delivery date for the Goods shall be as set forth in these Contract Documents and approved by the Engineer.

1.2 EQUIPMENT DELIVERY

A. The Vendor shall deliver the Goods to the Installation Contractor or Owner as necessary to meet the approved schedule. The Vendor shall be prepared to ship the Goods from the storage location or Vendor plant within twenty (20) calendar days of Vendor's receipt of written notice from the Engineer or Installation Contractor or Owner to ship.

1. The Vendor shall include the cost of shipment of all equipment associated with the Goods to the Point of Destination for the Installation Contractor or Owner in its lump sum bid.

2. The Vendor shall notify the Owner five (5) working days prior to shipment of the equipment, of the details of the shipping schedule.

3. The Vendor shall prepare all articles and materials for shipment in such a manner as to protect them from damage in transit. The Vendor shall be responsible for and make good any and all damage due to improper preparation and loading or unloading for shipment and shall ship to the location(s) designated herein.

4. Goods shall be unloaded by the Installation Contractor or Owner at the site. The Vendor shall provide detailed instructions for off-loading and storage of equipment. The Vendor is hereby notified that all truck unloading activities may occur immediately upon receipt of shipment, and that the unloading activity will not be delayed to accommodate the schedule of the individual(s) designated by the Vendor to supervise unloading. The Vendor shall supply all special tools, slings, and components necessary for unloading Vendor's equipment. Such tools, slings, and components shall be included with the shipment in a separate, clearly marked container. Any articles or materials that might otherwise be lost shall be boxed or wired in bundles and plainly marked for identification.

5. The Vendor shall obtain All Risk Transit Insurance covering the value of the materials and equipment being transported to the Project site. This shall include ocean cargo coverage as applicable.

B. The Vendor will arrange to have the Goods delivered to the project site between 8:00 A.M. and 3:30 P.M., Monday to Friday, except statutory holidays. The Owner shall not be responsible for Goods delivered outside the acceptable time for delivery.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 31 50

SECTION 01 42 13 - ABBREVIATIONS AND ACRONYMS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Wherever in these Specifications references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these Specifications, the following acronyms or abbreviations which may appear in these Specifications shall have the meanings indicated herein.

1.2 ABBREVIATIONS

1.3 ACRONYMS

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AI	The Asphalt Institute
AlA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association

ANS	American Nuclear Society
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association (or) American Parquet Association, Inc.
API	American Petroleum Institute
APWA	American Public Works Association
ARI	Air-Conditioning and Refrigeration Institute
ASA	Acoustical Society of America
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASNT	American Society of Nondestructive Testing
ASQC	American Society for Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWCI	American Wire Cloth Institute
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BBC	Basic Building Code, Building Officials and Code Administrators
BHMA	Builders Hardware Manufacturer's Association
CBM	Certified Ballast Manufacturers
CDA	Copper Development Association
CEMA	Conveyors Equipment Manufacturer's Association

CGA	Compressed Gas Association
CLFMI	Chain Link Fence Manufacturer's Institute
CLPCA	California Lathing and Plastering Contractors Association
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
DCDMA	Diamond Core Drill Manufacturer's Association
DEQ	Department of Environmental Quality
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
DOE	Department of Ecology
DWR	Department of Water Resources
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
EPA	Environmental Protection Agency
FCI	Fluid Controls Institute
FM	Factory Mutual System
FPL	Forest Products Laboratory
HI	Hydronics Institute (or) Hydraulics Institute
HPMA	Hardwood Plywood Manufacturers Association
IAPMO	International Association of Plumbing and Mechanical Officials
IBC	International Building Code
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IFC	International Fire Code
IME	Institute of Makers of Explosives

IP	Institute of Petroleum (London)
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
ISDSI	Insulated Steel Door Systems Institute
ISEA	Industrial Safety Equipment Association
ISO	International Organization for Standardization
ISPWC	Idaho Standards for Public Works Construction
ITE	Institute of Traffic Engineers
MBMA	Metal Building Manufacturer's Association
MIL	Military Standards (DoD)
MPTA	Mechanical Power Transmission Association
MSS	Manufacturers Standardization Society
MTI	Marine Testing Institute
NAAMM	National Association of Architectural Metal Manufacturer's
NACE	National Association of Corrosion Engineers
NAGDM	National Association of Garage Door Manufacturers
NB	National Board of Boiler and Pressure Vessel Inspectors (alternate NBBPVI)
NBS	National Bureau of Standards (Now NIST)
NCCLS	National Committee for Clinical Laboratory Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association (or) National Fluid Power Association (or) National Forest Products Association
NISO	National Information Standards Organization
NLGI	National Lubricating Grease Institute
NMA	National Microfilm Association

NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association
NWWDA	National Wood Window and Door Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PPI	Plastics Pipe Institute
RCRA	Resource Conservation and Recovery Act
RIS	Redwood Inspection Service
RMA	Rubber Manufacturers Association
RVIA	Recreational Vehicle Industry Association
RWMA	Resistance Welder Manufacturer's Association
SAE	Society of Automotive Engineers
SAMA	Scientific Apparatus Makers Association
SDI	Steel Door Institute
SMA	Screen Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SPI	Society of the Plastics Industry, Inc.
SPIB	Southern Pine Inspection Bureau
SPR	Simplified Practice Recommendation
SSA	Swedish Standards Association
SSBC	Southern Standard Building Code, Southern Building Code Congress
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
TAPPI	Technical Association of the Pulp and Paper Industry
TFI	The Fertilizer Institute
TIA	Telecommunications Industries Association

UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriters Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WEF	Water Environment Federation
WIC	Woodwork Institute of California
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 42 13

SECTION 01 45 00 - QUALITY CONTROL

PART 1 - GENERAL

1.1 DEFINITION

A. The term Quality Control includes inspection, sampling and testing, and associated requirements.

1.2 SUBMITTALS

A. Submit testing results in accordance with Section 01 30 00 – Vendor Submittals.

B. For Engineer and Owner approval, the Vendor shall submit testing laboratory's qualifications and certifications prior to entering into a contractual agreement to perform quality control testing and inspection work.

C. Reports of testing will be submitted to the Engineer indicating observations and results in test and indicating compliance or non-compliance with Contract Documents. It is the responsibility of the Vendor to ensure these submittals are provided in a timely manner to reduce cost impact of potential removal of defective work.

1.3 INSPECTION AT PLACE OF MANUFACTURE

A. Unless otherwise indicated, all products, materials, and equipment shall be subject to inspection by the Engineer at the place of manufacture.

B. The presence of the Engineer at the place of manufacturer, however, shall not relieve the Vendor of the responsibility for furnishing products, materials, and equipment which comply with all requirements of the Contract Documents. Compliance is a duty of the Vendor, and said duty shall not be avoided by any act or omission on the part of the Engineer.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.1 INSTALLATION

A. Inspection: The Vendor shall inspect materials or equipment upon their arrival on the job site and immediately prior to installation, and reject damaged and defective items.

B. Measurements: The Vendor shall verify measurements and dimensions of the work as an integral step of starting each installation.

END OF SECTION 01 45 00

SECTION 01 75 16 – STARTUP PROCEDURES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Equipment testing and startup are requisite to satisfactory completion of the contract and, therefore, shall be completed within the contract time.

B. The Vendor shall coordinate with the Installation Contractor or Owner all work necessary for the successful operation of the Goods.

C. During all equipment testing startup and acceptance test periods, the Owner shall ensure that experienced, trained, and qualified personnel are onsite at all times to oversee and safeguard such testing and operations.

1.2 SUBMITTALS

A. Testing and Startup Plan: Not less than 60 days prior to startup, the Vendor shall submit for review a detailed Testing and Startup Plan. The Plan shall include schedules for equipment certifications, submittal of final Owner's Manuals, training of the Owner's personnel, electrical testing, and a detailed schedule of operations to achieve successful equipment plant testing, startup, performance and acceptance testing and activities to implement the 7-day and 30-day tests. The Plan shall include test checklists and data forms for each item of equipment and shall address coordination with the Owner's staff. The Vendor and Owner shall revise the Plan as necessary based on review comments.

B. System Outage Requests: Request for shutdown of on-line systems as necessary to test or start up equipment. Shutdown requests must be submitted at least two weeks prior to shutdown and shall be approved by Owner.

C. Records and Documentation:

1. Submit documentation that the equipment has been properly installed, is in accurate alignment, is free from undue stresses from connecting piping and anchoring, and has operated satisfactorily under full load conditions.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.1 GENERAL

A. Prior to scheduling any operations testing, the Vendor shall have previously furnished the Owner's Manuals required under Section 01 78 23 – Operation and Maintenance Data.

B. The Vendor shall coordinate the scheduling of all operations testing. The Vendor is advised that the Engineer and the Owner's operating personnel will witness operations testing and that the equipment supplier's representative shall be required to instruct the Owner's operating personnel in correct operation and maintenance procedures.

C. The Vendor shall notify the Engineer at least 7 days in advance for testing installed equipment.

3.2 FACTORY ACCEPTANCE TESTING

A. The Vendor shall be responsible for conducting a factory acceptance test and achieving Engineer approval as to the outcome of the test prior to the field installation of the equipment, if required by the specifications for the equipment.

B. The Vendor is advised that the Engineer and the Owner's operating personnel may witness factory testing.

C. The Vendor shall be responsible for scheduling all factory acceptance testing. The Vendor shall coordinate the factory acceptance testing schedule with the Engineer at least 1 week in advance.

D. Factory acceptance testing shall be conducted per the requirements in the equipment specifications.

3.3 EQUIPMENT INSTALLATION AND TESTING

A. The Vendor shall arrange to have the manufacturer's representative revisit the job site as often as necessary until any and all trouble is corrected and the equipment installation and operation are satisfactory to the Vendor and Engineer.

B. The Vendor shall require that each manufacturer's representative furnish to the Engineer a written certification addressed to the Owner certifying that the equipment has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting piping or anchor bolts, and has been operated satisfactorily and tested under full-load conditions.

END OF SECTION 01 75 16

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Owner shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the Contract). Such dates shall be established not less than two weeks prior to beginning any of the foregoing items, to allow the Vendor, Installation Contractor, Engineer, and their authorized representatives sufficient time to schedule attendance at such activities.

1.2 FINAL SUBMITTALS

A. The Vendor, prior to requesting final payment, shall obtain and submit the following items to the Engineer for transmittal to the Owner:

1. Written guarantees, where required.

2. Owner's Operation and Maintenance Manuals as specified in Section 01 78 23 - Operation and Maintenance Data.

3. Recommended spare parts; special tools.

4. Certificates indicating that all tests and activities required by Section 01 75 16 - Startup Procedures have been successfully completed to the satisfaction of the Engineer.

5. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

1.3 MAINTENANCE AND GUARANTEE

A. The Vendor shall comply with the maintenance and guarantee requirements contained in the General Conditions.

B. The Vendor shall make all repairs and replacements promptly upon receipt of written order from the Owner. If the Vendor fails to make such repairs or replacements promptly, the Owner reserves the right to do the Work and the Vendor and its surety shall be liable to the Owner for the cost thereof.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Vendor shall submit technical operation and maintenance information for each item of mechanical and electrical equipment in an organized manner in the Owner's Manual. It shall be written so that it can be used and understood by the Owner's operation and maintenance staff. The Owner's Manual information shall also be submitted in electronic format using a USB flash drive.

1.2 OWNER'S MANUAL

A. The Owner's Manual shall include the following for each item of mechanical and electrical equipment (as applicable):

1. Equipment Summary: A summary table shall include the equipment name and equipment number, the manufacturer's model number, serial number, and other nameplate information specific to the equipment provided.

2. Operational Procedures: Manufacturer-recommended procedures on the following shall be included:

    a. Installation

    b. Adjustment

    c. Startup

    d. Location of controls, special tools, equipment required, or related instrumentation needed for operation

    e. Operation procedures

    f. Load changes, Calibration, Shutdown

3. Troubleshooting, Disassembly, Reassembly

    a. Realignment

    b. Testing to determine performance efficiency

    c. Tabulation of proper settings for all pressure relief valves, low and high pressure switches, and other protection devices

    d. List of all electrical relay settings including alarm and contact settings

4. Preventive Maintenance Procedures:

   a. Procedures: Preventive maintenance procedures shall include all manufacturer-recommended procedures to be performed on a periodic basis, both by removing and replacing the equipment or component, and by leaving the equipment in place.

   b. Schedules: Recommended frequency of preventive maintenance procedures shall be included. Lubrication schedules, including lubricant SAE grade, type, and temperature ranges, shall be covered.

5. Parts List and Drawings:

   a. Parts List: A complete parts list shall be furnished, including a generic description and manufacturer's identification number for each part. Addresses and telephone numbers of the nearest supplier and parts warehouse shall be included.

   b. Drawings: Cross-sectional or exploded view drawings shall accompany the part list.

6. Wiring Diagrams: Include complete internal and connection wiring diagrams for electrical equipment items.

7. Shop Drawings: Include approved shop or fabrication drawings, complete with dimensions. Include performance curves for pumps furnished.

8. Safety: This part describes the safety precautions to be taken when operating and maintaining the equipment or working near it.

9. Documentation: All equipment warranties, affidavits, and certifications required by the Technical Specifications shall be placed in this part.

10. Spare Parts: This part shall contain spare parts information for all mechanical, electrical, and instrumentation equipment. The spare parts list shall include the current list price of each spare part. The spare parts list shall be limited to those spare parts which each manufacturer recommends be maintained by the Owner in inventory at the plant site. Each manufacturer or supplier shall indicate the name, address, and telephone number of its nearest outlet of spare parts to facilitate the Owner in ordering. The Vendor shall cross-reference all spare parts lists to the equipment numbers designated in the Contract Documents.

B. If manufacturer's standard brochures and manuals are used to describe operating and maintenance procedures, modify such brochures and manuals **to reflect only the model or series of equipment used on this project and features provided**. Cross out neatly or remove extraneous material, or otherwise annotate or eliminate.

1.3 TRANSMITTAL PROCEDURE

A. Provide three (3) original paper copies and one (1) electronic copy in PDF format of all operating and maintenance information. For ease of identification, label each manufacturer's brochure and manual with the equipment name. Organize the information in 3-ring binders and use an indexing feature within the PDF submission, in numerical order, per specification section number. Include in the manuals a table of contents and tab sheets to permit easy location of desired information. Each binder shall include a cover sheet and spine label giving the project name, Engineer's project number, and Vendor name and contact information.

B. The Vendor shall submit to the Engineer three identical Owner's Manuals a minimum of 90 calendar days prior to the scheduled startup of the equipment.

C. The Engineer will review the Owner's Manuals within 30 days following their receipt by the Engineer. The Vendor shall then make any corrections and changes noted and compile all the corrected Owner's Manuals for final submittal to the Engineer.

1.4 PAYMENT

A. Acceptable operating and maintenance information for the project must be delivered to the Engineer prior to the project being 80 percent complete or at least two weeks prior to startup of any equipment. Progress payments for work in excess of 90 percent completion or 2 weeks prior to startup will not be made until the specified acceptable operating and maintenance information has been delivered to the Engineer.

1.5 FIELD CHANGES

A. Following the acceptable installation and operation of an equipment item, the item's instructions and procedures are to be modified and supplemented to reflect any field changes or information requiring field data.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 78 23

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install miscellaneous metal items as shown on the drawings and specified herein.

1.2 STANDARDS

A. AISC "Code of Standard Practice."

B. AWS "Code for Welding in Building Construction."

1.3 SUBMITTALS

A. Shop Drawings: Prepare and submit shop drawings for miscellaneous metal items prior to fabrication. Identify items with location and drawing or specifications reference. Show connections, anchors, anchor or fastener spacing dimensions and details.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect materials from moisture with waterproof paper, tarpaulin or polyethylene sheeting.

PART 2 - PRODUCTS

2.1 MATERIALS

A. HSS (Hollow Structural Shapes): ASTM A500 Grade B

B. Bars, plates, miscellaneous shapes: ASTM A36

C. Aluminum: Alloy 5052-H32, mill finish

D. Pipe: Steel pipe shall be ASTM A120 Galvanized Steel. Aluminum pipe shall be ASTM B241 alloy 6061 – T6

E. Miscellaneous Bolts and Nuts: ASTM A307

F. High Strength Bolts and Nuts: ASTM F3125 Grade A325

G. Concrete Anchors: Use cast in anchor bolts where cast in anchor bolts are shown on the drawings. Provide attachment to concrete with concrete anchors where shown on the drawings conforming to the following types. Use only type of concrete anchor shown on the drawings.

1. Expansion Anchors: Expansion anchors shall be wedge type with a single piece three section wedge to anchor the stud in the hole. The stud nut and wedge shall be ANSI 304 stainless steel.

2. Adhesive Anchors: Adhesive anchors shall be an all thread rod with a nut. The all thread rod and nut shall be ANSI 304 stainless steel. The rod shall be anchored in the hole using a premeasured adhesive capsule consisting of vinyl urethane methacrylate adhesive.

3. Undercut Anchors: Undercut anchors shall be an undercut style with a brazed tungsten carbide edge on the undercutting end to perform the self-cutting undercut as the anchor is installed. The anchor shall cut and undercut bearing area of at least 2.5 times the nominal anchor bolt size. The anchor stud shall be ANSI 316 stainless steel.

H. Stainless Steel Bolts and Nuts: Type 316 Stainless Steel, unless otherwise noted

2.2 BOLTS AND ANCHORS

A. Standard Service (Non-Corrosive Application): Unless otherwise indicated, bolts, anchor bolts, washers, and nuts shall be steel as indicated herein. Threads on galvanized bolts and nuts shall be formed with suitable taps and dies such that they retain their normal clearance after hot-dip galvanizing. Except as otherwise indicated, steel for bolt material, anchor bolts and cap screws shall be in accordance with the following:

Structural Connections	ASTM A307, Grade A or B, hot-dip galvanized
Anchor Bolts	ASTM A307, Grade A or B, or ASTM A36, hot-dip galvanized
High Strength Bolts	ASTM F3125 Grade 325
Pipe and Equipment Flange Bolts	ASTM A193, Grade B- 7

B. Stainless steel bolts and nuts for corrosive service

1. Corrosive Service: All bolts, nuts, and washers in the locations listed below shall be stainless steel as indicated below.

a. All buried locations.

b. All submerged locations.

c. All locations subject to seasonal or occasional flooding.

d. Inside hydraulic structures below the top of the structure.

e. Inside buried vaults, manholes, and structures which do not drain through a gravity sewer or to a sump with a pump.

f. All chemical handling areas.

g. Inside trenches, containment walls, and curbed areas.

h. Locations indicated by the Contract Documents or designated by the ENGINEER to be provided with stainless steel bolts.

2. Unless otherwise indicated, stainless steel bolts, anchor bolts, nuts, and washers shall be Type 316 stainless steel, Class 1, conforming to ASTM A193 for bolts and to ASTM A194 for nuts. All threads on stainless steel bolts shall be protected with an antiseize lubricant suitable for submerged stainless steel bolts, to meet government specification MIL-A-907E. Buried bolts in poorly drained soil shall be coated the same as the buried pipe.

a. Antiseize lubricant shall be classified as acceptable for potable water use by the NSF.

b. Antiseize lubricant shall be "PURE WHITE" by Anti-Seize Technology, Franklin Park, IL, 60131, AS-470 by Dixon Ticonderoga Company, Lakehurst, NJ, 08733, or equal.

C. Bolt Requirements: The bolt and nut material shall be free-cutting steel. The nuts shall be capable of developing the full strength of the bolts. Threads shall be Coarse Thread Series conforming to the requirements of the American Standard for Screw Threads. All bolts and cap screws shall have hexagon heads and nuts shall be Heavy Hexagon Series.

D. Bolts and nuts shall be installed with washers fabricated of material matching the base material of bolts, except that hardened washers for high strength bolts shall conform to the requirements of the AISC Specification. Lock washers fabricated of material matching the bolts shall be installed where indicated.

E. The length of each bolt shall be such that after the joint is made up, the bolt extends through the entire nut, but in no case more than 1/2 inch beyond the nut.

F. Adhesive Anchors: Unless otherwise indicated, all drilled, concrete or masonry anchors shall be adhesive anchors. No substitutions will be considered unless accompanied with ICBO report verifying strength and material equivalency.

1. Adhesive anchors are required for drilled anchors for indoor installations, in submerged, wet, splash, overhead, and corrosive conditions, and for anchoring reinforcing bars. Threaded rod shall be stainless steel Type 316. Epoxy adhesive shall be Hilti HIT RE 500 V3.

2. Unless otherwise indicated, glass capsule, polyester resin adhesive anchors will be permitted in locations not included above and shall be Hilti HVA or Cobra Anchors. Threaded rod shall be galvanized steel.

G. Expanding-Type Anchors: Expanding-type anchors if indicated or permitted, shall be galvanized steel expansion type ITW Ramset/Redhead "Trubolt" anchors; Hilti "Kwik-Bolt;" or equal. Lead caulking anchors will not be permitted. Size shall be as indicated. Embedment depth shall be as the manufacturer recommends for the load to be supported. Expansion type anchors which are to be embedded in grout may be steel. Non-embedded buried or submerged anchors shall be stainless steel.

H. Overhead Applications: Use Hilti HDA undercut anchors.

2.3 POWDER-DRIVEN PINS

A. Power-driven pins to be installed in concrete or steel shall be heat-treated steel alloy. If the pins are not inherently sufficiently corrosion-resistant for the conditions to which they are to be exposed, they shall be protected in an acceptable manner. Pins shall have capped or threaded heads capable of transmitting the loads the shanks are required to support. Pins that are connected to steel shall have longitudinal serrations around the circumference of the shank. Complete information describing pin capacities, connections, and proposed use locations shall be submitted to the Engineer.

2.4 IMPACT ANCHOR

A. Impact anchors shall be an expansion type anchor in which a nail type pin is driven to produce the expansive force. The pin shall have a zinc sleeve with a mushroom style head and stainless steel nail pin. Anchors shall be Metal HIT Anchors, manufactured by Hilti, Inc., Rawl Zamac Nailin, manufactured by the Rawlplug Company; or equal.

2.5 FABRICATION

A. Fabrication of Miscellaneous Metal Items:

1. Workmanship: Conform to accepted shop practices. Form work true to details, with clean, straight, sharply defined profiles. Unless otherwise shown or specified, finish exposed welds flush and smooth.

2. Joints and Connections: Weld all joints, unless other fastening methods are shown, specified or specifically approved. Close fit exposed joints; making joints where least conspicuous. Unless otherwise shown or specified, use flat and countersunk beaded bolts or screws in exposed connections.

3. Cutting, Drilling; Perform cutting, drilling, punching required for accurate fitting and assembly work. In addition, perform similar operations as required for attachment of work of other trades, provided that directions for such work are supplied prior to shop drawing approvals.

4. Provisions for Attachment to Structure: Furnish miscellaneous metal items complete with framing, supports, hangers, bracing, anchors, and other devices shown specified or necessary for reinforcement and proper, secure setting or attachment to building construction.

B. Dissimilar Materials Protection: Insulate aluminum surfaces in contact with metals other than galvanized or stainless steel, or with plaster or concrete, by means of chromate gasketing or heavy coat of alkali-resistant bituminous paint.

C. Workmanship: Fabricate all items neatly and rigidly in accordance with details in first-class finished, workmanlike manner. Form curved work neatly to radii indicated. Provide members of sizes indicated and weld, bolt or rivet securely together. Furnish bolts, nuts, washers, and other fastening devices required for anchoring and securing work.

D. Welding: Use electric shielded-arc process in accordance with Welding Specifications of American Welding Society. Use only welding operators properly trained and highly skilled in arch welding. Grind smooth surface welds exposed to view.

2.6 SHOP FINISHING

A. Steel Metal Items: Galvanize all iron or steel items. Prior to galvanizing, all items after fabrication shall be cleaned thoroughly, removing scale, flux deposits, rust, oil, dirt, and other foreign matter. Except as otherwise indicated, iron or steel items specified to be galvanized shall be hot-dip galvanized after fabrication in accordance with ASTM A123. Fabricate units complete or in largest practical sections before galvanizing.

B. Aluminum Metal Items: Aluminum shall be finished with a 0.7 mil clear anodized finished. Other aluminum items shall be mill finish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Embedded Items: Deliver miscellaneous metal items to be embedded or installed in concrete with setting instruction to concrete contractor for setting. Verify grade and line positioning of items as set, report errors or deviations in order that corrective adjustments may be made before placement of concrete or laying of masonry.

B. Coat all aluminum surfaces in contact with concrete with an approved bituminous coating or zinc chromate primer.

3.2 GENERAL

A. Install work, other than that to be embedded in concrete, in strict accordance with drawings. Perform cutting, drilling, and fitting required. Accurately set, place and properly, securely attach work in true planes, alignment, plumb and level; properly, adequately reinforce and stiffen.

B. Concrete Anchors: Install concrete anchors in cast in place concrete and masonry according to the details shown on the drawings and as recommended by the anchor manufacturer. When installing concrete anchors in masonry always install anchors in masonry cells that have been grouted solid. Do not install anchors into hollow cell masonry.

C. Expansion, Contraction: Assemble and install work with adequate provisions to prevent objectionable distortion and overstressing from expansion, contraction. Where necessary, provide properly designed expansion joints, construct to be weather tight if to be exposed to the weather.

D. Field Touch-up: After installation of miscellaneous metal items, tough-up field bolts, field welds, uncoated connections and abrasions with ship protective coatings. Clean items of mud, dirt, and other objectionable foreign matter.

END OF SECTION 05 50 00

SECTION 26 05 00 – ELECTRICAL, GENERAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to all of Division 26 Specification Sections. This Section applies to all Division 26 Specifications and Electrical Drawings.

1.2 QUALITY ASSURANCE

A. Comply with latest NEC, NFPA, UBC, UFC, UL and applicable Local and State Codes. Also comply with Utility Company regulations and industry standards and these Drawings.

B. Work shall be done by only trained, licensed, and experienced workmen familiar with the requirements.

C. All microprocessor-based equipment and software with equipment shall utilize 4 digits for the year part of all dates. A two-digit date shall be an option for printing at Owner's preference.

1.3 EXTENT OF DRAWINGS / SPECIFICATION

A. Drawings indicate intent and general layout of electrical systems for the Project. Drawings are partly diagrammatic and do not indicate all fittings and accessories which may be required. Provide such fittings and accessories as required to form a complete and operating system in general conformance with specifications and drawings.

1.4 PRIOR APPROVALS

A. Unless directed otherwise by Division 1, all products submitted for prior approval shall be received by the Engineer 10 business days prior to Bid. Supply technical data, photometrics and dimensional Drawings showing that substitutes are equal to product specified. Faxed prior approvals will not be accepted.

1.5 DISCREPANCIES

A. The more stringent provisions shall take precedence where codes, specifications and drawings differ with one another. The Vendor shall Bid the more expensive requirement, unless discrepancy is addressed by Addendum prior to Bid.

1.6 SHOP DRAWING SUBMITTALS

A. General: Follow the procedures specified in Section 01 30 00 – Vendor Submittals. Submit for final and official approval through the Engineer.

B. Provide the number of electrical related Shop Drawings, product data, and samples submitted, to allow for required distribution.

1. Engineer - 2 copies.

C. All Shop Drawings shall be bound in Duo-Tang, Mead, or equivalent folders. Provide title sheet for each Section indicating the Specification number and name. Copies of price list sheets not acceptable. Manufacturer's name and address must appear on each sheet.

1.7 MAINTENANCE MANUALS

A. Prepare maintenance manuals in accordance with Section 01 77 00 – Closeout Procedures. In addition to the requirements specified in Division 1 assemble O & M Manuals as follows:

1. Compile Operating and Maintenance Manuals for the electrical systems and equipment. The manuals shall be provided to the Engineer for approval complete and at one time, prior to requesting final payment. Partial or separate data will be returned for completion.

2. Manuals shall be assembled in three-ring binders. Binders shall be 3-inch thick or less and have slip sleeve jacket on binder side and front. More than one binder shall be used for each set of data if required to prevent overfilling of one binder. All information shall be arranged in Sections and each Section shall have a blank buff colored, heavy paper divider with a protruding tab clearly labeled. Sections shall be arranged in the same order that the equipment is listed in the Specification and each Section shall have a separate tab. Shop Drawings which are larger than 8-1/2-inch by 11 inch shall be individually folded so they are 8-1/2-inch by 11 inch or less and inserted behind the appropriate tab.

3. Tabs shall be labeled and arranged as follows:

a. Index: Furnish under the first tab an index of Sections listing name of Section and Specification numbers.

b. Equipment Manufacturers: Furnish under the second tab a complete typed list of equipment suppliers and manufacturer's representative including type of equipment, name, address and phone number. The company listed here should be the one which could furnish replacement parts and offer technical information about the equipment.

c. Product Literature: Each tab, starting with the third shall contain the name of a Specification Section. Behind each tab shall be the previously submitted and approved Shop Drawing, factory published operation and maintenance instructions and parts lists. Also include description of function, normal operating characteristics and limitations, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions. Servicing instructions and lubrication charts and schedules.

4. Upon completion and approval of the booklets, one copy shall be given to the Architect, and two to the Owner. Using the booklet, the Vendor shall explain in detail and instruct the Owner's operating personnel in the correct operation and maintenance of the equipment.

PART 2 - PRODUCTS

2.1 RACEWAY AND CABLE LABELS

A. Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

1. Color: Black letters on orange field.

2. Legend: Indicates voltage.

B. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl with legend overlaminated with a clear, weather- and chemical-resistant coating.

C. Pretensioned, Wraparound Plastic Sleeves: Flexible, preprinted, color-coded, acrylic band sized to suit the diameter of the line it identifies and arranged to stay in place by pretensioned gripping action when placed in position.

D. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

2.2 NAMEPLATES

A. Engraved Plastic Nameplates: Engraving stock, melamine plastic laminate, minimum 1/16-inch thick for signs up to 20 sq. in. and 1/8-inch thick for larger sizes.

1. Engraved legend with white letters on black face.

2. Punched or drilled for mechanical fasteners.

2.3 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16-inch.

2. Tensile Strength: 50 lb minimum.

3. Temperature Range: Minus 40 to plus 185 deg F.

4. Color: According to color-coding.

B. Paint: Formulated for the type of surface and intended use.

1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.

2. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION REQUIREMENTS

A. Install items level, plumb, and parallel and perpendicular to other components, except where otherwise indicated.

B. Install equipment to facilitate service, maintenance, and repair or replacement of components.

3.2 ELECTRICAL SUPPORTING METHODS

A. Dry Locations: Steel materials.

B. Strength of Supports: Adequate to carry all present and future loads, times a safety factor of at least 4; 200 lb minimum design load.

3.3 GENERAL INSTALLATION OF MATERIALS

A. Install wires according to manufacturer's written instructions and NECA's "Standard of Installation."

B. Conductor Splices: Keep to the minimum and comply with the following:

1. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

2. Use splice and tap connectors that are compatible with conductor material.

C. Connect outlets and components to wiring systems and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals according to tightening requirements specified in UL 486A.

D. Install devices to securely and permanently fasten and support electrical components.

E. Raceway Supports: Comply with NFPA 70 and the following requirements:

1. Conform to manufacturer's recommendations for selecting and installing supports.

2. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.

3. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

4. Support individual horizontal raceways with separate, malleable iron pipe hangers or clamps.

5. Spring Steel Fasteners: Specifically designed for supporting single conduits or tubing. May be used in lieu of malleable iron hangers for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to channel and slotted angle supports in accordance with NEC.

F. Miscellaneous Supports: Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices except where components are mounted directly to structural features of adequate strength.

G. Fastening: Unless otherwise indicated, securely fasten electrical items and their supporting hardware to the building structure. Perform fastening according to the following:

1. Fasten by means of wood screws or screw-type nails on wood; toggle bolts on hollow masonry units; concrete inserts or expansion bolts on concrete or solid masonry; and by machine screws, welded threaded studs, or spring-tension clamps on steel.

2. In partitions of light steel construction use sheet-metal screws.

3. Select fasteners so the load applied to any fastener does not exceed 25 percent of the proof-test load.

3.4 LABEL INSTALLATION

A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.

C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before applying.

E. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.

F. Color-Coding of Secondary Phase Conductors: Use the following colors for service, feeder and branch-circuit phase conductors:

1. 208/120-V Conductors:

   a. Phase A: Black.

   b. Phase B: Red.

   c. Phase C: Blue.

   d. Neutral: White.

   e. Ground: Green.

2. 480/277-V Conductors:

   a. Phase A: Brown.

   b. Phase B: Orange.

   c. Phase C: Yellow.

   d. Neutral: Gray.

   e. Ground: Green.

3. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 6 AWG:

   a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1 inch wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.

G. Apply identification to conductors as follows:

1. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.

2. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.

H. Apply warning, caution, and instruction signs as follows:

1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

2. Emergency Operation: Install engraved laminated signs with white legend on red background with minimum 3/8-inch high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

I. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2-inch high lettering on 1-1/2 inch high label; where two lines of text are required, use labels 2 inches high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment using mechanical fasteners:

1. Panelboards, electrical cabinets, and enclosures.

2. Access doors and panels for concealed electrical items.

3. Electrical switchgear and switchboards.

4. Disconnect switches.

5. Enclosed circuit breakers.

6. Motor starters.

7. Push-button stations.

8. Contactors.

9. Remote-controlled switches.

10. Control devices.

J. For panelboards, provide framed type circuit schedules with identification of items controlled by each breaker. Indicate room numbers of items controlled or room name where appropriate for Owners convenience. Final schedules shall be typed or printed for clarity. Handwritten schedules are not acceptable. Schedules shall be posted inside each panel door mounted in transparent card holder upon project completion.

END OF SECTION 26 05 00

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes wires, cables and connectors for power, lighting, signal, control and related systems rated 600 V and less.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers complying with the Quality Assurance requirements are acceptable.

2.2 WIRES AND CABLES

A. General: Provide wire and cable suitable for the temperature, conditions and location where installed.

B. Conductors: Provide solid or stranded conductors for power and lighting circuits No. 10 AWG and smaller. Provide stranded conductors for sizes No. 8 AWG and larger.

C. Conductor Material: Copper for all wires and cables. Aluminum conductors are not acceptable.

D. Insulation: Provide THHN/THWN insulation for all conductors size 500 kcmil and larger, and No. 8 AWG and smaller. For all other sizes provide THW, THHN/THWN or XHHW insulation as appropriate for the locations where installed. Type THHN insulation may be used for branch circuit and feeder sizes for 100 amp under. Adjust conduit size.

E. Color coding for phase identification in accordance with Section 26 05 00 –Electrical, General.

F. VFD Cables: Provide VFD cable for all VFD applications.

1. Cable shall contain all phase conductors plus ground.

2. Contain a braided shield with 85% coverage and foil shield with 100% coverage.

3. Insulation to be XLPE.

4. For retrofit applications where conduit fill is limited, modifications to the above

5. For retrofit applications where conduit fill is limited, modifications to the above requirements to reduce cable size may be required. Submit product for review and approval by Engineer.

2.3 CONNECTORS FOR CONDUCTORS

A. Provide UL-listed factory-fabricated, solderless metal connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated. Use connectors with temperature ratings equal to or greater than those of the wires upon which used.

PART 3 - EXECUTION

3.1 WIRING METHOD

A. Use the following wiring methods as indicated:

1. Wire: Install all wire in raceway, minimum size for light and power circuits shall be #12 AWG. Minimum size for control wire shall be 14 AWG.

3.2 INSTALLATION OF WIRES AND CABLES

A. General: Install electrical cables, wires, and connectors in compliance with NEC.

B. Pull conductors simultaneously where more than one is being installed in same raceway. Use UL listed pulling compound or lubricant, where necessary.

C. Install splice and tap connectors which possess equivalent or better mechanical strength and insulation rating than conductors being spliced. No joints or taps permitted in service or feeder circuits.

D. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.

E. Install VFD cables per VFD manufacturer requirements. VFD cable shielding must be connected at both the drive and the motor ends unless the drive manufacturer provided different guidelines. The shielding must be connected at a 360° contact.

3.3 FIELD QUALITY CONTROL

A. Prior to energizing, test wires and cables for electrical continuity and for short-circuits.

END OF SECTION 26 05 19

SECTION 26 29 13.13 - ACROSS-THE-LINE-MOTOR CONTROLLERS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes A.C. motor control devices rated 600 V and below that are not supplied as an integral part of a motor control center.

B. Related Sections include the following:

1. Section 26 05 00 – Electrical, General for general materials, installation methods, and labeling.

1.2 SUBMITTALS

A. Product data for products specified in this Section. Include dimensions, ratings, and data on features and components.

B. Maintenance Data: For products to include in the maintenance manuals specified in Division 1.

C. Load Current and Overload Relay Heater List: Compile after motors have been installed and arrange to demonstrate that selection of heaters suits actual motor nameplate full-load currents.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain similar motor-control devices through one source from a single manufacturer.

B. Comply with NFPA 70, UL, and NEMA.

C. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The Terms "Listed and Labeled": As defined in the National Electrical Code, Article 100.

1.4 COORDINATION

A. Coordinate features of controllers and control devices with pilot devices and control circuits.

1.5 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

1. Spare Fuses and Incandescent Indicating Lamps: Furnish 1 spare for every 5 installed units, but not less than 1 set of 3 of each kind.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Eaton

2. Allen-Bradley Co.; Industrial Control Group.

3. General Electric Co.; Electrical Distribution & Control Div.

4. Square D Co.

2.2 MAGNETIC MOTOR CONTROLLERS

A. Description: NEMA ICS 2, Class A, full voltage, nonreversing, across the line, unless otherwise indicated.

B. Control Circuit: 120 V. Provide control power transformer integral with controller where no other supply of 120 V control power to controller is indicated. Provide control power transformer with adequate capacity to operate connected pilot, indicating and control devices, plus 100 percent spare capacity.

C. Combination Controller: Factory assembled with controller and arranged to disconnect switch with or without overcurrent protection as indicated.

1. Fusible Disconnecting Means: NEMA KS 1, heavy-duty, fusible switch with rejection-type fuse clips rated for fuses. Select and size fuses to provide Type 2 protection according to IEC 947-4-1, as certified by a nationally recognized testing laboratory.

D. Overload Relay: NEMA ICS 2, Class 10 tripping characteristics selected to protect motor against voltage unbalance and single phasing. Revise controller specifications to suit Project. Autotransformer Reduced-Voltage Controller: NEMA ICS 2, closed transition.

2.3 ENCLOSURES

A. Description: Flush or surface mounted cabinets as indicated. NEMA 250, Type 12, unless otherwise indicated to comply with environmental conditions at installed location.

1. Outdoor Locations: NEMA 250, Type 3R.

2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

3. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

2.4 ACCESSORIES

A. Devices shall be factory installed in controller enclosure, unless otherwise indicated.

B. Push-Button Stations, Pilot Lights, and Selector Switches: NEMA ICS 2, heavy-duty type.

C. Stop and Lockout Push-Button Station: Momentary-break, push-button station with a factory-applied hasp arranged so padlock can be used to lock push button in depressed position with control circuit open.

D. Control Relays: Auxiliary and adjustable time-delay relays.

PART 3 - EXECUTION

3.1 APPLICATION

A. Select features of each enclosed controller to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; duty cycle of motor, drive, and load; and configuration of pilot device and control circuit affecting controller functions.

B. Select horsepower rating of controllers to suit motor controlled.

C. Pushbutton Stations: In covers of magnetic controllers for manually started motors where indicated, start contact connected in parallel with sealing auxiliary contact for low-voltage protection.

D. Hand-Off-Automatic Selector Switches: In covers of manual and magnetic controllers of motors started and stopped by automatic controls or interlocks with other equipment.

3.2 INSTALLATION

A. Install independently mounted motor-control devices according to manufacturer's written instructions.

B. Location: Locate controllers within sight of motors controlled, unless otherwise indicated.

C. For control equipment at walls, bolt units to wall or mount on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks .

D. Install freestanding equipment on concrete housekeeping bases conforming to Section 26 05 00 – Electrical, General.

E. Motor-Controller Fuses: Install indicated fuses in each fusible switch.

3.3 IDENTIFICATION

A. Identify motor control components and control wiring in accordance with Section 26 05 00 – Electrical, General.

3.4 CONTROL WIRING INSTALLATION

A. Bundle, train, and support wiring in enclosures.

B. Connect hand-off-automatic switch and other automatic control devices where available.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.5, 7.6, and 7.16. Certify compliance with test parameters.

2. Remove and replace malfunctioning units with new units, and retest.

3.5 CONNECTIONS

A. Tighten connectors, terminals, bus joints, and mountings. Tighten field connected connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, comply with tightening torques specified in UL 486A and UL 486B.

3.6 FIELD QUALITY CONTROL

A. Testing: After installing motor controllers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NeTA ATS, Sections 7.5, 7.6, and 7.16. Certify compliance with test parameters.

2. Remove and replace malfunctioning units with new units, and retest.

3.7 CLEANING

A. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean devices internally using methods and materials as recommended by manufacturer.

END OF SECTION 26 29 13.13

SECTION 40 05 93 – COMMON MOTOR REQUIREMENTS FOR PROCESS EQUIPMENT

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The Vendor shall provide electrical motors, accessories, and appurtenances complete and operable, in conformance with the individual driven equipment specifications and the Contract Documents.

B. The provision in this Section apply to all low voltage AC squirrel cage induction motors except as indicated otherwise.

C. All motors shown on the Drawings or specified in other divisions of the specifications shall in general, be furnished with the driven equipment and connected under Division 26 of the Specification.

D. If motors are specified in other divisions of the Specification, then in the event of conflicts, the more restrictive specification shall apply.

E. The Vendor shall select suitable electric motors for the equipment. The choice of motor manufacturer shall be subject to review by the Engineer. Such review will consider future availability of replacement parts and compatibility with driven equipment.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Motors shall be designed, built, and tested in accordance with the latest revision of the following standard documents. In the case of conflict between the requirements of this Section and those of the standard documents, the requirements of this Section shall prevail.

1.	NEMA MG 1	Motors and Generators
2.	ANSI/IEEE 112	Test Procedures for Polyphase Induction Motors and Generators
3.	UL l004	Motors, Electric

1.3 VENDOR SUBMITTALS

A. Refer to Section 01 30 00 – Vendor Submittals and individual equipment specification requirements.

B. Submit the motor manufacturer's certification of bearing life on motors where application conditions suggest significant belt drive or thrust loads.

C. Motor outline, dimensions, and weight.

D. Manufacturer's descriptive information relative to specified features.

E. Motor Performance Characteristics:

1. Guaranteed minimum efficiency at rated load at rated voltage.
2. Guaranteed minimum power factor at rated load at rated voltage.
3. Expected efficiency at 1/2, 3/4, and full load at rated voltage.
4. Expected power factor at 1/2, 3/4, and full load at rated voltage.
5. Motor no-load current at rated voltage.
6. Full load current at rated voltage.
7. Full load current at 110 percent voltage.
8. Starting current at rated voltage.
9. Full load speed.
10. Certified copy of test report for identical motor tested in accordance with NEMA MG 1-12.53a and IEEE Standard 112, Test Method B, showing full load efficiency and power factor not less than specified value. Motors not as specified will be rejected.

F. Operation and Maintenance Manuals (provided before or during training of treatment plant staff), including:

1. Complete information for storage and installation.
2. Complete operating and maintenance instructions.
3. Bill of Materials.

1.4 EQUIPMENT GUARANTEE

A. Guarantees shall cover:

1. Faulty or inadequate design.
2. Improper assembly or erection.
3. Breakage, or other failure.
4. Defective workmanship or materials

1.5 FACTORY TESTS

A. Provide factory test and test reports as listed below for all polyphase motors. For motors 7 1/2 hp and above, provide test reports for the actual motor being supplied. For motors under 7 1/2 hp, test reports of an identical motor may be provided. Perform all tests in accordance with the Procedures for Polyphase Induction Motors and Generators No. 112A and NEMA MG 1.

B. Measurements of no-load current and speed at nominal voltage and frequency

1. Measurement of locked rotor current at rated frequency.

2. Results of high-potential test.

3. Determination of efficiency and power factor at 1/2 load, 3/4 load, full-load, and service factor load.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide squirrel-cage induction motors unless otherwise noted.

B. Coordination: Provide motors especially suitable both electrically and mechanically to drive the loads specified. The speed, horsepower, torque base, bearing, shaft, insulation and enclosure shall be closely coordinated with this specification so as to provide a satisfactory, efficient drive without overloading, overheating, abnormal noise or vibration. The BHP required of the driven equipment under the most severe operating conditions for the equipment served shall not exceed the rated nameplate horsepower of the motor when operating at its rated service factor, nor shall it exceed the rated nameplate horsepower of the motor when operated at specified conditions at a service factor of 1.0. The "most severe operating conditions" shall include the full possible range of normal operating conditions but shall not include unusual conditions such as equipment failure.

C. Standards: All motors shall be in accordance with NEMA-MG 1 "T" Line, IEEE and ANSI latest revision insofar as they are applicable.

D. Service Conditions: Provide motors designed and built for long, trouble-free life in industrial service capable of operating successfully under the following application conditions:

1. 40°C maximum ambient temperature to -20 degrees Celsius minimum ambient temperature.

2. Altitude at the facility site shall be verified.

3. Voltage variations to + 10 percent of nameplate rating.

4. Frequency variations to + 5 percent of nameplate rating.

5. Hazardous classification of Class 1 Division 1

E. Operating Characteristics: All motors shall be rated for full-voltage starting, NEMA Design B, normal torque, normal starting current, unless otherwise required by the driven equipment or specified.

F. Installation Environment: Provide motors suitable for the environment in which they are to be installed. Where the installation environment is specified, provide motors suitable for the environment indicated and in conformance with the specification.

2.2 ENCLOSURES

A. Horizontal: Drip proof NEMA Standard MG 1, unless otherwise specified. Provide screen over all air openings.

B. TEFC and TENV: Totally enclosed fan cooled (TEFC) where specified. Provide horizontal TEFC motors with condensate drain holes. Totally enclosed non- ventilated (TENV) may be substituted for TEFC at Vendor's option.

C. Cast iron or extruded aluminum or die cast aluminum stator frames and end shields, rigid construction.

D. Hazardous locations: Enclosure shall meet the requirements for the location in which it is installed.

2.3 ACCESSORY REQUIREMENTS

A. Motor Assembly: Provide NEMA conduit entrance box. Provide conduit entrance box size and drilling to conform to the conduit or wiring requirements indicated on the electrical drawings. Include motor leads and all accessory leads in a common conduit entrance box.

B. Motor Leads: Provide motor leads compatible with motor insulation systems, permanently identified.

C. Eyebolts: Provide drilling and tapping for eyebolts on all motors weighing more than 83 pounds.

D. Nameplates: Provide one or more engraved stainless steel stamped metal nameplates with the information required by NEMA-MGI-IO.38 and the following additional information:

1. Maximum ambient temperature for which motor is rated.
2. Class of insulation.
3. Service factor.
4. Bearing number.
5. Motor connection diagram if more than three leads.
6. Power rating in KW if driven equipment ratings are given in metric units.

E. Oil Lubricated Polyphase Motors: Provide lubricating oil reservoirs and sight gauges.

F. Painting: As specified in Section 43 05 01 – Equipment General Provisions.

G. Provide motor grounding lug suitable to terminate ground wire, sized as indicated.

2.4 INSULATION CLASS

A. Provide NEMA Class B insulation for all polyphase squirrel-cage induction motors, unless otherwise specified.

1. Provide additional anti-abrasion protection for non-enclosed motors, per NEMA MGl-l.27.

2. Provide additional moisture protection for enclosed motors, per NEMA MGl-20.48a.

B. Class F insulation with additional nonhygroscopic moisture protection as specified in paragraph 2.03A above may be utilized at the Vendor's option, however, the temperature rise as measured by resistance when operating at rated service factor and load shall conform to the limiting observable temperatures in NEMA-MGl, for class of insulation used.

C. Class A insulating materials shall not be utilized except in single-phase fractional horsepower motors or used in dry locations, with a standard reduction in rated temperature rise.

D. Encapsulation: Where specified. Provide insulating resin encapsulation by a molded or equivalent process in which the resin completely surrounds the conductors in the slots and end turns, leaving no voids between the conductors or adjacent stator steel. Allowable temperature rise shall not exceed the limits of NEMA-MGl.

2.5 SERVICE FACTOR

A. Provide the service factor indicated, or NEMA standard for the specified insulation and enclosure, whichever is greater. Minimum service factor shall be 1.15.

2.6 NEMA TYPE

A. Provide motors in accordance with standard NEMA type classifications as specified. The use of industry standard subclassifications such as "mill and Chemical" motors and similar" standard" heavy-duty designs are encouraged where they meet or exceed the specified minimum requirements.

2.7 POWER RATINGS

A. Motor horsepower or kw ratings, if indicated in the detailed equipment specifications, are minimum size acceptable.

B. Ratings indicated on the electrical drawings are for guidance only and do not limit the equipment size.

C. Frame/hp relationships shall conform to the latest NEMA standards for "T" or "U" frames and all dimensions shall meet NEMA standards.

2.8 STANDARD RATED VOLTAGE PHASE AND FREQUENCY

A. Provide motors nameplate-rated for 60 Hertz power supply as follows unless otherwise specified or shown on the drawings:

1. Motors 1 hp and greater, three phase, 460 volts.

B. Conform to the specified service conditions and the equipment specifications without reduction in the service factor.

2.9 BEARINGS AND SHAFTS

A. Motors greater than 2 HP shall have bearings designed for 17,500 hours (belted) or 100,000 hours (coupled) L-10 life.

B. Fractional Horsepower: Motors with fractional horsepower through 2 HP shall be provided with Lubricated-for-Life ball bearings.

C. Shafts: Shafts shall be in accordance with NEMA "T" or "TS" dimensions. Long shafts shall be suitable for belt, chain or gear drive within limits established by good industrial practice and documented by NEMA. Short shafts shall be used for direct connection. Vertical motors shall be the solid-shaft type except where application requires a hollow-shaft design.

2.10 DUTY CYCLE

A. Provide motors rated for continuous duty unless otherwise specified. Short time rated motors may be provided where the application is well documented by NEMA, is usual industrial practice and the driven equipment and motor is a tested combination under the specified performance conditions.

2.11 LUBRICATION

A. Horizontal polyphase motors shall be grease lubricated. The bearing housing shall be large enough to hold sufficient lubricant to minimize the need for frequent relubrication, but facilities shall be provided for adding new grease and draining out old grease without major motor disassembly. Motors 180T frame and smaller may utilize grease release fitting in lieu of grease drain plug. The bearing housing shall have long, tight, running fits or rotating seals to protect against the entrance of foreign matter into the bearings or leakage of grease out of the bearing cavity.

2.12 HIGH EFFICIENCY MOTORS

A. All motors provided shall be high efficiency as specified below.

B. High efficiency motors shall have minimum and nominal efficiencies which meet or exceed the efficiencies specified below when tested in accordance with the latest version of IEEE Test Procedure 112A. Method B. using accuracy improvement by segregated loss determination including stray load loss improvement as specified in NEMA Standard MGl-12.S3A. latest revision. Minimum efficiencies shall be guaranteed in writing.

2.13 ACCEPTABLE MANUFACTURER

A. U.S. Motors

B. General Electric

C. Equal

PART 3 - EXECUTION

3.1 ERECTION

A. Motors shall be factory installed on common bases, stands, etc., with the driven equipment. Provide suitable couplings and guards between motor and driven equipment.

B. Align and connect to driven equipment.

END OF SECTION 40 05 93

SECTION 40 61 96 - CONTROL STRATEGIES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The following equipment is included in the control strategies:

1. Influent fine screening

1.2 ABBREVIATIONS

A. The following abbreviations are used in this Section:

F/R:	Forward or Reverse
HOR:	HAND/OFF/REMOTE
VFD:	Variable Frequency Drive
HOA:	Hand/Off/Auto
MOV:	Motor Operated Valve
LCP:	Local Control Panel
LCS:	Local Control Station
PLC:	Programmable Logic Controller

1.3 SUBMITTALS

A. Provide submittals in accordance with Sections 01 30 00 – Vendor Submittals.

B. Develop detailed loop descriptions based on the information in the Contract Documents, including the Process and Instrumentation drawings (P&ID) and Division 40 specifications.

1. For each control loop, provide a detailed functional description of the operation of the equipment, signals, and controls shown on the P&IDs:

a. Include all functions depicted or described in the Contract Documents.

b. Include the following within each loop description:

1) All requirements specific to that loop.

2) Common control requirements applicable to that loop.

3) List of all ranges, setpoints, timers, values, counters, etc.

c. Where there are similar loops with identical control, only 1 loop description needs be developed and the remaining loops may reference that loop description.

C. Loop description format:

1. Loop number and title.

2. References:

a. List P&IDs that are specifically referenced.

3. Abstract:

a. General description of how the loop works, what devices are involved, and how the process shall be controlled.

b. Process values, setpoints, and limits, including units and ranges:

1) Show span and range values for analog inputs and outputs, and operating point and dead band for discrete inputs.

4. Hardwired control:

a. Detailed description of the control functions at the local level.

b. Function of local operator interfaces.

c. Operation of hardwired field pilot controls:

1) Pushbuttons.

2) Selector switches.

3) Potentiometers.

4) Pilot lights, indicators, and other displays.

5. Hardwired interlocks:

a. Explanation of the operation of system interlocks and hardwired permissive conditions.

6. PLC control:

a. Detailed description of the control functions that are under control of the PLC.

b. Operator controls and automatic controls.

c. Setpoints, alarms, etc.:

1) Include units and ranges for analog values.

2) Include span and range for analog inputs and outputs.

3) Include operating point and dead band for discrete inputs, and identify conditions where contacts are open, and when they close.

d. Control sequences.

7. Software interlocks:

   a. Operation of system software interlocks.

8. HMI/HIM control:

   a. Detailed description of the operator controls.

9. SCADA control:

   a. Detailed description of the operator controls.

   b. Setpoints, alarms, etc.

10. Indicators and alarms:

   a. List any indicators and alarms specific to the loop that are not covered in the common control strategies.

11. Failure modes:

   a. List any failure modes specific to the loop that are not covered in the common control strategies.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.1 COMMON FUNCTIONS

A. Common functions that are generally applicable to all loops or to many similar loops are described under the heading "General Control Loop Functions." These functions are not repeated in the descriptions for each individual control strategy.

B. General Control Loop Functions: The following general control system functions shall be provided:

1. All analog and discrete inputs to the dialers shall be displayed. Both RUNNING and OFF input states shall be displayed.

2. All analog inputs shall have instrument failure alarms when the input is below 0 percent or above 100 percent for a tunable time initially set at 10 seconds.

3. All discrete FAIL inputs shall be alarmed for a tunable time initially set at 10 seconds. Other discrete inputs shall be alarmed as noted in the control strategy descriptions.

4. Operational Readiness Testing (ORT) should include all discrete and analog alarms as well as status alarms. This should also include all operations (e.g. lift station pump controls for lead, lag alarms, etc.). All alarm should be tested through voice or text notification as needed.

5. Where alarms are specified in the control strategy descriptions or on the Drawings, alarms shall be initiated from the applicable inputs. If discrete inputs are not available, the specified alarms shall be initiated from the applicable analog input; alarm set-points shall be operator adjustable.

6. All flow inputs and equipment run times shall be totalized and recorded. All totalized values shall be displayed. Runtime shall be displayed in tenths of an hour and be based on real-time accumulation.

7. When a level is less than 10 (e.g. ft, psi, mg/L, etc.) the precision shall be recorded in hundredths.

8. Displays shall be grouped functionally for ease of operation. Both analog and discrete functions associated with an item of equipment or a group of equipment shall be provided on the same display.

9. All PID control functions shall be provided with standard analog controller functions and operator interfaces including, but not limited to, the following:

    a. AUTO/MANUAL mode selection: In AUTO, the output of controller shall be based on the PID control calculation. In MANUAL, the output of the controller shall be constant, but operator adjustable. Transfer between operational modes shall be bumpless.

    b. OPERATOR/PROGRAM set point selection: In OPERATOR, the set point shall be operator adjustable from the equipment. In PROGRAM, the set point shall be adjusted by the associated PLC.

    c. Set point, process variable, and controller output shall be displayed.

    d. Provisions shall be included to prevent reset windup.

10. When equipment is tagged OUT OF SERVICE, by the operator all associated equipment shall have their alarms inhibited until the tagged equipment is re-tagged IN SERVICE.

11. Speed indications and speed control set-points shall be displayed in Hz.

12. Wherever two or more pieces of equipment are provided for the same functions, the equipment shall be alternated after each use.

13. All motorized equipment with status contact indication in SCADA shall have:

    a. Totalized elapsed time (non-resetting)

    b. Totalized elapsed time (24-hour). Midnight reset, store and log previous day.

14. All VFD controlled equipment shall be configured for Ethernet control and monitoring by the associated PLC. SCADA display shall include, but not be limited to, the following:

    a. VFD Running Status

    b. VFD Fault

    c. VFD Speed Output (%)

    d. VFD Speed Feedback (%)

    e. Motor KW

    f. Motor Amps

3.2 INFLUENT FINE SCREENING

A. Reference Section 46 21 35 – Rotary Drum Fine Screen.

B. Description: The screening area in the Headworks is comprised of two screening channels with various manual isolation gates/stop plates. In the new fine screen, the screenings are washed, compacted, and then discharged to a dumpster. The screen has a level detection system using the water level to signal the new fine screen to run. The screen control panel is located in the electrical building near the Headworks. Adjacent to each screen is a remote panel including an emergency stop push button.

C. Local Manual Control Mode: When HAND mode is selected, the screen will run in the appropriate direction determined by the forward or reverse selector switch. When in HAND, the spray wash button activates the wash solenoid.

D. Automatic Control Mode: When the HOA selector switch is in the AUTO position, the fine screen unit will be energized based upon one of the options as follows:

1. The fine screen is equipped with a level setting accessible for adjustment, and a detection system to determine the need for screen operation based upon the upstream channel fluid levels compared to this setting. When the LEVEL/TIME (in SCADA) is in the LEVEL position, the unit will be energized when the level exceeds the operator setpoint. The cleaning cycle will run for an operator adjustable period of time.

2. The fine screen is equipped with a timer (30 seconds to 15 minutes) that is accessible for adjustment from the front of the LCP enclosure. The operator may set the timer as desired. When the LEVEL/TIME (in SCADA) is in the TIME position, the cycle timer will count down and the unit will be energized to when the cycle timer expires or when the upstream level exceeds the operator setpoint. The unit will continue to run for the operator adjusted time period. After each run cycle, the cycle timer is automatically reset and repeats the countdown cycle once again.

3. All automatic control mode functions and setpoints are accessible from the SCADA system.

E. Interlocks: The following interlocks and/or permissives shall be provided in addition to the standard motor protection by overload detection:

1. As provided by the manufacturer of the screening equipment, an output signal from the screen is used to START/STOP the internal dewatering press.

F. SCADA Indicators:

1. Fine Screen:

a. Screens Status (on = green).

b. HOA selector switches AUTO position status.

c. High level.

d. Fail.

e. E-stop.

f. Elapsed run time for screen in tenths of an hour.

G. SCADA Control:

1. Fine Screen:

a. Auto

H. SCADA Alarms: As a minimum, the following alarms shall be provided to the SCADA system:

1. Fault alarm for the screen.

2. High level for the screens.

END OF SECTION 40 61 96

SECTION 40 67 00 - CONTROL PANELS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Vendor shall provide control panels, complete and operable, in accordance with the Contract Documents.

B. The provisions of this Section apply to local panels provided in equipment systems specified in other sections unless indicated otherwise in those sections.

1.2 REFERENCE STANDARDS

A.	ASTM A 283	Low and Intermediate Tensile Strength Carbon Steel Plates
B.	UL 508A	Industrial Control Panels

1.3 SUBMITTALS

A. Submittals shall be furnished in accordance with Section 01 30 00 – Vendor Submittals.

B. Shop Drawings: The Vendor shall submit shop drawings for each panel and enclosure provided under Division 40. The shop drawings shall completely define and document the construction, finish, layout, power circuits, signal and safety grounding circuits, fuses, circuit breakers, signal circuits, internally mounted instrumentation, face plate mounted instrumentation components, internal panel arrangements, and external panel arrangements. The submittal shall include the following:

1. A complete index shall appear in the front of each bound volume. Drawings and data sheets associated with a panel shall be grouped together with the panels being indexed by systems or process areas. Panel tagging and nameplate nomenclature shall be consistent with the requirements of the Contract Documents.

2. Scaled physical arrangement drawings drawn to scale that define and quantify the physical groupings comprising control panel sections, auxiliary panels, subpanels, and racks. Cutout locations with nameplate identifications shall be shown.

3. Front of panel layouts for all control panels.

4. Schematic/elementary diagrams shall depict all control devices and circuits and their functions.

5. Wiring/connection diagrams shall locate and identify electrical devices, terminals, and interconnecting wiring. These diagrams shall show interconnecting wiring by lines, designate terminal assignments, and show the physical location of all electrical and control devices.

6. Interconnection diagrams shall locate and identify all external connections between the control panel/control panel devices and associated equipment. These diagrams shall show interconnecting wiring by lines, designate terminal assignments, and show the physical location of all panel ingress and egress points.

7. A bill of material that enumerates all devices associated with the control panel.

8. Final panel drawings to be included in Operations and Maintenance Manual shall include all redlines.

PART 2 - PRODUCTS

2.1 GENERAL

A. Environmental Suitability: Indoor and outdoor control panels and instrument enclosures shall be suitable for operation in the ambient conditions associated with the locations designated in the Contract Documents. Heating, cooling, and dehumidifying devices shall be provided in order to maintain all instrumentation devices within 20 percent of the minimums and maximums of their rated environmental operating ranges. The Installation Contractor shall provide all power wiring for these devices, equipment Vendor is responsible for providing a single point connection. Instrumentation in hazardous areas shall be suitable for use in the particular hazardous or classified location in which it is to be installed.

B. The control panel controls shall be 120 VAC. Where the electrical power supply to the control panel is 480 VAC 3-phase, the control panel shall be provided with a control panel transformer. Control conductors shall be provided in accordance with the indicated requirements.

C. The control panel shall be the source of power for any 120 VAC solenoid valves interconnected with the control panel. Equipment associated with the control panel shall be ready for service after connection of conductors to equipment, controls, and control panel.

D. The main feeder disconnect shall have a door-mounted handle unless otherwise indicated.

E. Unless indicated otherwise, control panels shall be housed in NEMA rated enclosures in accordance with Section 26 05 00 – Electrical, General. Panels shall be either freestanding, pedestal-mounted or equipment skid-mounted, as indicated. Internal control components shall be mounted on an internal back-panel or side-panel as required.

F. Each source of foreign voltage shall be isolated by providing disconnecting or pull-apart terminal blocks or a disconnect operable from the control panel front. Each control panel shall be provided with identified terminal strips for the connection of all external conductors. The Contractor shall provide sufficient terminal blocks to connect 25 percent additional conductors for future use.

G. Motor starters, where required, shall be in accordance with Section 26 29 13.13 – Across-the-Line Motor Controllers. Each motor starter shall be provided with contact closures for motor overload, local indication, and remote alarm. Electrical components shall be of standard American manufacture.

H. Discrete outputs from the control panel shall be provided by electrically isolated contacts rated for 5 amps at 120 VAC. Analog inputs and outputs shall be isolated 4-20 mA, 2-wire signals with power supply.

I. Control panel mounted devices shall be mounted a minimum of 3 feet above finished floor elevation.

2.2 CONTROL PANELS

A. Each PLC and remote I/O system and corresponding housing, including I/O modules, power supply modules, communication interface devices, and peripheral equipment shall be mounted inside a NEMA enclosure in accordance with Section 26 05 00 – Electrical, General. I/O wiring from the field to the remote I/O system shall be terminated on terminal blocks in the lower portion of the enclosure.

B. Materials: Panel section faces shall be No. 10 gauge minimum thickness for free standing panels and No. 14 gauge minimum thickness for wall mounted or pedestal mounted panels. Materials shall be selected for levelness and smoothness.

1. Relay rack high density type panels shall utilize standard relay racks with No. 14 gauge steel frame and supports.

2. Structural shapes and strap steel shall comply with ASTM A 283 - Low and Intermediate Tensile Strength Carbon Steel Plates, Grade C.

3. Bolting Material: Commercial quality carbon steel bolts, nuts, and washers shall be 1/2-inch diameter with UNC threads. Carriage bolts shall be used for attaching end plates. All other bolts shall be hex end machine bolts. Nuts shall be hot pressed hex, American Standard, heavy. Standard wrought washers shall be used for foundation bolts and attachments to building structures. Other bolted joints shall have SAE standard lock washers.

C. Construction: Dimensions shall be in accordance with vendor's requirements. Elevations and horizontal spacing shall be subject to Engineer's approval.

D. Fabrication: End plates, top plates, and top closure panels (to hung ceiling) shall be provided when required by the material requisition. End plates, top plates, and top closure panels shall be removable with countersunk bolts to match panels. Top closure panels shall be furnished in lengths which match the widths of standard panels, except that one top closure panel may extend across two 4-foot 6-inch wide or five 2-foot wide standard panels. The vertical joints of these panels shall align with the vertical joints of the standard panels.

1. End closure or rear closure doors shall be provided where required. Such doors shall be flush fitting, gasketed, and be of the hinged lift-off type with lockable door handles. A common key shall be provided for all doors on one panel assembly. Removable access panels shall be provided with dished handle fasteners. Screw driver 1/4 turn or Dzus type fasteners are not acceptable.

2. The flanged edges of all panels shall be straight and smooth. Corners shall be welded and ground smooth.

3. The face of the panel shall be true and level after angling.

4. All panel cutouts and holes may be cut or drilled by any standard method that does not cause deformation. Burrs shall be ground smooth.

5. Adjacent panels shall assemble with races flush. Gaps or cracks shall not be visible from the front of the assembled instrument board.

6. Stiffeners shall be welded to the back of panels, as required to prevent panel deformation due to the weight of face mounted instruments.

7. Panels shall be self-supporting as defined below.

E. Preparation of Panel Surface: The following requirements apply to the front and rear face of the panel, both sides and the edges of all flanges, and the periphery of all holes or cutouts.

1. High spots, burrs, and rough spots shall be ground smooth.

2. The surfaces shall be sanded or sandblasted to a smooth, clean, bright finish.

3. All traces of oil shall be removed with a solvent.

4. The first coat of primer shall be applied immediately.

F. Instrument Finishing: The final coats applied to painted surface of instrument cases, doors, or bezels which are visible from the front of panels shall be manufacturer's standard unless otherwise indicated. Black Japan or "crinkle" finishes on instrument cases are not acceptable.

G. Mounting of Instruments: The panel vendor shall provide cutouts, and shall mount all instrument items indicated to be panel mounted, including any instruments indicated to be furnished by other vendors but installed in the panel.

1. The panel vendor shall also mount behind the panels other instrument accessory items as required for functionality as indicated.

2. Equipment mounted at the rear of panel shall be installed to allow for commissioning adjustments, servicing requirements, and cover removal.

3. Spare space shall be kept clear of wiring, etc., to give maximum space for future additions.

H. Electrical Requirements:

1. All conduit, wireways, switches, wire, and electrical fittings for 120-volt circuits to instruments and other electrical devices as required for a complete and operable installation.

2. Conduit, wireways, junction boxes and fittings shall be provided for signal wire, thermocouple, or resistance thermometer lead wire. Conduit or wireway runs shall include those required between temperature sensors and temperature transmitters and between the thermocouple wireway or junction box and instruments.

3. Each terminal connection shall have a plastic plate with a terminal and instrument tag number. Wiring shall be identified with stamped tubular wire end markers.

4. Panels shall be provided with a 15 amp, 120 volt, service outlet circuit within the back-of-panel area.

5. Wall mounted or pedestal mounted panels shall be so sized as to adequately - dissipate heat generated by equipment mounted in or on the panel.

6. Wiring Methods: Wiring methods and materials for all panels shall be in accordance with the NEC requirements for General Purpose (no open wiring) unless otherwise indicated. Control Panels shall be UL508A listed Control Panels.

7. Signal and Control Circuit Wiring: Wire type and sizes: Conductor shall be flexible stranded copper machine tool wire, UL listed Type MTW, and shall be rated 600 volts. Wires for instrument signal circuits and alarm input circuits shall be No. 14 AWG. All other wires, including shielded cables, shall be No. 18 AWG minimum.

    a. Wire Insulation Colors: Ungrounded control circuit conductors operating at the supply voltage shall have a black insulation. Grounded circuit conductors shall have white insulation. Insulation for ungrounded AC control circuit conductors operating at less than the supply voltage shall be red. Wires energized by a voltage source external to the control panel shall have yellow insulation. Insulation for ungrounded DC conductors shall be blue. Insulation for grounded DC conductors shall be white with blue stripe.

    b. Wire Marking: Wire numbers shall be marked using white numbered wire markers made from plastic-coated cloth, Brady Type B 500 or equal, or shall be heat shrink plastic.

    c. For case grounding, panels shall be provided with a 1/4-inch by 1-inch copper ground bus complete with soderless connector for one No.4 AWG bare stranded copper cable.

8. Electrical Locations: Single case (no remote logic) annunciator units shall be installed at the top of panel and may be considered as a terminal box when top of panel wire entry is indicated, If bottom of panel entry is indicated, a terminal box shall be provided at the bottom of the panel and be wired to the annunciator unit. Terminals shall be identified with plastic marker strips.

    a. Terminal boxes for incoming and outgoing signal leads shall be located at the top or bottom of the panel as indicated in the material specification, or as for otherwise required.

9. Power Supply Wiring: Unless otherwise indicated, instruments, alarm systems, and motor controls shall operate on 120 volt, 60 Hz circuits. At a location near the top of the panel (or bottom), the panel fabricator shall provide terminal box connections for the main power supply entry.

    a. Power supply switches for alarm units shall be 3 pole type, arranged to open both power circuits and alarm circuits. Each annunciator unit shall be equipped with a separate switch.

b. Instruments located on the same panel section and serving the same process unit may be connected to a common branch circuit from the power supply. The number of circuits depends on the circuit load as noted herein. A 15 amp, 2 pole circuit breaker shall be provided in each branch circuit. The circuit load units must not use common branch circuits. When instruments do not come equipped with integral fuses, provide fuses as required for the protection of individual instruments against fault currents. Fuses shall be mounted on the back of the panel in a fuse holder, and each fuse shall be identified by a service name tag. Fuses shall be as manufactured by Bussmann Manufacturing Division, Type or equal.

c. Each potentiometer type instrument, electronic transducer, controller, or analyzer shall have an individual disconnect switch. Disconnect switches shall have metal or plastic tags indicating instrument tag numbers. Individual plug and cord set power supply connections may be used without switches when indicated in the material specification.

d. Where alarm units are single unit types, one switch may be used to disconnect not more than 6 alarm units located on the same or adjacent panels.

10. Alarm Wiring: The panel vendor shall install and wire alarms including light cabinets, audible signal units, test and acknowledge switches, and remote logic units as indicated. Interconnecting wiring to panel mounted initiating devices shall also be wired by the panel vendor. The wiring from external initiating devices shall be provided by the Contractor. Where plug and cord sets are provided for component interconnection, the panel vendor shall harness and support the cables in neat and orderly fashion. Where separate wire is required, panel vendor shall install No. 16 AWG with THWN or THHN insulation between all components.

11. Signal Wiring: Signal wire shall be twisted pair or triads in conduit or troughs Cable shall be constructed of No. 16 AWG copper signal wires with THWN or THHN insulation.

a. Color code for instrument signal wiring shall be as follows:

1) Positive (+) - Black

2) Negative (-) - White

b. Multiconductor cables where indicated shall consist of No. 16 AWG copper signal wires twisted in pairs, with 90-C, 600 V fault insulation. A copper drain wire shall be provided for the bundle with a wrap of aluminum polyester shield. The overall bundle jacket shall be PVC.

I. Labor and Workmanship: Panels shall be fabricated, piped, and wired by fully qualified workmen who are properly trained, experienced, and supervised.

J. At a minimum, control panels shall be constructed in a UL shop and contain UL labels prior to shipment.

2.3 UNINTERRUPTIBLE POWER SUPPLY (UPS)

A. Provide and install UPS(s) to power all PLC hardware furnished under this Specification.

B. The UPS shall receive a 120 VAC, 60 HZ power input, and generate a 120 VAC, 60 HZ output signal which is protected from incoming spikes, sags, noise, brownouts, and power outages.

1. The UPS shall incorporate a transformer, a battery pack, a battery charger, an inverter, and a microprocessor based controller to provide continuous, on-line, computer grade uninterruptible power. Lighting and surge protection shall meet ANSI/IEEE c62.41 categories A and B. The UPS shall be U.L. listed. Spike attenuation shall be 2000 to 1. The output neutral shall be bonded to ground. Noise isolation shall be 120 Db common-mode, 60 Db normal mode. Output voltage regulation shall be + 3% with less than 5% total harmonic distortion. UPS efficiency shall be at least 85%. The UPS shall be rated for ambient temperatures from 32 degrees F to 104 degrees F and relative humidity from 0 to 95%

2. Each UPS shall maintain power to all of its connected loads, including non-constant loads such as alarms and printers, for a minimum of 15 minutes with a 50% growth factor over the connected load. The equipment submittal shall include sizing calculations which support the model and size selected. The UPS shall be supplied with a low output voltage cutoff to prevent damage to loads when the battery power is exhausted.

3. The uninterruptible power supply shall be Best Ferrups UPS series, Liebert, IPM or equal.

C. The equipment shall include sizing calculation which support the unit selected being able to power all its connected loads for the indicated time period with a 50% growth factor.

PART 3 - EXECUTION

3.1 LISTING AND INSTALLATION

A. Control Panels shall be fabricated in accordance with UL 508A, and shall be UL Listed Industrial Control Panels.

3.2 EQUIPMENT DELIVERY

A. Panels shall be crated for shipment using a heavy framework and skids. Panel sections shall be cushioned to protect the finish of the instruments and panel during shipment. Instruments which are shipped with the panel shall further have suitable shipping stops and cushioning material installed to protect parts which could be damaged due to mechanical shock. Each separate panel unit shall be provided with removable lifting lugs to facilitate handling.

B. Shipments by air ride van unless otherwise indicated. Control panel testing and inspection shall be performed prior to shipping.

3.3 CONTROL PANEL SIGNAL AND CONTROL CIRCUIT WIRING

A. Wiring Installation: Wires shall be run in plastic wireways except (1) field wiring, (2) wiring between mating blocks in adjacent sections, (3) wiring from components on a swing out panel to components on a part of the fixed structure, and (4) wiring to panel mounted components. Wiring run from components on a swing out panel to other components on a fixed panel shall be made up in tied bundles. These bundles shall be tied with nylon wire ties and shall be secured to panels at both sides of the "hinge loop" so that conductors are not strained at the terminals.

B. Wiring run to control devices on the front panels shall be tied together at short intervals with nylon wire ties and be secured to the inside face of the panel using adhesive mounts.

C. Wiring to rear terminals on panel-mount instruments shall be in plastic wireways secured to horizontal brackets above or below the instruments in about the same plane as the rear of the instruments.

D. Shop Drawings shall show conformance to the above wiring installation requirements.

E. Wire Marking: Each signal, control, alarm, and indicating circuit conductor connected to a given electrical point shall be designated by a single unique number which shall be shown on Shop Drawings. These numbers shall be marked on conductors at every terminal.

3.4 CALIBRATION, TESTING, AND INSTRUCTION

A. Inspection and Approval: Panel fabricator shall conduct the following tests before shipment.

1. Alarm circuits rung out to determine their operability.

2. Electrical circuits checked for continuity and where applicable, operability.

3. Any other test required to place the panel in an operating condition.

END OF SECTION 40 67 00

SECTION 43 05 01 - EQUIPMENT GENERAL PROVISIONS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The provisions of this Section apply to all sections of Divisions 41 to 43 and Division 46 unless specifically revised therein.

B. Furnish each piece of equipment complete with its base, drives, shafting, couplings, controls, guards, and other appurtenances which are specified or are required for proper and safe operation.

C. Furnish any special tools or equipment required for proper operation maintenance, testing, or adjusting.

1.2 REFERENCE STANDARDS

A. Equipment shall be in accordance with the following standards, as applicable and as indicated in each equipment specification:

1.	AFBMA	Anti-Friction Bearing Manufacturers Association, Inc.
2.	ASTM	American Society for Testing and Materials
3.	ANSI	American National Standards Institute
4.	ASME	American Society of Mechanical Engineers
5.	AWWA	American Water Works Association
6.	ASHREA	American Society of Heating, Refrigerating, and Air Conditioning Engineers
7.	AWS	American Welding Society
8.	NFPA	National Fire Protection Association
9.	NEMA	National Electrical Manufacturers Association
10.	OSHA	General Industry Safety Orders

B. The following standards are referenced in this and other Divisions 41 to 43 and Division 46:

1.	ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800
2.	ANSI B16.5	Pipe Flanges and Flanged Fittings, Steel, Nickel Alloy and other Special Alloys

3.	ANSI B46.1	Surface Texture
4.	ANSI S12.6	Method for the Measurement of the Real-Ear Attenuation of Hearing Protectors
5.	ASME B1.20.1	General Purpose Pipe Threads (Inch)
6.	ASME B31.1	Power Piping
7.	AWWA C206	Field Welding of Steel Water Pipe
8.	AWWA C207	Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144-inches (100 mm through 3,600 mm)
9.	AWWA D100	Welded Steel Tanks for Water Storage
10.	ASTM A48	Gray Iron Castings
11.	ASTM A108	Steel Bars, Carbon, Cold-Finished, Standard Quality
12.	ASME B17.1	Keys and Keyseats
13.	ASME B106.1M	Design of Transmission Shafting

1.3 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 30 00 – Vendor Submittals and the specific equipment specifications sections.

B. Shop Drawings: Furnish complete drawings and technical information for equipment, piping, valves, and controls. Where indicated or required by the Engineer, Shop Drawings shall include clear, concise calculations showing equipment anchorage forces and the capacities of the anchorage elements proposed by the Vendor .

C. Spare Parts List: The Vendor shall submit at the same time as Shop Drawings a list of suggested spare parts for each piece of equipment. Vendor shall also furnish the name, address, and telephone number of the nearest distributor for each piece of equipment.

D. Operation and Maintenance Manual: Provide technical operation and maintenance manuals in accordance with Section 01 78 23 – Operation and Maintenance Data.

1.4 ADAPTATION OF EQUIPMENT

A. The Vendor shall furnish equipment readily adaptable for installation and operation. Equipment furnished shall be compatible with all other equipment furnished under the Contract.

B. The Vendor shall assume full responsibility for all modifications of mechanical and electrical controls, equipment, wiring, piping, as required to accomplish function intended by the Contract Documents.

1.5 QUALITY ASSURANCE

A. Guarantees: Unless otherwise accepted herein, guarantee all equipment and its install required. Guarantees shall cover the following: (1) Faulty or inadequate design; (2) Improper assembly or erection; (3) Leakage, breakage, or other failure; and (4) Defective workmanship or materials.

B. Inspection, Start-up and Field Adjustment: The Vendor shall demonstrate that all equipment meets the specified performance requirements. Vendor shall provide the services of an experienced, competent, and authorized service representative of the manufacturer of each item of major equipment who shall visit the site of Work to perform the following tasks:

1. Assist the Installation Contractor in the installation of the equipment.

2. To inspect, check, adjust if necessary and approve the equipment installation.

3. To start-up and field-test the equipment for proper operation, efficiency, and capacity.

4. To perform necessary field adjustments during the test period until the equipment installation and operation are satisfactory to the Engineer.

5. To instruct the Owner's personnel in the operation and maintenance of the equipment. Instruction shall include step-by-step trouble shooting procedures with all necessary test equipment.

C. Quality and Tolerances: Tolerances and clearances shall be as shown on the Shop Drawings and shall be closely adhered to.

D. Machine Finish: The type of finish shall be the most suitable for the application and shall be shown in micro-inches in accordance with ANSI B46.1

E. Manufacturer's Experience: Equipment manufacturer shall have a record of at least 5 years of successful, trouble free operation in similar applications and size equal or larger than the equipment in this contract.

PART 2 - PRODUCTS

2.1 GENERAL

A. Protection of Equipment: Equipment shall be boxed, crated, or otherwise protected from damages and moisture during shipment, handling, and storage. Equipment shall be protected from exposure to corrosive fumes and shall be kept thoroughly dry at all times. Pumps, motors, drives, electrical equipment, and other equipment having anti-friction or sleeve bearings shall be stored in weather tight storage facilities prior to installation. For extended storage period, plastic equipment wrappers shall be avoided to prevent accumulation of condensate in gears and bearings. In addition, motor space heaters shall be energized, and shafts shall be rotated. Equipment delivered to the Site with rust or corroded parts shall be rejected. If equipment develops defects during storage, it shall be disassembled, cleaned and recoated to restore it to original condition.

B. Identification Equipment Items: At the time of shipping, each item of equipment shall have a legible identifying mark corresponding to the equipment number in the Contract Documents for the particular item.

C. Protective Coating: Equipment shall be painted or coated in accordance with manufacturer recommendations, unless otherwise indicated. Non-ferrous metal and corrosive-resisting steel surfaces shall be coated with grease or lubricating oil. Coated surfaces shall be protected from abrasion or other damage during handling, testing, storing, assembly and shipping.

D. Controls: Equipment and system controls shall be in accordance with Division 26, Division 40, and Division 46.

E. All flanges on equipment and appurtenances provided under this Section shall conform to ANSI B16.1, Class 125; or B16.5, Class 150, unless otherwise shown. All pipe threads shall be in accordance with ANSI/ASME B1.20.1.

F. Nameplates: Equipment nameplates of stainless steel shall be engraved or stamped and fastened to the equipment in an accessible location with No. 4 or larger oval head stainless steel screws or drive pins. Nameplates shall contain the manufacturer's name, model, serial number, size, characteristics, and appropriate date describing the machine performance ratings.

G. Tools: The Vendor shall furnish one complete set of special wrenches and other special tools necessary for the assembly, adjustment, and dismantling of the equipment. Tools shall be of best quality hardened steel forgoing with bright finish. Wrench heads shall have work faces dressed to fit nuts. Tools shall be suitable for professional work and manufactured by Snap On, Crescent, Stanley, or equal. The set of tools shall be neatly mounted in a labeled toolbox of suitable design provided with a hinged cover.

H. Lubricants: The Vendor shall install lubricants for all equipment during storage and prior to initial testing of the equipment. After successful initial testing, final testing, and satisfactory completion startup testing as specified in Section 01 75 16 – Startup Procedures, the Vendor shall conduct one complete lubricant change on all equipment. In addition, the Vendor shall be responsible for the proper disposal of all used lubricants. The Owner will then be responsible for subsequent lubricant changes.

2.2 EQUIPMENT SUPPORTS

A. All pipe connections to equipment shall be supported, anchored and guided to avoid stresses and load on equipment flanges and equipment.

2.3 NOISE REQUIREMENTS

A. Noise Level: When in operation, no single piece of equipment shall exceed the OSHA noise level requirement of 105 dBA for one-hour exposure per day.

2.4 VIBRATION LIMITATIONS

A. Vibration frequencies shall span the range from 5.0 to 5,000 Hz. Where specified, measurements shall be obtained while the installed equipment is operating within the specified speed range.

B. Centrifugal Machines with Sleeve Bearings: Unless otherwise specified, centrifugal machines with sleeve bearing shafts shall not exhibit unfiltered RMS readings for vibration displacement in excess of the following:

Shaft speed range range, rpm	Displacement peak to peak, mils
Up to 900	3.5
901-1800	3.0
1801-3000	2.5
3001-4500	2.0
Above 4500	1.6

Displacement measurements shall be taken radially on the shaft at two points at each bearing. Measuring points shall be 90 degrees apart.

C. Centrifugal Machines with Antifriction Bearings: Unless otherwise specified, centrifugal machines with antifriction bearing shafts shall not exhibit unfiltered RMS readings for vibration velocity in excess of 0.12 inch per second. Velocity measurements shall be taken on one point of each bearing housing.

D. Positive Displacement Machines: Unless otherwise specified, positive displacement machines of the rotary, reciprocating and controlled volume types shall operate without any lateral or torsional vibration characteristics that may accelerate wear of the equipment. The Vendor shall provide manufacturer's certification that the manufacturer has inspected the machine under operating conditions and found it to comply with the manufacturer's requirements.

E. Vibration Isolators: Air compressors, blowers, engines, inline fans shall be provided with restrained spring-type vibration isolators or pads per manufacturer's written recommendations. Vibration isolations shall be provided with seismic restraint.

2.5 CRITICAL SPEED REQUIREMENTS

A. Unless otherwise specified, rotating mechanical equipment shall not exhibit critical speeds within the specified range of operating speeds and impeller blade pass frequencies. Critical speeds for equipment with rigid rotor systems shall be at least 20 percent greater than maximum operating speed and maximum impeller blade pass frequency, whichever is greater. Critical speeds for equipment with flexible shaft-rotor systems shall be at least 15 percent below minimum operating speed and 20 percent above maximum operating speed and blade pass frequency.

2.6 DRIVE TRAINS AND SERVICE FACTORS

A. Drive Trains and Service Factors: Service factors shall be applied in the selection or design of mechanical power transmission components. All components of drive train assemblies between the prime mover and the driven equipment shall be designed and rated to deliver the maximum peak or starting torque, speed, and horsepower. All of the applicable service factors shall be considered, such as mechanical (type of prime mover), load class, start frequency, ventilation, ambient temperature, and fan factors. Drive train components include couplings, shafts, gears, and gear drives, drive chains, sprockets, and V-belt drives. Unless otherwise indicated, the following load classification shall apply in determining service factors:

Type of Equipment	Service Factor	Load Classification
Centrifugal Fans	1.0	Uniform
Pumps		
Centrifugal or Rotary	1.0	Uniform
Reciprocating	1.8	Moderate Shock
Cranes or Hoists	1.25	Moderate Shock

B. Mechanical Service Factors

	Mechanical Service Factors
Uniform	1.25
Moderate Shock	1.50
Heavy Shock	2.0

C. For thermal rating adjustments such as start frequency, ambient temperature, and hourly duty cycle factor, ventilation factor, and fan factor, refer to gear manufacturer sizing information.

D. For service factors of electric motor, see Section 40 05 93 – Common Motor Requirements for Process Equipment.

Where load classifications are not indicated, service factors based on AGMA 514.02 shall be used for standard load classification and for flexible couplings.

2.7 SHAFTING

A. Shafting shall be continuous between bearings and shall be sized to transmit the power required. Keyways shall be accurately cut in line. Shafting shall not be turned down at the ends to accommodate bearings or sprockets whose bore is less than the diameter of the shaft. Shafts shall rotate in the end bearings and shall be turned and polished, straight, and true.

B. Design Criteria: All shafts shall be designed to carry the steady state and transient loads suitable for unlimited number of load applications, in accordance with ASME B 106.1 M - Design of Transmission Shafting. Where shafts are subjected to fatigue stresses, such as frequent start and stop cycles, the mean stress shall be determined by using the modified Goodman Diagram. The maximum torsional stress shall not exceed the endurance limit of the shaft after application of the factor of safety of 2 in the endurance limit and the stress concentration factor of the fillets in the shaft and keyway. Stress concentration factor shall be in accordance with ASME Standard B17.1 - Keys and KeySeats.

C. Materials: Shafting materials shall be appropriate for the type of service and torque transmitted. Environmental elements such as corrosive gases, moisture, and fluids shall be taken into consideration. Materials shall be as indicated unless furnished as part of an equipment assembly.

1. Low carbon cold-rolled steel shafting shall conform to ASTM A 108, Grade 1018.

2. Medium carbon cold-rolled shafting shall conform to ASTM A 108, Grade 1045.

3. Other grades of carbon steel alloys shall be suitable for service and load.

4. Corrosion-resistant shafting shall be stainless steel or Monel, whichever is most suitable for the intended service.

D. Differential Settlement: Where differential settlement between the driver and the driven equipment may occur, a shaft of sufficient length with sets of universal type couplings shall be provided.

2.8 BEARINGS

A. Bearings shall conform to the standards of the Anti-Friction Bearing Manufacturers Association, Inc. (AFBMA).

B. To assure satisfactory bearing application, fitting practice, mounting, lubrication, sealing, static rating, housing strength, and lubrication shall be considered in bearing selection.

C. All re-lubricatable type bearings shall be equipped with an hydraulic grease fitting in an accessible location and shall have sufficient grease capacity in the bearing chamber.

D. All lubricated-for-life bearings shall be factory-lubricated with the manufacturer's recommended grease to insure maximum bearing life and best performance.

E. Anti-Friction Type Bearing Life: Except where otherwise indicated, bearings shall have a minimum 10 life expectancy of 10 years or 20,000 hours, whichever occurs first. Where so indicated, bearings shall have a minimum rated L-10 life expectancy corresponding to the type of service, as follows:

Type of service	Design Life, years	L-10 Design Life, hours
	(Whichever comes first)	
8-hour shift	10	20,000
16-hour shift	10	40,000
Continuous	10	60,000

F. Bearing housings shall be of cast iron or steel and bearing mounting arrangement shall be as indicated or as recommended in the published standards of the manufacturer. Split-type housings may be used to facilitate installation, inspection, and disassembly.

G. Sleeve Type Bearings: Sleeve-type bearings shall have a steel, cast iron or ductile iron housing and Babbitt or bronze liner. Bearing housing shall be bolted and doweled to the lower casing half. These housings shall be provided with cast iron caps bolted in place and the bearing end caps shall be bored to receive the bearing shells. Sleeve bearings shall be designed on the basis of the maximum allowable load permitted by the bearing manufacturer. If the sleeve bearing is connected to an equipment shaft with a coupling, the coupling transmitted thrust will be assumed to be the maximum motor or equipment thrust. Lubricant, lubrication system, and cooling system shall be as recommended by the bearing manufacturer.

H. Plate Thrust Bearings: Thrust bearings shall be the Kingsbury Type, designed and manufactured to maintain the shaft in the fixed axial position without undue heating or the necessity of adjustment or attention. Bearings shall be oil lubricated to suit the manufacturer's standard method of lubrication for the specific bearing. If bearing cooling is required, manufacturer shall provide necessary piping, filters, and valves.

2.9 ELECTRIC MOTORS

A. All motors shall comply with requirements listed in Section 40 05 93 – Common Motor Requirements for Process Equipment. All variable frequency drive (VFD) controlled motors shall comply with NEMA MG-1 Design "B" requirements.

2.10 SPARE PARTS

A. Spare parts, where specified, shall be provided in clearly labeled boxes. Labels shall display "City of Emmett" the major piece of equipment to which the part belongs, the part name, and the manufacturer's part number.

PART 3 - EXECUTION

3.1 PROTECTION

A. Box, crate, or otherwise completely enclose and protect all equipment during shipment, handling, and off-site storage. Responsibility for storage on the job site will be assigned to the Installing Contractor.

B. Protect equipment from exposure to elements and keep all items thoroughly dry at all times. Protect against impact, abrasion, discoloration and other damage. Protect electrical equipment, controls and insulation against moisture, freezing, or water damage.

3.2 INSTALLATION

A. Equipment shall be installed in accordance with the manufacturers written recommendations. The Vendor shall select or recommend the size and type of coupling required to suit each specific application; installation shall be per equipment manufacturer's printed recommendations. All insulating connections shall be installed in accordance with the manufacturer's printed instructions.

B. Alignment: Equipment shall be field tested to verify proper alignment.

3.3 SERVICES OF MANUFACTURER

A. Inspection, Startup, and Field Adjustment: Where required by individual sections, an authorized, experienced, and competent service representative of the manufacturer shall visit the Site for the number of days indicated in those sections to witness or perform the following and to certify in writing that the equipment and controls have been properly installed, aligned, lubricated, adjusted, and readied for operation.

1. Installation of equipment

2. Inspection, checking, and adjusting the equipment and approving its installation

3. Startup and field testing for proper operation, efficiency, and capacity

4. Performing field adjustments during the test period to ensure that the equipment installation and operation comply with requirements

B. Instruction of the Owner's Personnel: Where required by the individual equipment sections, an authorized training representative of the manufacturer shall visit the Site for the number of days indicated in those sections to instruct the Owner's personnel in the operation and maintenance of the equipment, including step-by-step troubleshooting with necessary test equipment. Instruction shall be specific to the models of equipment provided.

1. The representative shall have at least two years' experience in training. A resume of the representative shall be submitted.

2. Training shall be scheduled three weeks in advance of the scheduled session.

3. Proposed training material and a detailed outline of each lesson shall be submitted for review. Review comments from the Engineer shall be incorporated into the material.

4. The training materials shall remain with the trainees after the session. The Vendor shall videotape the training for later use by the Owner's personnel.

3.4 PACKAGED EQUIPMENT

A. When any system is furnished as pre-packaged equipment, the Vendor shall coordinate all necessary space and structural requirements, clearances, utility connections, signals, and outputs with Installation Contractor to avoid later change orders.

B. If the packaged system has any additional features (as safety interlocks, etc.) other than required by the Contract Documents, the Vendor shall coordinate such features with the Engineer and provide all material and labor necessary for a complete installation as required by the manufacturer.

3.5 FIELD TESTS

A. Where indicated by the individual equipment sections, equipment shall be field tested after installation to demonstrate satisfactory operation without excessive noise, vibration, or no overheating of bearings or motor.

B. The following field testing shall be conducted:

1. Start, check, and operate the equipment over its entire operating range. Vibration level shall be within the amplitude limits as indicated or as recommended by the reference applicable Standards.

2. Obtain, record and provide to Engineer concurrent readings of motor voltage, amperage, capacity, vibration, and bearing temperatures for each piece of major equipment.

C. The Engineer shall witness field testing. The Vendor shall notify the Engineer of the test schedule seven days in advance.

D. In the event that any equipment fails to meet the test requirements, the equipment shall be modified and resettled until it satisfies the requirement.

END OF SECTION 43 05 01

SECTION 43 05 50 - EQUIPMENT MOUNTING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section specifies mounts, supports, and the anchorage for equipment, tanks, piping and accessories.

1.2 REFERENCE STANDARDS

A. Federal Specifications

1.	MIL-A-907E	Antiseize Thread Compound, High Temperature

B. Commercial Standards

1.	ASTM A 48	Gray Iron Castings
2.	ASTM A 193	Alloy Steel and Stainless Steel Building Materials for High Temperature Service
3.	ASTM A 194	Carbon and Allow Steel Nuts for Bolts for High Pressure and High Temperature Service
4.	ASTM A 307	Carbon Steel Bolts and Studs, 600,000 psi Tensile Strength
5.	ASTM A 325	Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

1.3 SUBMITTALS

A. Calculations and shop drawings shall be submitted for all of the work required above in accordance with Section 01 30 00 – Vendor Submittals. Anchor bolt and expansion bolt submittals shall be in accordance with requirements specified herein. All calculations must be made and signed by a civil or structural engineer currently registered in the State of Idaho.

B. Inasmuch as some anchorage or equipment mounting is to be made to poured-in-place concrete elements, it is imperative that these types of anchorage be coordinated with the concrete subcontractor so that anchorage may be installed at time of pouring. If calculations and anchorage details are not submitted prior to pouring of concrete, the Contractor shall become responsible for any strengthening of concrete elements because of superimposed seismic loading.

1.4 QUALITY ASSURANCE

A. Support, anchorage and mounting of all tanks, piping and equipment shall be designed and provided by Contractor according to manufacturer's recommendation, 2006 International Building Code and industry standards requirements, unless otherwise specified. All elements required to resist the calculated forces described herein or required by the equipment manufacturer shall be provided by the Contractor.

PART 2 - PRODUCTS

2.1 GENERAL

A. Equipment mountings shall be as shown. All equipment located in floor slabs shall be mounted on concrete pads. Where a steel or cast base is shown or specified between the equipment and the concrete pedestal, it shall be hot-dip galvanized after fabrication.

B. For belt driven equipment shown as in-line and piggyback, the base shall be, rectangular and the motor shall always be behind and above the driven equipment and never over the driven equipment unless approved by the Engineer. Motor mounting hardware for any belt driven configuration shall allow for belt tension adjustment.

2.2 EQUIPMENT SUPPORTS AND FOUNDATIONS

A. Steel Bases: Structural steel bases shall be rectangular in shape for all equipment other than centrifugal refrigeration machines and pump bases, which may be "T" or "L" 1 shaped where shown. Pump bases for split case pump shall include supports for suction and discharge base ells. All perimeter members shall be beams with a minimum depth equal to 1/10th of the longest dimension of the base. Beam depth need not exceed 14 inches provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer. Grout holes shall be provided for the bases of all equipment where vibration isolation is not specified. Where vibration isolation is required, height saving brackets shall be employed in all mounting locations to provide a base clearance of 1 inch.

2.3 CONNECTIONS

A. All pipe connections to equipment shall be supported, anchored, and guided to avoid stresses and loads on equipment flanges and equipment.

B. Flanges and Pipe Threads: All flanges on equipment and appurtenances provided under this Section shall conform to ANSI B16.1, Class 125; or B16.5, Class 150, unless otherwise shown. All pipe threads shall be in accordance with ANSI/ASME B1.20.1.

C. Unless otherwise indicated, equipment supports, anchors, and restrainers shall be adequately designed for static, dynamic, wind, and seismic loads. The design horizontal seismic force shall be the greater of that noted in the general structural notes or as required by the governing building code, or 10 percent of gravity. Submitted design calculations for equipment supports shall bear the signature and seal of an engineer registered in the state wherein the project is to be built, unless otherwise indicated.

D. Equipment Foundations: Mechanical equipment, tanks, control cabinets, enclosures, and related equipment shall be mounted on minimum 4-inch high concrete bases unless otherwise indicated. Equipment foundations are indicated on Drawings. The Contractor through the equipment manufacturer shall verify the size and weight of equipment foundation to insure compatibility with equipment.

E. Couplings: Mechanical couplings shall be provided between the driver and the driven equipment. Flexible couplings shall be provided between the driver the driven equipment to accommodate sight angular misalignment, parallel misalignment, end float, and to cushion shock loads.

1. Unless otherwise indicated or recommended by the equipment manufacturer, coupling type shall be furnished with the respective equipment as follows:

Equipment Type	Coupling Type
Horizontal and end suction pumps	Gear or flexible spring
Vertical non-clog pumps, closed coupled	Flexible disk pack
Single stage centrifugal blowers	Flexible disk pack
Air compressors	Gear or flexible pack

2. Each coupling size shall be determined based on the rated horsepower of the motor, speed of the shaft, and the load classification service factor. The Contractor shall have the equipment manufacturer select or recommend the size and type of coupling required to suit each specific application.

3. Taper-Lock or equal bushing may be used to provide for easy installation and removal of shafts of various diameters.

2.4 ANCHOR BOLTS

A. The Installation Contractor shall be responsible in providing anchor bolts for all owner–furnished and other equipment supplied to this project.

B. Anchor bolt holes in equipment support frames shall not exceed the bolt diameters by more than 25 percent, up to a limiting maximum oversizing of 1/4 inch. Minimum anchor bolt diameter shall be 1/2 inch. Anchor bolts shall be furnished with leveling nuts, the faces of which shall be tightened against flat surfaces as shown to not less than 10 percent of the bolt's safe tensile stress.

C. Tapered washers shall be provided where mating surface is not square with the nut.

D. Adhesive anchors shall comply with requirements listed in Section 05 50 00 – Metal Fabrications.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Each piece of equipment shall be anchored to resist a minimum lateral force required by the code, the manufacturer of the equipment or a lateral seismic force of 40 percent of the operating weight of the equipment, whichever is greater. This force shall be considered acting at the center of gravity of the piece under consideration. No equipment shall be anchored to vertical structural elements without written approval of the Engineer.

B. Equipment which is not vibration isolated shall be anchored directly to the, supporting floor system. In addition to the anchorage, all such equipment shall be internally designed so that all static and moving parts are anchored to the supporting framework to resist the imposed seismic force. All forces must be transmitted to the base in order to be anchored as required. Vibration isolated equipment shall be specially designed to meet these same requirements.

C. Equipment, tanks, piping supports, and anchorage located outside the building shall be designed to comply with the latest International Building Code requirements.

D. All piping, raceways, accessories, and appurtenances furnished with equipment shall be anchored to resist a lateral seismic force of 40 percent of its operating weight without excessive deflection. This force shall be considered acting at the center of gravity of the piece under consideration.

END OF SECTION 43 05 50

SECTION 43 05 60 – PROCESS EQUIPMENT TESTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Testing of mechanical equipment and systems.

B. Related Sections:

1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.

1.2 REFERENCES

A. American National Standards Institute (ANSI):

1. S1.4 Specification for Sound Level Meters.

B. Hydraulic Institute (HI).

1.3 SUBMITTALS

A. Schedule of factory tests and field tests as specified in Section 01 75 16 – Startup Procedures and this Section.

B. Test instrumentation calibration data.

C. Start-up plan as specified in Section 01 75 16 – Startup Procedures.

D. Test plan specified in this Section.

E. Test result reports.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.1 QUALITY CONTROL TESTING AND REPORTING

A. Scheduling and notification:

1. Witnessed source quality control tests: Schedule test date and notify Engineer at least 30 days prior to start of test.

2. Field quality control tests: Schedule test date and notify Engineer at least 7 days prior to start of test.

B. Testing levels:

1. Test equipment based on test levels specified in the equipment section of this Project.

2. Requirements for Test Levels 1 to 4 are defined below.

3. Test levels apply for both Source (Factory) Quality Control Tests and Field Quality Control Tests as specified in the equipment sections of this Project.

4. If testing is not specified in the equipment section, provide Level 1 testing.

5. Requirements of Section 01 75 16 – Startup Procedures apply to Test Levels.

C. Witnessing: Source Quality Control Tests not witnessed unless specified otherwise in the equipment section or Section 01 75 16 – Startup Procedures; Field Quality Control Tests shall be witnessed.

D. Instrumentation: Provide necessary test instrumentation which has been calibrated within 1 year from date of test to recognized test standards traceable to the National Institute of Standards and Technology, Washington, D.C. or approved source. Properly calibrated field instrumentation permanently installed as a part of the Work may be utilized for Field Quality Control Tests.

E. Temporary facilities and labor: Provide necessary fluids, utilities, temporary piping, temporary supports, temporary access platforms or access means and other temporary facilities and labor necessary to safely operate the equipment and accomplish the specified testing. With Owner's permission, some utilities may be provided by fully tested permanently installed utilities that are part of the Work.

F. Test fluids:

1. Factory tests: Use water or air as appropriate at ambient conditions unless specified otherwise in the equipment section.

2. Field tests: Use specified process fluid at available conditions.

G. Pressure testing: Hydrostatically pressure test pressure containing parts in the factory at the appropriate standard or code required level above the equipment component specified design pressure or operating pressure, whichever is higher. Submit pressure test reports before shipping.

H. Test measurement and result accuracy:

1. Use test instruments with accuracies as recommended in the appropriate referenced standards. When no accuracy is recommended in the referenced standard, use 1 percent or better accuracy test instruments. Improved (lower error tolerance) accuracies specified elsewhere prevail over this general requirement.

2. Do not adjust results of tests for instrumentation accuracy. Measured values and values directly calculated from measured values shall be the basis for comparing actual equipment performance to specified requirements.

I. Field testing:

1. Submit test plan as specified in Section 01 75 16 – Startup Procedures and this Section. Indicate test start time and duration, equipment to be tested, other equipment involved or required; temporary facilities required, number and skill or trade of personnel involved; safety issues and planned safety contingencies; anticipated effect on Owner's existing equipment and other information relevant to the test. Provide locations of all instruments to be used for testing. Provide calibration records for all instrumentation.

2. Perform general start-up and testing procedures as specified in Section 01 75 16 – Startup Procedures.

3. Prior to testing, verify equipment protective devices and safety devices have been installed, calibrated, and tested.

J. Reports: Submit reports for source and field-testing. Submit Source Quality Control Test result reports before shipping equipment to the field. Report features:

1. Report results in a bound document in generally accepted engineering format with title page, written summary of results compared to specified requirements, and appropriate curves or plots of significant variables in English units.

2. Include appendix with a copy of raw, unmodified test data sheets indicating test value, date and time of reading, and initials of person taking the data.

3. Include appendix with sample calculations for adjustments to raw test data and for calculated results.

4. Include appendix with the make, model, and last calibration date of instrumentation used for test measurements.

5. Include in body of report a drawing or sketch of the test system layout showing location and orientation of the test instruments relative to the tested equipment features.

3.2 EQUIPMENT TESTING, GENERAL

A. Tests for pumps, all levels of testing:

1. Test in accordance with applicable HI Standards in addition to the requirements in this and other sections.

2. Test tolerances: In accordance with appropriate HI Standards, except the following modified tolerances apply:

a. From 0 to plus 5 percent of head at the specified flows [rated design point flow].

b. From 0 to plus 5 percent of flow at the rated design point head.

c. No negative tolerance for the efficiency at the specified flows [rated design point].

d. No positive tolerance for vibration limits. Vibration limits and test methods in HI Standards do not apply, use limits and methods specified in this or other sections of the Specifications.

B. Tests for drivers: Test motors as specified in Section 40 05 93 – Common Motor Requirements for Process Equipment. Test other drivers as specified in the driver equipment section.

3.3 REQUIREMENTS FOR VIBRATION TESTING

A. Definitions:

1. Peak-to-peak displacement: The root mean squared average of the peak-to-peak displacement multiplied by the square root of 2.

2. Peak velocity: The root mean squared average of the peak velocity multiplied by the square root of 2.

3. Peak acceleration: The root mean squared average of the peak acceleration multiplied by the square root of 2.

4. High frequency enveloping: A process to extract very low amplitude time domain signals associated with impact or impulse events such as bearing or gear tooth defects and display them in a frequency spectrum of acceleration versus frequency.

a. Manufacturers: One of the following or equal:

1) Rockwell Automation, Entek Group, "Spike Energy" analysis.

2) CSI, "PeakVue."

5. Low speed equipment: Equipment or components of equipment rotating at less than 600 revolutions per minute.

6. High speed equipment: Equipment and equipment components operating at or above 600 revolutions per minute.

B. Vibration instrumentation requirements:

1. Analyzers: Use digital type analyzers or data collectors with anti-aliasing filter, 12 bit A/D converter, fast fourier transform circuitry, phase measurement capability, time wave form data storage, high frequency enveloping capabilities, 35 frequency ranges from 21 to 1,500,000 cycles per minute, adjustable fast fourier transform resolution from 400 to 6,400 lines, storage for up to one hundred 3,200 line frequency spectra, RS232C data output port, circuitry for integration of acceleration data to velocity or double integration to displacement.

a. Manufacturers: One of the following or equal:

1) Entek-IRD, Division of Rockwell Automation, Enpac 1200 with applicable data analysis software or Entek Model 838 analyzer with built in printer.

2) Computational Systems Inc., (CSI) Division of Emerson Electric, Model 2120A, Data Collector/analyzer with applicable analysis software.

2. Analyzer settings:

a. Units: English, inches/second, mils, and gravitational forces.

b. Fast fourier transform lines: Most equipment 1,600 minimum; for motors, enough lines as required to distinguish motor current frequencies from rotational frequencies, use 3,200 lines for motors with a nominal speed of 3,600 revolutions per minute; 3,200 lines minimum for High Frequency Enveloping; 1,600 lines minimum for low speed equipment.

c. Sample averages: 4 minimum

d. Maximum frequency (Fmax): 40 times rotational frequency for rolling element bearings, 10 times rotational frequency for sleeve bearings.

e. Amplitude range: Auto select but full scale not more than twice the acceptance criteria or the highest peak, whichever is lower.

f. Fast fourier transform windowing: Hanning Window.

g. High pass filter: Minus 3 dB at 120 cycles per minute for high speed equipment. Minus 3 dB at 21 cycles per minute for low speed equipment.

3. Accelerometers:

a. For low speed equipment: Low frequency, shear mode accelerometer, 500 millivolts per gravitational force sensitivity, 10 gravitational force range, plus/minus 5 percent frequency response from 0.5 hertz to 850 hertz, magnetic mount.

1) Manufacturers: One of the following or equal:

a) Wilcoxon Research, Model 797L.

b) PCB, Model 393C.

b. For high speed equipment: General purpose accelerometer, 100 millivolts per gravitational force sensitivity, 50 gravitational force range, plus/minus 3dB frequency response range from 2 hertz to 12,000 hertz when stud mounted, with magnetic mount holder.

1) Manufacturers: One of the following or equal:

a) Wilcoxon Research, Model 793.

b) Entek-IRD Model 943.

C. Accelerometer mounting:

1. Use magnetic mounting or stud mounting.

2. Mount on bearing housing in location with best available direct path to bearing and shaft vibration.

3. Remove paint and mount transducer on flat metal surface or epoxy mount for High Frequency Enveloping measurements.

D. Vibration testing results presentation:

1. Provide equipment drawing with location and orientation of measurement points indicated.

2. For each vibration measurement take and include appropriate data on equipment operating conditions at the time vibration data is taken; for pumps, compressors, and blowers record suction pressure, discharge pressure, and flow.

3. When Vibration Spectra Data required:

a. Plot peak vibration velocity versus frequency in cycles per minute.

b. Label plots showing actual shaft or part rotation frequency, bearing inner and outer race ball pass frequencies, gear mesh frequencies and relevant equipment excitation frequencies on the plot; label probable cause of vibration peaks whether in excess of specification limits or not.

c. Label plots with equipment identification and operating conditions such as tag number, capacity, pressure, driver horsepower, and point of vibration measurement.

d. Plot motor spectra on a log amplitude scale versus frequency.

4. For low speed equipment, plot peak vibration displacement versus frequency as well as velocity versus frequency.

5. Provide name of manufacturer and model number of the vibration instrumentation used, including analyzer and accelerometer used together with mounting type.

3.4 TESTING LEVELS

A. Level 1 Quality Control Tests:

1. Level 1 General Equipment Performance Test:

a. For equipment, operate, rotate, or otherwise functionally test for 15 minutes minimum after components reach normal operating temperatures.

b. Operate at rated design load conditions.

c. Confirm that equipment is properly assembled, equipment moves or rotates in the proper direction, shafting, drive elements and bearings are installed and lubricated in accordance with proper tolerances, and that no unusual power consumption, lubrication temperatures, bearing temperatures, or other conditions are observed.

2. Level 1 Pump Performance Test:

a. Measure flow and head while operating at or near the rated condition; for factory testing, testing may be at reduced speeds with flow and head corresponding to the rated condition when adjusted for speed using the appropriate affinity laws.

b. Use of a test driver is permitted for factory tests when actual driver is given a separate test at its point of manufacture. Use actual driver for field tests.

c. Record measured flow, suction pressure, discharge pressure, and make observations on bearing temperatures and noise levels.

3. Level 1 Vibration Test:

a. Test requirement:

1) Measure filtered vibration spectra versus frequency in 3 perpendicular planes at each normally accessible bearing housing on the driven equipment, any gears and on the driver; 1 plane of measurement to be parallel to the axis of rotation of the component.

2) Vibration spectra versus frequency shall be in accordance with Vibration Acceptance Criteria.

b. Equipment operating condition: Test at specified maximum speed.

4. Level 1 Noise Test:

a. Measure unfiltered overall A-weighted sound pressure level in dBA at 3 feet horizontally from the surface of the equipment and at a mid-point of the equipment height.

B. Level 2 Quality Control Tests:

1. Level 2 General Performance Test:

a. For equipment, operate, rotate, or otherwise functionally test for at least 2 hours after components reach normal operating temperatures.

b. Operate at rated design load conditions.

c. Confirm that equipment is properly assembled, equipment moves or rotates in the proper direction, shafting, drive elements and bearings are installed and lubricated in accordance with proper tolerances, and that no unusual power consumption, lubrication temperatures, bearing temperatures, or other conditions are observed.

2. Level 2 Pump Performance Test:

a. Test 2 hours minimum for flow and head at the rated condition; for factory testing, testing may be at reduced speeds with flow and head corresponding to the rated condition when adjusted for speed using the appropriate affinity laws.

b. Use of a test driver is permitted for factory tests when actual driver is given a separate test at its point of manufacture. Use actual driver for field tests.

c. Test for flow and head at 2 additional conditions; 1 at 25 percent below the rated flow and 1 at 10 percent above the rated flow.

d. Record measured flow, suction pressure, discharge pressure, and observations on bearing temperatures and noise levels at each condition.

3. Level 2 Vibration Test:

a. Test requirement:

1) Measure filtered vibration spectra versus frequency and measure vibration phase in 3 perpendicular planes at each normally accessible bearing housing on the driven equipment, any gears and on the driver; 1 plane of measurement to be parallel to the axis of rotation of the component; measure actual rotational speeds for each vibration spectra measured using photometric or other tachometer input connected directly to the vibration data collector.

2) Vibration spectra versus frequency shall be in accordance with Vibration Acceptance Criteria.

b. Equipment operating condition: Repeat test requirements at design specified maximum speed and at minimum speed for variable speed equipment.

c. Natural frequency test of field installed equipment:

1) Excite the installed equipment and support system in 3 perpendicular planes, use same planes as operating vibration measurement planes, and determine the as-installed natural resonant frequency of the driven equipment, the driver, gears and supports.

2) Perform test at each bearing housing, at each support pedestal, and for pumps on the suction and discharge piping.

3) Perform with equipment and attached piping full of intended service or process fluid.

4. Level 2 Noise Test:

a. Measure filtered A-weighted overall sound pressure level in dBA for each of 8 octave band mid-points beginning at 63 hertz measured at 3 feet horizontally from the surface of the equipment at mid-point height of the noise source.

C. Level 3 Quality Control Tests:

1. Level 3 General Equipment Performance Tests:

a. For equipment, operate, rotate, or otherwise functionally test for at least 4 hours after components reach normal operating temperatures.

b. Operate at rated design load conditions for 1/2 the specified time; operate at each of any other specified conditions for a proportionate share of the remaining test time.

c. Confirm that equipment is properly assembled, equipment rotates in the proper direction, shafting and bearings are installed and lubricated in accordance with proper tolerances, and that no unusual noise, vibration or temperatures are observed.

d. Take appropriate capacity, power or fuel consumption, torque, revolutions per minute, pressure and temperature readings using appropriate test instrumentation to confirm equipment meets specified performance requirements at the design rated condition.

e. Bearing temperatures: During maximum speed or capacity performance testing, measure and record the exterior surface temperature of each bearing versus time.

2. Level 3 Pump Performance Test:

   a. Test 4 hours minimum for flow and head at or near the rated condition; for factory testing, testing may be at reduced speeds with flow and head corresponding to the rated condition when adjusted for speed using the appropriate affinity laws.

   b. Use of a test driver is permitted for factory tests when actual driver is given a separate test at its point of manufacture. Use actual driver for field tests.

   c. Test each specified flow and head condition at the rated speed and test at minimum as well as maximum specified speeds; operate at each test condition for a minimum of 15 minutes; for factory testing, test at other speeds may be omitted if test driver at reduced speeds is used for rated condition testing.

   d. Record measured shaft revolutions per minute, flow, suction pressure, discharge pressure; record measured bearing temperatures (bearing housing exterior surface temperatures may be recorded when bearing temperature devices are not required by the equipment section) and record observations on noise levels.

3. Level 3 Vibration Test:

   a. Requirements: Same as Level 2 vibration test except data taken at each operating condition tested and with additional requirements below.

   b. Perform High Frequency Enveloping Analysis for gears and bearings.

      1) Measure bearing element vibration directly on each bearing cap in a location close as possible to the bearing load zone that provides a smooth surface and direct path to the bearing to detect bearing defects.

      2) Report results in units of acceleration versus frequency in cycles per minute.

   c. Perform Time Wave Form analysis for gears, low speed equipment and reciprocating equipment; plot true peak amplitude velocity and displacement versus time and label the period between peaks with the likely cause of the periodic peaks (relate the period to a cause).

   d. Plot vibration spectra on 3 different plots; peak displacement versus frequency, peak acceleration versus frequency and peak velocity versus frequency.

4. Level 3 Noise Test: Measure filtered, un-weighted overall sound pressure level in dB at 3 feet horizontally from the surface of the equipment at mid-point height and at 4 locations approximately 90 degrees apart in plan view; report results for each of 8 octave band mid-points beginning at 63 hertz.

D. Level 4 Quality Control Tests:

1. Level 4 General Equipment Performance Test:

   a. For equipment, operate, rotate, or otherwise functionally test for at least 8 hours after components reach normal operating temperatures.

   b. Operate at rated design load conditions for 1/2 the specified time; operate at each of any other specified conditions for a proportionate share of the remaining test time.

   c. Confirm that equipment is properly assembled, equipment rotates in the proper direction, shafting and bearings are installed and lubricated in accordance with proper tolerances, and that no unusual noise, vibration or temperatures are observed.

   d. Take appropriate capacity, power or fuel consumption, torque, revolutions per minute, pressure and temperature readings using appropriate test instrumentation to confirm equipment meets specified performance requirements at the design rated condition.

   e. Bearing temperatures: During maximum speed or capacity testing, measure and record the exterior surface temperature of each bearing versus time.

2. Level 4 Pump Performance Test:

   a. Test 8 hours minimum for flow and head; begin tests at or near the rated condition; for factory and field-testing, test with furnished motor at full speed.

   b. Test each specified flow and head condition at the rated speed and test at minimum as well as maximum specified speeds; operate at each test condition for a minimum of 20 minutes or longer as necessary to measure required performance, vibration and noise data at each test condition.

   c. Record measured shaft revolutions per minute, flow, suction pressure, discharge pressure; record measured bearing temperatures (bearing housing exterior surface temperatures may be recorded when bearing temperature devices not required by the equipment section) and record observations on noise levels.

   d. Bearing temperatures: During maximum speed or capacity testing, measure and record the exterior surface temperature of each bearing versus time.

   e. Perform efficiency and/or Net Positive Suction Head Required (NPSHr) and/or priming time tests when specified in the equipment section in accordance with the appropriate HI standard and as follows:

1) Perform NPSHr testing at maximum rated design speed, head and flow with test fluids at ambient conditions; at maximum rated speed, test at 15 percent above rated design flow, and 25 percent below rated design flow.

2) Perform efficiency testing with test fluids at maximum rated speed.

3) Perform priming time testing with test fluids at maximum rated speed.

3. Level 4 Vibration Test: Same as Level 3 vibration test.

4. Level 4 Noise Test: Same as Level 3 Noise Test except with data taken at each operating condition tested.

3.5 SOURCE QUALITY CONTROL

A. Test equipment as specified for each type of test at the test levels specified in equipment sections. Prepare and submit test reports as specified.

B. Inspection and balancing:

1. Statically and dynamically balance each of the individual rotating parts as required to achieve the required field vibration limits. Statically and dynamically balance the completed equipment rotating assembly and drive shaft components.

2. Furnish copies of material and component inspection reports including balancing reports for equipment system components and for the completed rotating assembly.

C. Critical speed of rotating equipment: Satisfy the following:

1. The first lateral and torsional critical speed of all constant, variable, and 2-speed driven equipment that is considered rigid such as horizontal pumps, all non-clog pumps, blowers, air compressors, and engines shall be at least 25 percent above the equipment's maximum operating speed.

2. The first lateral and torsional critical speed of all constant, variable, and 2-speed driven equipment that is considered flexible or flexibly mounted such as vertical pumps (vertical in-line and vertical non-clog pumps excluded) and fans shall at least 25 percent below the equipment's lowest operating speed.

3. The second lateral and torsional critical speed of all constant, variable, and 2-speed equipment that is considered flexible or flexibly mounted shall be at least 25 percent above the maximum operating speed.

3.6 FIELD QUALITY CONTROL

A. Test equipment as specified for each type of test at the test levels specified in equipment sections. Prepare and submit test reports as specified. Comply with latest version of applicable standards.

B. For variable speed equipment, conduct test to establish performance over the entire speed range and at the average operating condition. Establish performance curves for:

1. The speed corresponding to the rated maximum capacity.

2. The speed corresponding to the minimum capacity.

3. The speed corresponding to the average operating conditions.

3.7 VIBRATION ACCEPTANCE CRITERIA

A. Testing of rotating mechanical equipment: Tests are to be performed by an experienced, factory trained, and independent authorized vibration analysis expert.

B. Vibration displacement limits: Unless otherwise specified, equipment operating at speeds 600 revolutions per minute or less is not to exhibit unfiltered readings in excess of following:

Operating Speed (revolutions per minute)	Unfiltered (Overall) Peak-to-Peak Amplitude (mils)
	All Rotating Equipment
0 - 300	6.5
301 - 600	4.5
Note: For all equipment, axial shaft displacements not to exceed 50 percent of the maximum radial shaft displacements shown in the table relative to the casing.	

C. Vibration velocity limits: Unless otherwise specified, equipment operating at speeds greater than 600 revolutions per minute is not to exceed the following peak velocity limits:

Item	Unfiltered Overall Limit (inches per second)	Any Filtered Peak Limit (inches per second)
Non-Clog Solids Handling Centrifugal Pumps	0.35	0.25
Horizontal and Vertical In-Line Centrifugal Pumps (other than Non-Clog type)	0.18 (Input BHP 25 or less)	0.14 (Input BHP 25 or less)
	0.22 (Input BHP more than 25 but less than 100)	0.18 (Input BHP more than 25 but less than 100)
	0.25 (Input BHP 100 or more)	0.20 (Input BHP 100 or more)
Vertical Turbine, Mixed Flow, and Propeller Pumps	0.31 (Input BHP 100 or less)	0.22
	0.35 (Input BHP 125 or more)	0.25
Vertical Turbine, Mixed Flow, and Propeller Short Set Pumps	0.28 (Input BHP 100 or less)	0.21
	0.33 (Input BHP 125 or more)	0.24
Motors	See Applicable Motor Specification	
Gear Reducers, Radial	Not to exceed AGMA 6000-A88 limits	
Other Reducers, Axial	0.10	0.10
Centrifugal Fans and Blowers	0.15	0.10
Other Equipment, Radial	0.16	0.10
Other Equipment, Axial	0.10	0.10

D. Equipment operation: Measurements are to be obtained with equipment installed and operating within capacity ranges specified and without duplicate equipment running.

E. Additional criteria:

1. No narrow band spectral vibration amplitude components, whether sub-rotational, higher harmonic, or synchronous multiple of running speed, are to exceed 40 percent of synchronous vibration amplitude component without manufacturer's detailed verification of origin and ultimate effect of such excitation.

2. The presence of discernable vibration amplitude peaks in Test Level 2 or 3 vibration spectra at bearing inner or outer race frequencies shall be cause for rejection of the equipment.

3. For motors, the following shall be cause for rejection:

   a. Stator eccentricity evidenced by a spectral peak at 2 times electrical line frequency that are more than 40 percent of the peak at rotational frequency.

   b. Rotor eccentricity evidenced by a spectral peak at 2 times electrical line frequency with spectra side bands at the pole pass frequency around the 2 times line frequency peak.

   c. Other rotor problems evidenced by pole pass frequency side bands around operating speed harmonic peaks or 2 times line frequency side bands around rotor bar pass frequency or around 2 times the rotor bar pass frequency.

   d. Phasing problems evidenced by 1/3 line frequency side band spectral peaks around the 2 times electrical line frequency peak.

4. The presence of peaks in a High Frequency Enveloping spectra plot corresponding to bearing, gear or motor rotor bar frequencies or harmonics of these frequencies shall be cause for rejection of the equipment; since inadequate lubrication of some equipment may be a cause of these peaks, lubrication shall be checked, corrected as necessary and the high frequency envelope analysis repeated.

3.8 NOISE REQUIREMENTS AND CONTROL

A. Make measurements in relation to reference pressure of 0.0002 microbar.

B. Make measurements of emitted noise levels on sound level meter meeting or exceeding ANSI S1.4, Type II.

C. Set sound level meter to slow response.

D. Unless otherwise specified, maximum free field noise level not to exceed 85 dBA measured as sound pressure level at 3 feet from the equipment.

3.9 FUNCTIONAL AND OPERATIONAL TESTING OF EQUIPMENT

A. Functional testing as specified in Section 01 75 16 – Startup Procedures and this Section.

B. General checkout: Prior to operating equipment, inspect, test, and check supporting systems, including but not limited to power systems, control systems, piping systems, lubrication systems, and safety systems.

   1. Test and calibrate instrumentation and electrical devices.

   2. As a minimum for control systems associated with the equipment, perform the following:

      a. Individual Loop Tests: Test from field device to intermediate terminations to controller and back to controlled element.

b. End-to-end test: Simulate input at field device and observe control system response at the final field control element.

3. Prior to testing, provide signed and dated certificates of calibration for test instrumentation and equipment.

C. Operation of related existing equipment: Owner will operate related existing equipment or facilities necessary to accomplish the testing.

D. Acceptable tests: Demonstrate the equipment performance meets the requirements of this Section and the equipment section; when the equipment fails to meet the specified requirements, perform additional more detailed testing to determine the cause, correct, repair, or replace the causative components and repeat the testing that revealed the deficiency.

E. Operational testing: As specified in Section 01 75 16 – Startup Procedures.

END OF SECTION 43 05 60

SECTION 46 21 35 - ROTARY DRUM FINE SCREEN

PART 1 - PART 1 - GENERAL

1.1 SCOPE

A. The Vendor shall furnish, install, and place into satisfactory operating condition one (1) rotary perforated plate fine screen for removing floating, particulate, or fibrous material and to transport washed and dewatered screenings to an auger conveyor as shown on the Drawings and described in the Specifications.

B. All equipment called for under this Section shall be supplied by a single manufacturer.

C. The NEC classification for the Headworks Building is Class 1, Division 1 Hazardous location. Equipment and accessories shall be rated for this environment.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM) Publications:

1. Section A322: Carbon and Alloy Steel Bar Specifications.

2. Section A507-10: Standard Specification for Drawing Alloy Steel, Sheet and Strip, Hot-Rolled and Cold Rolled

B. Anti-Friction Bearing Manufacturers Association (AFBMA) Publications:

1. Standard 9-90 Load Ratings and Fatigue Life for Ball Bearings.

2. Standard 11-90 Load Ratings and Fatigue Life for Roller Bearings.

C. American Institute of Steel Construction (AISC) Publications

D. American Welding Society (AWS) Publications

E. American Structures Painting Council (ASPC) Publications

1.3 SUBMITTALS

A. Submit in accordance with Section 01 30 00 – Vendor Submittals. Submittals shall include but not be limited to the following:

1. A complete set of drawings, specifications, catalog cut sheets, and detailed descriptive material. This information shall identify all technical and performance requirements stipulated on the drawings and in the specification.

2. Detailed installation drawings illustrating how the proposed screen fits in the channel. The drawings shall include plan, elevation, and sectional views of the installation. Drawings shall include details of the seal between the screen and the channel, and details of the anchor bolt locations.

3. Hydraulic performance curves showing the relationship of head loss versus the full range of downstream liquid depths for the maximum clean water flow, the maximum flow, the average flow, and 33% of the average flow as noted in paragraph 2.02.A. Curves based upon other manufacturer's data will not be accepted.

4. Complete reference list of all installations of same and similar equipment including contact names and phone numbers, showing at least 10 installations of the same type and size as specified.

5. Detailed information shall be submitted for all items such as hardware, motors, reducers, motor controllers, and instrumentation (field devices, major control panel devices, and anticipated control panel layout).

6. Vendor data shall be furnished to confirm the torque and thrust rating of the drive.

7. List showing materials of construction of all components.

8. Manufacturer's recommended spare parts.

9. Information on equipment field erection requirements including total weight of assembled components and weight of each sub-assembly.

10. Detailed installation instructions, with clear step-by-step points on the correct mechanical and electrical installation procedures.

11. A maintenance schedule showing the required maintenance, frequency of maintenance, lubricants, and other items required at each regular preventive maintenance period, including all buy-out items.

12. Process equipment electrical requirements and schematic diagrams.

13. Functional description of controls.

14. Certification by the manufacturer that all stainless-steel equipment will be manufactured in a stainless steel only factory.

15. Certification that the entire equipment will be passivated by submersion in an acid bath as specified.

16. A copy of documents proving certification of the Manufacturer's Quality Management System according to ISO 9001 and Environmental Protection Management System according to ISO 14001.

B. Submit Operation and Maintenance Data in accordance with Section 01 78 23 – Operation and Maintenance Data.

1.4 FEATURES

A. The perforated plate screen shall consist of a rotating cylindrical screen with an integral collection hopper, screw conveyor, and screenings press. The perforated plate screen shall use a single drive for screening, conveying, dewatering and compressing screening material. The screen shall have an inclination of 35 degrees.

B. Operation of the rotating basket perforated plate screen and spray bar shall be automatically initiated at a preset high liquid level. Screens which operate continuously or via timer only will not be acceptable. The rotating basket shall remove solids from the screening basket and deposit them into the concentric screw conveyor and collection hopper using a spray bar providing positive cleaning of the screen basket surface.

C. The screenings shall be transported up the screw conveyor, through an integrated screening washing system, a compaction and dewatering zone and then shall be discharged. The collected water on the bottom of the collection hopper shall be transported by pipeline and discharged upstream of the screen via a flush solenoid valve.

D. All open spaces of the screen shall be positively cleaned via a high-pressure spray bar system. Screens using a rotating rake or only screw flights with brushes will not be acceptable.

E. The control system shall be designed so that the cleaning characteristics of the screen and spray wash systems can be changed via the programmable controller. Systems which do not offer this feature will not be acceptable for this project.

F. To minimize odors and nuisance insect populations, the rotary perforated plate screen transport system and compaction/dewatering system shall be completely enclosed.

G. The spray wash systems shall be completely enclosed to prevent spray, aerosols, and leakage from coming in contact with the operating floor.

1.5 QUALITY ASSURANCE

A. The equipment manufacturer shall, in addition to the Vendor, assume the responsibility for proper installation and functioning of the equipment.

B. Manufacturer shall have a minimum of twenty (20) years experience producing equipment substantially similar to that required and shall be able to submit documentation of at least ten (10) independent installations using the same size or larger equipment as detailed in the below. Each installation must have been in satisfactory operation for at least three (3) years.

C. Manufacturer shall have established an ISO 9001 certified quality management system.

D. Equipment suppliers not utilizing ISO 9001 facilities shall not be considered or approved for this project. Equipment supplier shall provide evidence of certification before being named as an acceptable manufacturer.

E. Manufacturer shall have established an ISO 14001 certified environmental protection management system designed to monitor and help minimize the harmful effects on the environment caused by its manufacturing processes. Equipment suppliers not utilizing ISO 14001 facilities shall not be considered or approved for this project. Equipment supplier shall provide evidence of certification before being named as an acceptable manufacturer.

F. All welding is performed in accordance with American Welding Society (AWS) D1.1 Structural Welding Code, or equivalent. All welding in the factory shall use shielded arc, inert gas, MIG or TIG method. Filler wire shall be added to all welds to provide for a cross section equal to or greater than the parent metal. Butt welds shall fully penetrate to the interior surface and gas shielding to interior and exterior of the joint shall be provided.

G. Manufacturer shall provide screen, motors, gear reducers, controls, control panels, and lifting attachments as a complete integrated package to ensure proper coordination, compatibility, and operation of the system. The manufacturer shall test-run the fully assembled machine in their factory before shipment

H. The Contract Documents represent the minimum acceptable standards for the screening equipment for this project. All equipment shall conform fully in every respect to the requirements of the respective parts and sections of the drawings and specifications. If not named, equipment which is a "standard product" with that manufacturer shall be modified, redesigned from the standard mode, and shall be furnished with special features, accessories, materials of construction or finishes as may be necessary to conform to the quality mandated by the technical and performance requirements of the specification.

I. The entire unit shall be manufactured from AISI 304L stainless steel shapes. All components made of stainless steel shall be passivated by full submergence in a pickling bath for perfect surface finishing. No stainless steel components may be fabricated or assembled in a factory where carbon steel products are also fabricated, in order to prevent contamination by foreign debris which can cause corrosion of stainless steel.

J. Electric motors, gear reducers, and other self-contained or enclosed components shall have an acrylic enamel finish.

K. All stainless steel parts of the unit shall be fully submerged into a pickling bath for at least 8 hours to remove welding spots and to protect the stainless steel against corrosion. Glass bead blast or chemically treated stainless steel shall not be allowed.

L. Fabrication shall be done in compliance with all applicable ASTM standards or equivalent international standards.

M. Bolts, nuts and washers shall be selected from AISI 304L or 316L stainless steel such that they are anti-seizing.

N. A written manufacturer warranty shall be provided. The warranty shall be for a minimum period of one (1) year from the date of Substantial Completion. Manufacturer shall repair or replace all defects of materials or workmanship in the equipment during the warranty period. Corrections shall be completed within five (5) days after notification.

O. Manufacturer shall provide services by a factory-trained Service Engineer, specifically trained on the type of equipment specified. The Service Engineer requirements include, but are not limited to the following:

1. The Service Engineer shall be present during initial energizing of equipment to determine directional testing as described in Section 3.3.

2. The Service Engineer shall inspect and verify location of anchor bolts, placement, leveling, alignment and field erection of equipment, as well as control panel operation and electrical connections.

3. The Service Engineer shall provide classroom and/or field training on the operation and maintenance of the equipment to operator personnel. These instructions may include the use of slides, videos, literature, and/or oral presentations.

4. Manufacturer shall state field service rates for a Service Engineer to Owner and Installation Contractor. In the event that the field service time required by this section should not be sufficient to properly place the equipment into operation, and the requirement for additional time is beyond the manufacturer's responsibility, additional time shall be purchased by Installation Contractor to correct deficiencies in installation, equipment, or material without additional cost to Owner.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. The perforated plate screen shall consist of a rotating cylindrical screen with an integral collection hopper, screw conveyor, and screenings press.

B. The screening system shall be complete with local controls, main control panel, and level sensor.

C. All fabricated parts of the screen shall be stainless steel.

D. Screen Design Summary:

1. Number of screens 1

2. Maximum clean water flow per screen, MGD 8.6

3. Maximum wastewater flow per screen, MGD 6.41

3.	Maximum upstream water level per screen, inches	35.7
5.	Nominal screening basket diameter, inches	55
6.	Channel width, inches Nominal Screw Conveyor Section Diameter, inches	58 14
7.	Minimum drive motor size, hp	2
8.	Wash water flow rate, gal/min	46
9.	Wash water pressure, psig	100
10.	Maximum wet screenings capacity, cubic feet per hour	80
11.	Screen opening size, mm	3

2.2 PERFORMANCE

A. The perforated plate screen shall be designed to handle the maximum flow rate noted in paragraph 2.1.D.2 with the maximum upstream liquid level noted in paragraph 2.1.D.3.

B. The average perforated plate screen flow through velocity shall not exceed 3.3 ft/sec (1.0 m/sec) under any flow condition up to the maximum hydraulic capacity noted in paragraph 2.1.D.2.

C. The screening equipment shall produce dewatered screenings capable of passing the EPA Paint Filter Test as described in Method 9095 of EPA Publication SW-486.

D. MATERIALS

1. Unless otherwise specified in these specifications, the entire equipment shall be manufactured from AISI 304L austenitic stainless steel shapes (rods, angles, and channels), pipes, and sheets. All mechanical parts shall be designed to handle the forces that may be exerted on the unit during fabrication, shipping, erection, and proper operation according to the O&M manual.

2. The entire equipment shall be manufactured in a stainless steel only factory to prevent contamination of the stainless steel with foreign contaminants.

3. The equipment, after its fabrication, shall undergo a passivation (pickling) process to ensure maximum resistance to corrosion. All stainless steel components and structures shall be submersed in a chemical bath of 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 removal from the pickling bath, the equipment must be washed with a high-pressure wash of cold water to remove any remaining surface debris and promote the formation of an oxidized passive layer which is critical to the long life of the stainless steel. Submergence insures complete coverage. Spray on chemical treatments and glass bead blasting are specifically not acceptable due to their inability to provide complete and uniform corrosion protection.

2.3 ROTARY PERFORATED PLATE SCREEN

A. Screen

1. The rotary perforated plate screen shall be designed and built to withstand static and hydraulic forces exerted by the liquid to the screen. All structural and functional parts shall be sized for the loads encountered during the screening, conveying and pressing operations. All submerged components and all components of the rotary perforated plate screen in contact with the screened solids shall be of stainless steel construction.

2. The screen basket shall be of a cylindrical shape. The perforated plate shall go around the entire basket circumference.

3. The nominal perforation size shall be 3 mm. Bar screens or wedge wire will not be an acceptable screen media.

4. The upper end of the basket shall incorporate a support ring which shall be machined and supported by three (3) guide rollers made of polyamide. The guide rollers shall be attached to an upper support plate. This plate shall match a flange that is attached to the augur tube to ensure proper alignment of the basket. A brush shall be clamped to the upper support plate sealing the gap between the rotating screen basket and the fixed upper support plate over the complete 360-degree area. Screens which have a gap in the brush sealing between the 2 o'clock and 10 o'clock position will not be allowed.

5. The lower support ring of the basket shall be connected to the shaft of the auger and be driven by a common drive with the auger. The basket shall be connected with a solid support arm at the lower end of the basket which is bolted to the auger shaft.

6. The minimum diameter of the screening basket shall be as noted above. The basket diameter shall be matched with a sufficient number of clear openings to ensure the maximum flow rate is achieved.

7. A seal plate shall be provided to enclose the circular screen in the channel. The seal plate shall be one-piece fabricated of stainless steel and shall bolted to the tank wall with an angle profile on each side. The sealing plate shall be of sufficient height to prevent bypassing of flow around the screen at the maximum screen hydraulic capacity. A polyurethane seal which is fixed to the front side of the seal plate shall be provided to ensure proper sealing of the rotating screen basket against the fixed sealing plate. This polyurethane seal ensures that there will be no bypass of unwanted solids through the screen. Screens using a brush for sealing the gap between the fixed seal plate and the rotating screen basket shall not be allowed.

8. The screen shall be provided with a support stand. The support stand shall be fabricated from stainless steel Double-C-Channels having the minimum dimensions of 7 inches by 2.75 inches with a thickness of 0.125 inches.

9. The screen shall be provided with a stainless steel housing of four wall plates and a cover. The housing shall be made of 5/64 inch thick stainless steel plate. The cover shall be made of 0.06 inch thick plate. The cover shall be removable and shall be secured with turn-locks.

B. SCREEN CLEANING

1. The screen basket shall rotate in one direction and pass through the topmost position where it is cleaned with a stainless-steel high-pressure spray bar.

2. A stainless steel backed nylon brush shall be attached to the rotating basket and positioned to make contact with the screening trough to sweep material caught on the edges of the trough. Brush bristles shall be high-strength nylon for superior life.

C. Screenings Conveyor and Screenings Dewatering Press

1. The auger tube shall have a diameter of 10.75 inches. The auger tube shall incorporate two (2) anti-rotation bars which shall be welded to the inside of the transport tube along the longitudinal axis. The screw shall not be in contact with the anti-rotation bars during normal operation, the screw shaft shall be supported by a Teflon® lined bronze slide bearing at the bottom and the gear box at the top.

2. A support flange with a minimum thickness of 0.6 inches shall be welded to the screenings transport tube. The screen basket rollers and the screenings collection hopper shall be attached to this plate.

3. A gear box support flange with a minimum thickness of 0.467 inches shall be welded to the upper end of the screenings transport tube for attachment of the drive assembly.

4. A shafted auger screw that is entirely made of stainless steel shall be provided to transport and dewater the screened material. A shaft-less screw shall not be acceptable. Screw flights shall be of decreasing pitch approaching the compaction zone to provide a mechanical compressing action on the screenings material. The shaft shall have a diameter of 3.5 inches and shall have flights with a minimum thickness of 0.2 inches in the transport zone and 0.4 inches in the compaction zone. A replaceable flight section with an angle of about 120 degrees that is bolted to the shaft shall be provided at the bottom of the shaft where the wear is highest.

5. The auger shaft shall be fitted with an upper and a lower solid stub. Stubs and screw shaft shall be accurately machined and shrink-fitted.

6. The lower end of the screenings conveyor shall be supported by a sealed, self-lubricated Teflon® lined bronze slide bearing. This bearing shall not take any thrust load from the screw conveyor. Lower ball or roller bearings, or bearings requiring lubrication, shall not be acceptable.

7. The lower bearing shaft and arm shall be designed to minimize material wrapping around the shaft. A seal plate shall be furnished to mate between the stationary lower bearing support and the rotating arm to prevent material intrusion into the bearing seals.

8. A compaction zone shall be an integral part of the screenings screw conveyor and transport tube design. The compaction zone shall be designed to form a screenings plug of material and to return water released from the screened material back to channel through 0.2 inch (5 mm) diameter perforations that are machined into the screenings transport tube in a square configuration.

9. The compaction zone shall be provided with split glass fiber reinforced housing, furnished with gaskets and bolts, and easily removable for access. Designs requiring removal of the drive assembly, discharge head, or screw conveyor to gain access to the compaction zone will not be acceptable. The housing shall be provided with a drain connection at its lowest point and a clamped flexible PVC hose for drain water whose other end is connected to a connection through the screen basket's upper support flange to return the drain water into the screen basket. The plastic housing shall also be provided with a 1-inch flush connection.

D. SCREEN TROUGH

1. The center of the screen shall be provided with a closed screenings trough that is bolted to the bottom of the collection hopper. A suction pipe shall be mounted in the trough area below the perforated plate of the hopper for removing and transporting the collected wash water to the upstream side of the screen by a flush solenoid valve.

2. A PVC dip pipe for level control shall be mounted in the trough area below the perforated plate of the hopper and shall control the suction process by measuring water levels in the closed trough based on the bubbler method.

E. Drive

1. The basket mechanism and transport screw shall be driven by a shaft-mounted geared motor. The geared motor shall have a minimum service factor of 1.0. The motor shall be provided with thermostats to provide thermal overload protection in addition to current overload protection.

2. The gear reducer shall be bolted to a machined flange welded to the upper end of the transport tube.

3. The gear reducer shall be driven by a 3 phase, 60 Hertz, 230/460 volt, Class 1, Division 1, Group D inverter-duty, totally-enclosed, fan-cooled motor which leads to a conduit box for outdoor operation. The motor rating shall be a minimum of

4. 2.0 HP.

F. Spray Wash Systems

1. The screen shall be designed for a water supply of 46 gpm and shall be provided with wash water distribution manifold with a single 1.5-inch point for connecting to the treatment plants final effluent water supply.

2. An automatic spray wash system shall be provided for cleaning of the screen basket and shall be constructed of minimum 1-inch diameter piping and minimum 1-inch diameter flexible reinforced PVC hose. The spray wash system shall include an outer spray bar with spray nozzles. Spray wash systems shall be operated only while the screen basket is rotating. The spray wash system shall include a solenoid valve for flow control. Minimum pressure to the spray wash shall be 100 psi (7 bar).

3. The screen shall incorporate a screenings washing system (IRGA) consisting of two washing points, one being in the rising tube of the screen and the second being in the screenings collection hopper. The screenings wash zone in the conveyor tube shall be provided with three nozzles located equidistant around the circumference to maximize the washing performance. A lower wash system shall be located over the open top of the screen and shall utilize a spray bar with a minimum of 2 spray nozzles. The screenings washing system shall include a 1-inch solenoid valve for flow control.

4. The screen compaction zone shall be provided with a wash nozzle designed to flush the entire interior surface of the compaction zone housing to ensure no debris buildup can occur. The compaction zone flushing system shall include a single 1-inch solenoid valve for flow control.

5. The solenoid valves shall be operated via the programmable controller and/or manually.

6. Solenoid valves shall be minimum 1-inch diameter, brass body, 2-way, and designed for 110 VAC operation with an explosion-proof rating. Solenoid valves shall be normally closed and rated for a minimum of 140 psig.

7. A brass body, Y-strainer shall be provided for each spray wash system. The strainer shall include a removable and washable stainless steel 20-mesh (800 micron) filter element. A water manifold with one input and four output water connections shall be provided.

2.4 CONTROL SYSTEM

A. All controls necessary for the fully automatic operation of the screen shall be provided including a NEMA 12 main control panel and a NEMA 7 local control station. The control strategy shall be as described in Section 40 61 96 – Control Strategies.

B. The electrical control system shall provide for automatic control of the screen via a high liquid level using a Siemens ultrasonic controller and level sensor in combination with an adjustable timer for each screen. The screen shall operate at a high liquid level or a pre-determined time sequence to provide a variable time between cleaning operations. The level transmitter shall be mounted next to the main control panel. Owner/Installation Contractor shall install the level sensor and provide wiring to the main control panel.

C. The main control panel shall be wall mounted in the electrical room and include the following items to control the screen:

1. Door-interlocked and fused disconnect
2. 600 VAC terminal block
3. Control power transformer with 120 VAC transient voltage surge compressor (TVSC) and fused primary and secondary
4. Programmable logic controller (PLC), Allen Bradley Micrologix 1400
5. Operator Interface (OIU), Allen Bradley PanelView C400
6. At minimum, provide the following for the screen:
   a. Pilot lights for:
      1) Control power on (white)
      2) Screen running (green)
      3) Screen high level (amber)
      4) Screen fault (red)
   b. E-stop push button (red)
   c. Screen reset push button (black)
   d. Circuit Breaker Branch Circuit Protection for screen motor
   e. Door-mounted elapsed time meter for screen drive

f. Digital inputs for the following:

1) Machine start upstream water level

2) Maximum water level

3) One spare input

g. Remote dry contact outputs for the following for each screen:

1) Screen running

2) Screen fault

3) Screen E-stop

4) Screen high level

5) One spare output

7. Flashing alarm light and alarm horn with silencer-reset button

8. Plastic nameplates

9. Electrical enclosure shall be provided in accordance with NEMA 12 painted carbon steel

D. A local operator station shall be provided for the screen and shall be suitable for wall-mounting. Enclosure shall be NEMA 7 cast aluminum, and shall include the following:

1. Hand-Off-Auto selector switches for the screen drive

2. Forward-Off-Reverse selector switch for screen drive

3. Spray wash pushbuttons (push to test) for spray bar

4. E-stop pushbutton (red)

5. Cast aluminum enclosure rated for Class 1 Division 1 environment

E. A bubbler panel shall be provided and shall be suitable for wall-mounting. Enclosure shall be NEMA 4X, and shall include the following:

1. Air pump

2. Pressure switch

3. Plastic tubing and connectors

2.5 ANCHOR BOLTS

A. Equipment manufacturer shall furnish all anchor bolts of ample size and strength required to securely anchor each item of equipment. Anchor bolts shall be wedge or epoxy type.

B. Anchor bolts shall be set by the Installation Contractor or Owner. Equipment shall be placed on the foundations, leveled, shimmed, bolted down, and grouted with a non-shrinking grout.

2.6 MANUFACTURER, OR EQUAL

A. Huber Technology, Inc., RPPS PRO-1400-3

B. Equal must be approved during bidding process.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING OF EQUIPMENT

A. All equipment shall be shipped and delivered fully assembled, except where partial disassembly is required in order to conform to transportation regulations or for the protection of components.

B. The Installation Contractor or Owner shall be responsible for unloading of the machinery and shall have equipment on-site available at the time of delivery permitting proper hoisting of the equipment.

3.2 FIELD PREPARATION AND PAINTING

A. The Vendor shall touch-up all shipping damage to the paint and stainless steel as soon as the equipment arrives on the job site.

B. The Vendor shall supply paint for field touch-up and field painting.

C. Prior to assembly all stainless steel bolts and nut threads, the Installation Contractor or Owner shall coat them with a non-seizing compound provided by the Vendor.

3.3 INSTALLATION, START-UP AND OPERATOR TRAINING

A. Vendor shall verify all dimensions in the field to ensure compliance of equipment dimensions with the drawings.

B. Installation of the equipment shall be in strict accordance with the contract documents and the manufacturer's instructions and shop drawings. Manufacturer shall supply anchor bolts for the equipment. Installation Contractor or Owner shall install the anchor bolts in accordance with the manufacturer's recommendations.

C. Perform Level 2 Testing in accordance with Section 43 05 60 – Process Equipment Testing except vibration testing

D. Manufacturer shall furnish the services of a factory-trained service engineer for three (3) trips including six (6) days to inspect the installation, carry-out the equipment start-up procedures, and provide training to the operators in how to effectively operate and maintain the equipment.

1. Equipment shall not be energized, or "bumped" to check the electrical connection for motor rotation without the Service Engineer present.

2. The Service Engineer shall make all necessary adjustments and settings to the controls. In particular, the Service Engineer shall verify the measurement relay setting and the initial water level setting for the screen.

3. The Service Engineer shall demonstrate proper operation of screen and screenings washer. The screen shall operate automatically based on the water level.

END OF SECTION 46 21 35

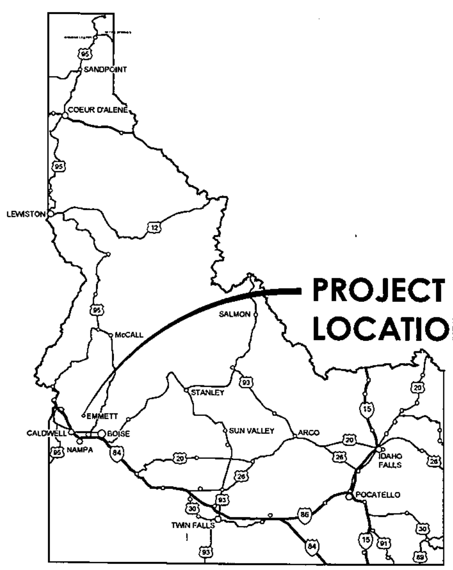
City of

EMMETT, IDAHO

WASTEWATER TREATMENT PLANT

INFLUENT FINE SCREEN

FEBRUARY 2020
VOLUME 2

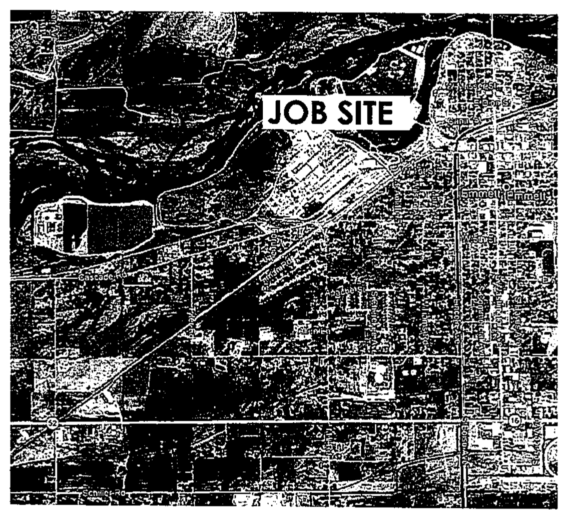


A1 LOCATION MAP
N.T.S.

OWNER
CITY OF EMMETT
601 E 3RD STREET
EMMETT, IDAHO 83617
PHONE: 208 365-9569

CIVIL ENGINEER
KELLER ASSOCIATES, INC.
131 SW 5TH AVE
MERIDIAN, IDAHO 83642
CONTACT: - ERIC ROUNDY, PE, BCEE
PHONE: 208 288-1992

811 Know what's below. Call before you dig.



A3 VICINITY MAP
N.T.S.

KELLER ASSOCIATES

NO. | REVISIONS | DATE

This document or any part herein in detail or design concept is the personal property of Keller Associates, Inc. and shall not be copied in any form without the written authorization of Keller Associates, Inc.

EMMETT WWTP INFLUENT FINE SCREEN

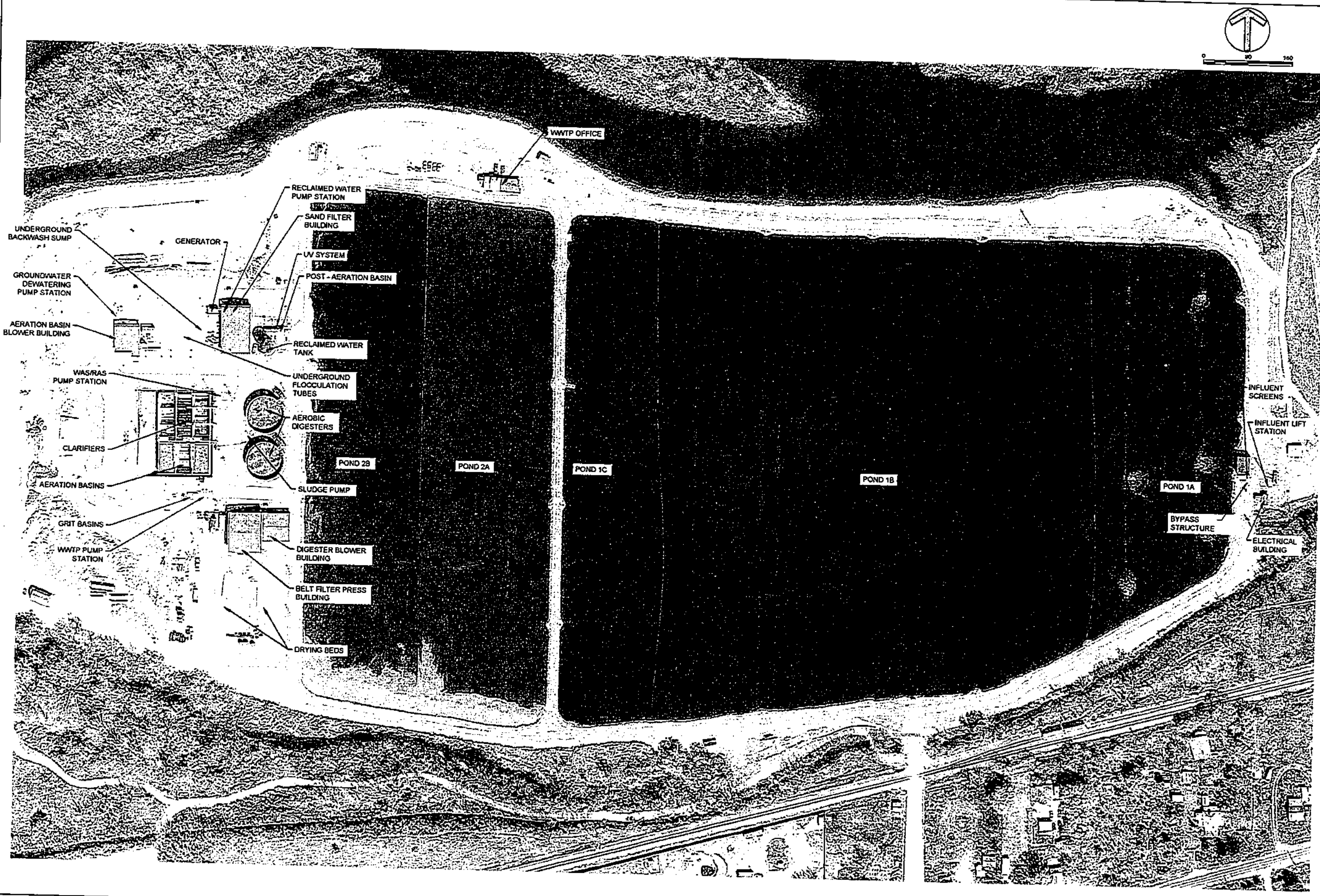
COVER SHEET

DRAWN: — CHECK: —

VERIFY SCALE: Scales based on 22"x34" prints.

PROJECT NO. 210022-051

SHEET NO. G-001



KELLER ASSOCIATES

NO.	REVISIONS	DATE

EMMETT WWTP INFLUENT FINE SCREEN

EXISTING WWTP LAYOUT

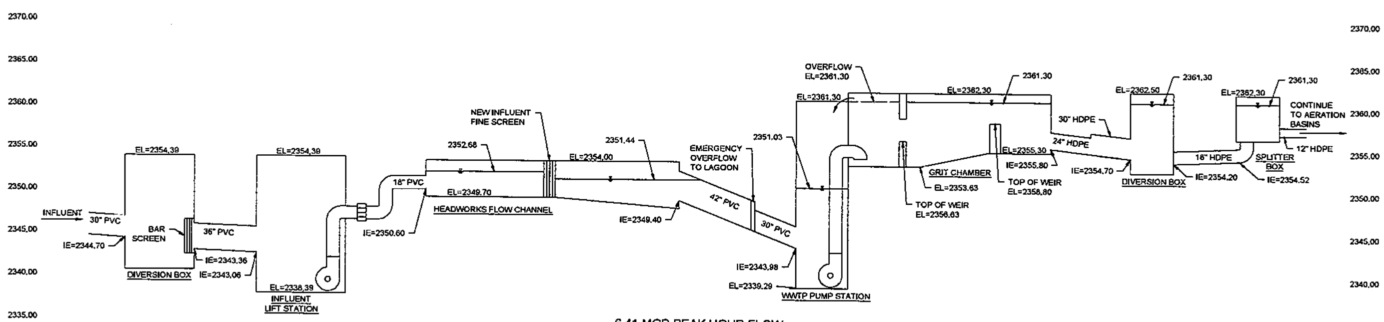
DRAWN: — CHECK: —

VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 inches

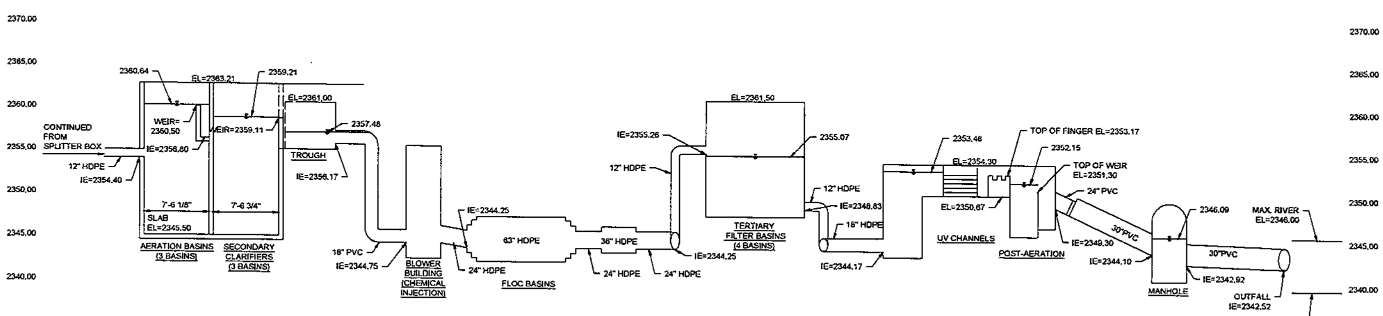
PROJECT NO. 210022-051

SHEET NO. G-002



(B1) HYDRAULIC PROFILE
N.T.S.

6.41 MGD PEAK HOUR FLOW



(A1) HYDRAULIC PROFILE
N.T.S.

6.41 MGD PEAK HOUR FLOW

KELLER ASSOCIATES
131 SW 5th Avenue, Suite A
Meridian, Idaho 83642
(208) 288-1992

NO.	REVISIONS	DATE

EMMETT WWTP INFLUENT FINE SCREEN

EXISTING WWTP HYDRAULIC PROFILE

DRAWN: — CHECK: —

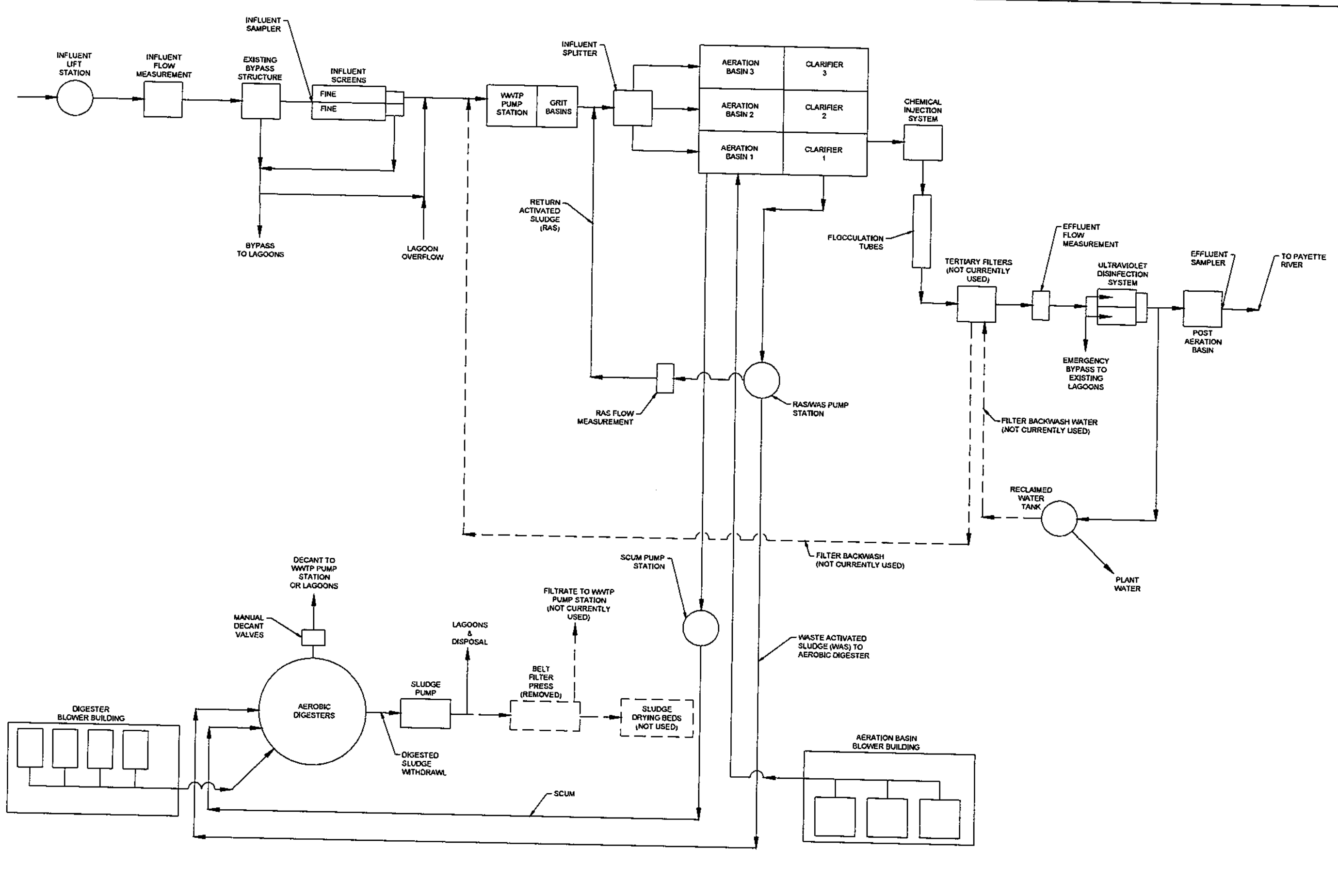
VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 inches

PROJECT NO. 210022-051

PAGE

SHEET NO. G-003



KELLER ASSOCIATES

NO. | REVISIONS | DATE

EMMETT WWTP INFLUENT FINE SCREEN

PROCESS FLOW DIAGRAM

DRAWN: — CHECK: —

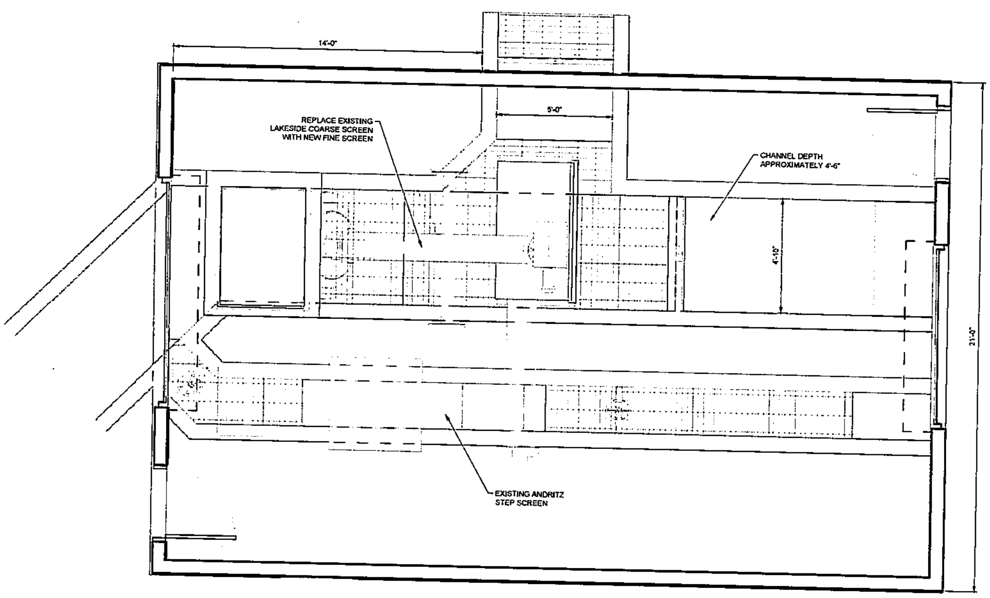
VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 Inches

PROJECT NO. 210022-051

PAGE

SHEET NO. G-004



NOTE:
MANUFACTURER TO VERIFY DIMENSIONS PRIOR TO EQUIPMENT SUBMITTAL

(A1) FLOOR PLAN
N.T.S.

KELLER ASSOCIATES
131 SW 5th Avenue, Suite A
Meridian, Idaho 83642
(208) 288-1992

NO.	REVISIONS	DATE

EMMETT WWTP INFLUENT FINE SCREEN

EXISTING WWTP LAYOUT

DRAWN: — CHECK: —

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 inches

PROJECT NO. 210022-051
PAGE

SHEET NO. G-006

P:\210022\051-WWTP INFLUENT SCREENING_DESN_CAD\2_PRELIMD_PLANS\101_GEN\G-006.DWG LAST SAVED: 2/21/2020 3:14 PM PRINTED: 2/21/2020 3:28 PM

NOTICE OF AWARD

Date of Issuance:	03/17/2020	
Owner:	City of Emmett 601 E. 3rd St. Emmett, ID 83617	
Engineer:	Keller Associates 131 SW 5th Ave., Meridian, ID 83642	Engineer's Project No.: 210022-051
Project:	WWTP Influent Fine Screen	
Bidder:	Huber Technology	
Bidder's Address:	1009 Airlie Parkway Denver, NC 28037	

TO BIDDER:

You are notified that Owner has accepted your Bid dated March 12, 2020 for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

City of Emmett WWTP Influent Fine Screen, as detailed in Contract Documents and Specifications.

The Contract Price of the awarded Contract is: $ 178,500.00

Two (2) unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award or has been transmitted or made available to Bidder electronically.

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

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

1. Deliver to Owner two (2) counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security (Performance and Payment Bonds) and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.

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

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

Owner: City of Emmett

Authorized Signature

By:

Title:

Copy: Engineer

Doricela Millan-Sotelo

From: Doricela Millan-Sotelo
Sent: Monday, March 16, 2020 12:01 PM
To: Public Works Distro List
Subject: FW: Invitation to Bid- City of Emmett fine screen project

From: Jim R. Aitkenhead [mailto:jra@lakeside-equipment.com]
Sent: Wednesday, March 11, 2020 10:44 AM
To: Andrew Abercrombie
Subject: RE: Invitation to Bid- City of Emmett fine screen project

Andrew,

Thank you for the opportunity. We respectfully decline to bid the Emmett fine screen project. We do not feel we could 100% meet the specifications.

Sincerely,

Jim R. Aitkenhead
Regional Sales Manager
T: 630/837-5640 x 230 | F: 630/837-5647

From: Andrew Abercrombie [mailto:aabercrombie@cityofemmett.org]
Sent: Wednesday, February 26, 2020 10:16 AM
To: awilliams@westech-inc.com; munisales@westech-inc.com; Jim R. Aitkenhead; john@hhusa.net; shay.campbell@hhusa.net
Cc: Clint Seamons; Doricela Millan-Sotelo
Subject: Invitation to Bid- City of Emmett fine screen project

Good morning,

Attached is the bid specifications for the city of Emmett WWTP fine screen project, it can also be found at the following drop box- https://www.dropbox.com/sh/dow4l0eifle3ni7/AACrCQ97VkX3Mb72MOwHuhJwa?dl=0

All Bids are due by March 12th at midnight.

Please submit bids to Andrew Abercrombie at aabercrombie@cityofemmett.org and also Cc.. publicworks@cityofemmett.org

If you have any qustions, please contact me.

Thanks,
Andrew Abercrombie
City of Emmett
WWTP Manager
208-573-7627

Doricela Millan-Sotelo

From: Doricela Millan-Sotelo
Sent: Monday, March 16, 2020 12:00 PM
To: Public Works Distro List
Subject: FW: 1960755 City of Emmett fine screen project - Bid Date 3/12

From: Todd CAMPBELL [mailto:TCAMPBELL@westech-inc.com]
Sent: Monday, March 2, 2020 11:33 AM
To: Andrew Abercrombie
Cc: Ryan Spanton; Amanda MARTIN; Eric DISANTIS; Michael ATKINS; Mike GITZENDANNER; Peter LARSON; Karen HURLEY; Muni Sales; Adrian WILLIAMS
Subject: RE: 1960755 City of Emmett fine screen project - Bid Date 3/12

Mr. Abercombie

Thank you for your invitation for WesTech Engineering to bid the screen for the City of Emmett. Unfortunately the WesTech unit will not meet your specifications and therefore we must decline the invitation.

If you have any questions, please contact me at 847.775.2403

Regards,

Todd Campbell
Applications Engineer
WesTech Engineering Inc.
O: 847.775.2401 D: 847.775.2403
F: 847.249.4166 Skype: tcampbell6441
1486 St Paul Ave | Gurnee | Illinois | 60031

WESTECH

From: Andrew Abercrombie <aabercrombie@cityofemmett.org>
Sent: Wednesday, February 26, 2020 9:16 AM
To: Adrian WILLIAMS <AWILLIAMS@westech-inc.com>; Muni Sales <munisales@westech-inc.com>; jra@lakeside-equipment.com; john@hhusa.net; shay.campbell@hhusa.net
Cc: Clint Seamons <cseamons@cityofemmett.org>; Doricela Millan-Sotelo <dmillan-sotelo@cityofemmett.org>
Subject: Invitation to Bid- City of Emmett fine screen project

Good morning,

Attached is the bid specifications for the city of Emmett WWTP fine screen project, it can also be found at the following drop box- https://www.dropbox.com/sh/dow4l0eifle3ni7/AACrCQ97VkX3Mb72MOwHuhJwa?dl=0

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Please submit bids to Andrew Abercrombie at aabercrombie@cityofemmett.org and also Cc.. publicworks@cityofemmett.org

If you have any qustions, please contact me.

Thanks,
Andrew Abercrombie
City of Emmett
WWTP Manager
208-573-7627