

PROJECT MANUAL

CITY OF MARINE CITY
ST CLAIR COUNTY, MI



WATER SYSTEM IMPROVEMENTS
CONTRACT 2 – WATER TREATMENT PLANT IMPROVEMENTS
DWSRF PROJECT NUMBER 7852-01

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ADVERTISEMENT FOR BIDS

**City of Marine City
Water System Improvements
Contract 2 – Water Treatment Plant Improvements**

City of Marine City is requesting Bids for the construction of Water System Improvements, Contract 2 – Water Treatment Plant Improvements. Bids for the construction of the project will be received at the Marine City City Hall located at 260 South Parker Street, Marine City, MI 48039, until **11:00 a.m.** local time, **June 26, 2024**. At that time the Bids received will be publicly and read.

The project includes rehabilitation of all three filters including replacement of underdrains, media, and surface wash equipment, replacement of low service pumps, installation of rapid mixer, pipe and valve replacement, tank coating, concrete repairs, installation of a mixer in the City's elevated storage tank, and electrical and control improvements.

Prospective Bidders may request the Bidding Documents from the Issuing Office. The Issuing Office of the Bidding Documents is: Fleis & VandenBrink Engineering, 27725 Stansbury Boulevard, Suite 195, Farmington Hills, MI 48334: email: bidroom@fveng.com Telephone (248) 536-0080. Bidding Documents will be emailed in portable document format (PDF) at no charge; hard copy documents are not available. Non-biddable documents may be viewed in the on-line Bid Room at www.fveng.com.

The date the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder's date of receipt of the Bidding Documents.

A pre-bid conference for the project will be held on Thursday, June 6, 2024 at 11:00 am at the Marine City City Hall located at 260 South Parker Street, Marine City, MI 48039. Attendance at the pre-bid conference is encouraged but not required.

This project is subject to prevailing wages.

Prospective Bidders must solicitate or advertise for each subcontract in at least one statewide publication. An example statewide public is Michigan Infrastructure and Transportation Association (MITA) (www.mitaads.com).

Prospective Bidders must complete the Good Faith Efforts Worksheet for each subcontractor and submit documentation with the bid.

1. Separate worksheets must be provided for each area of work to be subcontracted out. This includes both major and minor subcontracts.
2. A minimum of three (3) DBEs must be contacted by a verifiable means of communication such as email, letter, or fax for each area of work to be subcontracted out. Copies of the solicitation letters/emails and fax confirmation sheets must be provided with the worksheet.
3. If less than three (3) DBEs exist statewide for the area of work, then provide documentation that other DBE resources were consulted. This may include the MDOT and www.sam.gov registries and an advertisement in a publication. A printout of the website searched (conducted prior to the end of the bid period) must be submitted with the bid.
4. Failure to comply with above items may result in an invalid bid.

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

This work is being performed in accordance with and funded through an EGLE Drinking Water State Revolving Fund (DWSRF) program.

The City of Marine City reserves the right to accept any bid, reject any or all bids, to waive informalities and make the award in any manner deemed in the best interest of the City of Marine City.

City of Marine City

Scott Adkins

City Manager

END OF SECTION

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - DEFINED TERMS

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

ARTICLE 2 - BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for Plan Holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Owner may establish a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner requires that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered Plan Holders will receive Addenda issued by Owner.
- 2.04 Bidders registered as a plan holder can obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered Plan Holders will receive Addenda issued by Owner.
- 2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) will make the Bidding Documents available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are required to register as Plan Holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.06 *Electronic Documents*

- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
 - 1. Bidding Documents will be provided in Portable Document Format (.pdf). It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.
- B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within five days of Owner's request, Bidder must submit the following information:
 - A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.
 - B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.
 - C. Bidder's state or other contractor license number, if applicable.
 - D. Subcontractor and Supplier qualification information.
 - E. Other required information regarding qualifications.
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4 - PRE-BID CONFERENCE

- 4.01 A non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or invitation to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.

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

5.01 *Site and Other Areas*

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

5.02 *Existing Site Conditions*

- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
 - a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
 - b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
 - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
 2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
 3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
 4. *Geotechnical Baseline Report/Geotechnical Data Report*: The Bidding Documents contain a Geotechnical Baseline Report (GBR) and Geotechnical Data Report (GDR).
 - a. As set forth in the Supplementary Conditions, the GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GBR is a Contract Document.
 - b. The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.
 - c. Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.
 - d. As set forth in the Supplementary Conditions, the GDR is a Contract Document containing data prepared by or for the Owner in support of the GBR.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

- A. In addition to the documents regarding existing Site conditions referred to in Paragraph 5.02.A, record drawings at or adjacent to the Site are known to Owner and made available to Bidders for reference. Owner will make copies of these other Site-related documents available to any Bidder on request.
- B. Owner has not verified the contents of these other Site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.
- C. The other Site-related documents are not part of the Contract Documents.
- D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.
- E. No other Site-related documents are available.

5.04 *Site Visit and Testing by Bidders*

- A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
- B. If a pre-bid conference is held, a Site visit may be held immediately following the conference.
- C. Bidder may conduct a Site visit on publicly available lands at Bidders convenience.
- D. Bidder may request a Site visit on private property and restricted areas during normal working hours.
- E. Bidders visiting the Site are required to arrange their own transportation to the Site.
- F. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- G. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

- H. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- I. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

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

5.06 *Other Work at the Site*

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

ARTICLE 6 - BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

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

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

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

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

ARTICLE 8 - BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5% of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9 - CONTRACT TIMES

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

ARTICLE 10 - SUBSTITUTE AND "OR-EQUAL" ITEMS

- 10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or-equal" or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner.
- 10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as

supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

ARTICLE 11 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 11.02 If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 11.03 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

ARTICLE 12 - PREPARATION OF BID

- 12.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
- B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.
- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.
- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

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

ARTICLE 13 - BASIS OF BID

13.01 *Lump Sum*

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

13.02 *Unit Price*

- A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

13.03 *Allowances*

- A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash

allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14 - SUBMITTAL OF BID

- 14.01 The Bidding Documents include the Bid Form, and, if required, the Bid Bond Form. The Bid Form is to be printed, completed, and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.
- 14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15 - MODIFICATION AND WITHDRAWAL OF BID

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

ARTICLE 16 - OPENING OF BID

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

ARTICLE 17 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 18 - EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.
- 18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.
- 18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.
- 18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.
- 18.05 *Evaluation of Bids*
- A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19 - BONDS AND INSURANCE

- 19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.
- 19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20 - SIGNING OF THE AGREEMENT

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

END OF SECTION

SECTION 00 41 00

BID FORM

ARTICLE 1 - OWNER & BIDDER

- 1.01 This Bid is submitted to: **City of Marine City
260 South Parker Street
Marine City, MI 48039**
- 1.02 Name of Project: **Water System Improvements
Contract 2 – Water Treatment Plant Improvements**
- 1.03 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - ATTACHMENTS TO THIS BID

- 2.01 The following documents are submitted with and made a condition of this Bid.
- A. Required Bid security;
 - B. Evidence of authority to do business in the state of Michigan; or a written covenant to obtain such authority within the time for acceptance of Bids;
 - C. Disadvantaged Business Enterprises (DBE)
 - 1. Good Faith Efforts Worksheet
 - D. Certification Regarding Debarment, Suspension, and Other Responsibility Matters.

ARTICLE 3 - BASIS OF BID

- 3.01 Lump Sum:
- A. Bidder will complete the Work in accordance with the Contract Documents for the following lump sum (stipulated) price(s), together with any Unit Prices indicated in Paragraph 3.02:
 - 1. Lump Sum Prices:

Total Lump Sum Bid:	\$ _____ (use figures)
----------------------------	------------------------

- B. All specified cash allowance(s) are included in the price(s) set forth below and have been computed in accordance with Paragraph 13.02 of the General Conditions.

Owner's Systems Integrator (Refer to Section 26 05 00)	\$40,000.00
Total for all Lump Sum for Cash Allowances	\$40,000.00

Note: Refer to Section 01 21 13 – Cash Allowances for descriptions of allowances.

3.02 Unit Price Bids:

- A. Bidder will perform the following Work at the indicated unit prices:

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
1	Concrete repairs, Type A	LF	100	\$	\$
2	Concrete repairs, Type B	SF	25	\$	\$
3	Concrete repairs, Type C	CF	20	\$	\$
4	Concrete repairs, Type D	LF	100	\$	\$
5	Concrete repairs, Type E	SF	10	\$	\$
6	Concrete repairs, Type F	CF	10	\$	\$
Total of All Unit Price Bid Items:					\$

- B. Bidder acknowledges that:

- Each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
- Estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

3.03 Total Bid Price (Lump Sum and Unit Prices):

Total Bid Price (Total of all Lump Sum, Allowances, and Unit Price Bids) [3.01.A.1. plus 3.01.B. plus 3.02.A.]	\$
---	----

ARTICLE 4 - TIME OF COMPLETION

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

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

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

5.01 *Bid Acceptance Period*

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

5.02 *Instructions to Bidders*

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

5.03 *Receipt of Addenda*

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

Addendum Number	Addendum Date

5.04 *Subcontractor and Supplier List:*

- A. Bid is submitted on the basis of the use of the following Subcontractors

WORK ITEM	FIRM	CITY
Excavation Subcontractor		
Concrete Rehabilitation Subcontractor		
Coating Subcontractor		
Mechanical Subcontractor		
Electrical Subcontractor		
Filter Equipment Supplier		
Pump Supplier		
Rapid Mixer Supplier		

ARTICLE 6 - BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

- A. In submitting this Bid, Bidder represents the following:
 - 1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
 - 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 - 5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in

the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

6.02 Bidder's Certifications

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
 - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
 - d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

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

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

Address for giving notices:

Bidder's Contact:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address: _____

Bidder's Contractor License No.: (if applicable) _____

END OF SECTION

SECTION 00 43 13

BID BOND

<p>Bidder</p> <p>Name: [Full formal name of Bidder]</p> <p>Address (<i>principal place of business</i>): [Address of Bidder's principal place of business]</p>	<p>Surety</p> <p>Name: [Full formal name of Surety]</p> <p>Address (<i>principal place of business</i>): [Address of Surety's principal place of business]</p>
<p>Owner</p> <p>Name: City of Marine City</p> <p>Address (<i>principal place of business</i>): 260 South Parker Street Marine City, MI 48039</p>	<p>Bid</p> <p>Project (<i>name and location</i>): Water System Improvements Contract 2 – Water Treatment Plant Improvements DWSRF #7852-01</p> <p>Bid Due Date: June 26, 2024</p>
<p>Bond</p> <p>Penal Sum: [Amount]</p> <p>Date of Bond: [Date]</p>	
<p>Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.</p>	
<p>Bidder</p> <hr/> <p align="center"><i>(Full formal name of Bidder)</i></p>	<p>Surety</p> <hr/> <p align="center"><i>(Full formal name of Surety) (corporate seal)</i></p>
<p>By: _____</p> <p align="center"><i>(Signature)</i></p>	<p>By: _____</p> <p align="center"><i>(Signature) (Attach Power of Attorney)</i></p>
<p>Name: _____</p> <p align="center"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p align="center"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p>Attest: _____</p> <p align="center"><i>(Signature)</i></p>	<p>Attest: _____</p> <p align="center"><i>(Signature)</i></p>
<p>Name: _____</p> <p align="center"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p align="center"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p><i>Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.</i></p>	

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

SECTION 00 45 46

GOVERNMENTAL CERTIFICATIONS AND DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section provides for inclusion of various governmental certifications and forms into the Contract Documents.

1.02 State of Michigan Drinking Water State Revolving Fund (DWSRF) attached documents:

- A. BABA – Build America, Buy America Contract Language
- B. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment
- C. Davis-Bacon/Prevailing Federal Wage Rates
 - 1. Minimum Wage Rates
- D. 29 CFR Part 5 – Labor Standards Provisions for Federally Assisted Projects
- E. Disadvantaged Business Enterprises (DBE)
 - 1. Good Faith Efforts Worksheet
 - 2. Instruction to Bidders for the Completion of the Good faith Efforts worksheet.
 - 3. Disadvantaged Business Enterprise (DBE) Requirements Frequently asked Questions Regarding Contractor Compliance.
- F. Certification Regarding Debarment, Suspension, and Other Responsibility Matters.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION



MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
Finance Division

EQUIVALENCY PROJECTS CONTRACT BOILERPLATE LANGUAGE

Instructions:

The following is the required standard contract language that must appear in bidding documents of Clean Water State Revolving Fund and Drinking Water State Revolving Fund equivalency projects. Determination of equivalent vs. non-equivalent projects is made on a yearly basis as indicated in the Intended Use Plan (IUP) and will be communicated by your EGLE project manager. If you are unsure whether your project is equivalent, consult with your EGLE project manager.

- **Domestic Preference Requirements** **Project is BABA eligible. AIS not applicable.**
 - All projects must comply with federal domestic preference requirements. For equivalency projects this means compliance with Build America, Buy America (BABA) requirements unless a waiver is received, then the project must comply with existing American Iron and Steel (AIS) requirements. Only either [BABA Contract Language](#) or [AIS Contract Language](#) should appear in the bidding documents, not both.
- [Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment](#)
- [Davis-Bacon and Related Acts/Prevailing Federal Wages](#)
- [Labor Standards Provisions for Federally Assisted Projects](#)
- [Disadvantaged Business Enterprise \(DBE\) Requirements](#)
- [Good Faith Efforts \(GFE\) Worksheet*](#)
- [Certification Regarding Debarment, Suspension, and Other Responsibility Matters*](#)

*Bidders should note these sections contain instructions regarding forms/information that must be completed and included with any submitted bid.

If you need this information in an alternate format, contact EGLE-Accessibility@Michigan.gov or call 800-662-9278.

EGLE does not discriminate on the basis of race, sex, religion, age, national origin, color, marital status, disability, political beliefs, height, weight, genetic information, or sexual orientation in the administration of any of its programs or activities, and prohibits intimidation and retaliation, as required by applicable laws and regulations. Questions or concerns should be directed to the Nondiscrimination Compliance Coordinator at EGLE-NondiscriminationCC@Michigan.gov or 517-249-0906.

Build America, Buy America Contract Language

The Contractor acknowledges to and for the benefit of the City of Marine City (“Owner”) and the Michigan Department of Environment, Great Lakes, and Energy (the “Funding Authority”) that it understands the goods and services under this Agreement are being funded with federal monies and have statutory requirements commonly known as “Build America, Buy America;” that requires all of the iron and steel, manufactured products, and construction materials used in the project to be produced in the United States (“Build America, Buy America Requirements”) including iron and steel, manufactured products, and construction materials provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Owner and Funding Authority (a) the Contractor has reviewed and understands the Build America, Buy America Requirements, (b) all of the iron and steel, manufactured products, and construction materials used in the project will be and/or have been produced in the United States in a manner that complies with the Build America, Buy America Requirements, unless a waiver of the requirements is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the Build America, Buy America Requirements, as may be requested by the Owner or the Funding Authority. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Owner or Funding Authority to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Owner or Funding Authority resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the Funding Authority or any damages owed to the Funding Authority by the Owner). If the Contractor has no direct contractual privity with the Funding Authority, as a lender or awardee to the Owner for the funding of its project, the Owner and the Contractor agree that the Funding Authority is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the Funding Authority.

Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment

The Contractor acknowledges to and for the benefit of the City of Marine City (“Owner”) and the Michigan Department of Environment, Great Lakes, and Energy (the “Funding Authority”) that it understands:

This term and condition implements 2 CFR 200.216 and is effective for obligations and expenditures of the U.S. Environmental Protection Agency (or EPA)’s financial assistance funding on or after 8/13/2020.

As required by 2 CFR 200.216, EPA recipients and subrecipients, including borrowers under EPA funded revolving loan fund programs, are prohibited from obligating or expending loan or grant funds to procure or obtain; extend or renew a contract to procure or obtain; or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115-232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities). Recipients, subrecipients, and borrowers also may not use EPA funds to purchase:

- a. For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
- b. Telecommunications or video surveillance services provided by such entities or using such equipment.
- c. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

Consistent with 2 CFR 200.471, costs incurred for telecommunications and video surveillance services or equipment such as phones, internet, video surveillance, and cloud servers are allowable except for the following circumstances:

- a. Obligating or expending EPA funds for covered telecommunications and video surveillance services or equipment or services as described in 2 CFR 200.216 to:
 - (1) Procure or obtain, extend or renew a contract to procure or obtain;
 - (2) Enter into a contract (or extend or renew a contract) to procure; or
 - (3) Obtain the equipment, services, or systems. Certain prohibited equipment, systems, or services, including equipment, systems, or services produced or provided by entities identified in section 889, are recorded in the System for Award Management exclusion list.

Davis-Bacon and Related Acts/Prevailing Federal Wages

P.L. 111-88 requires compliance with the Davis Bacon Act and adherence to the current U.S. Department of Labor Wage Decision. Attention is called to the fact that not less than the minimum salaries and wages as set forth in the Contract Documents (see Wage Decision included herein) must be paid on this project. The Wage Decision, including modifications, must be posted by the Contractor on the job site. The “Contracting Agency” or “Contracting Officer” for Davis-Bacon Wage Decision posters on jobsites is the loan applicant/bond issuer. A copy of the Labor Standards Provisions for Federally Assisted Projects is included and is hereby a part of this contract.

"General Decision Number: MI20240072 04/05/2024

Superseded General Decision Number: MI20230072

State: Michigan

Construction Type: Heavy

County: St Clair County in Michigan.

Heavy, Includes Water, Sewer Lines and Excavation (Excludes Hazardous Waste Removal; Coal, Oil, Gas, Duct and other similar Pipeline Construction)

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

* BOIL0169-003 01/01/2024

	Rates	Fringes
BOILERMAKER.....	\$ 39.65	35.68

CARP0687-008 06/01/2023

	Rates	Fringes
CARPENTER, Includes Form Work....	\$ 38.48	30.22
PILEDRIVERMAN.....	\$ 34.20	28.82

ELEC0017-003 06/01/2023

	Rates	Fringes
LINE CONSTRUCTION: Linemen/Cable Splicer.....	\$ 52.02	7.20+29%

ELEC0058-007 06/28/2022

	Rates	Fringes
ELECTRICIAN.....	\$ 48.52	26.11

ENGI0325-019 09/01/2023

POWER EQUIPMENT OPERATORS: Underground Construction (Including Sewer)

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 41.08	25.25
GROUP 2.....	\$ 36.25	25.25
GROUP 3.....	\$ 35.52	25.25
GROUP 4.....	\$ 34.95	25.25

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Backhoe/ Excavator, Boring Machine, Bulldozer, Crane, Grader/ Blade, Loader, Roller, Scraper, Trencher (over 8 ft. digging capacity)

GROUP 2: Trencher (8-ft digging capacity and smaller)

GROUP 3: Boom Truck (non-swinging, non- powered type boom)

GROUP 4: Broom/ Sweeper, Fork Truck, Tractor, Bobcat/ Skid Steer /Skid Loader

ENGI0326-008 06/01/2023

EXCLUDES UNDERGROUND CONSTRUCTION

	Rates	Fringes
OPERATOR: Power Equipment		
GROUP 1.....	\$ 47.79	25.35
GROUP 2.....	\$ 46.29	25.35

GROUP 3.....	\$ 44.79	25.35
GROUP 4.....	\$ 44.49	25.35
GROUP 5.....	\$ 43.67	25.35
GROUP 6.....	\$ 42.81	25.35
GROUP 7.....	\$ 41.84	25.35
GROUP 8.....	\$ 40.13	25.35
GROUP 9.....	\$ 31.79	25.35

FOOTNOTES: Tower cranes: to be paid the crane operator rate determined by the combined length of the mast and the boom.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Crane with boom & jib or leads 400' or longer

GROUP 2: Crane with boom & jib or leads 300' or longer

GROUP 3: Crane with boom & jib or leads 220' or longer

GROUP 4: Crane with boom & jib or leads 140' or longer

GROUP 5: Crane with boom & jib or leads 120' or longer

GROUP 6: Regular crane operator

GROUP 7: Backhoe/Excavator, Bobcat/Skid Loader, Boring Machine, Broom/Sweeper, Bulldozer, Grader/Blade, Loader, Roller, Scraper, Tractor, Trencher

GROUP 8: Forklift

GROUP 9: Oiler

IRON0025-006 06/01/2023

	Rates	Fringes
IRONWORKER		
Reinforcing.....	\$ 31.43	34.77
Structural.....	\$ 34.85	40.42

LAB00334-009 06/01/2023

EXCLUDES OPEN CUT CONSTRUCTION

	Rates	Fringes
Landscape Laborer		
GROUP 1.....	\$ 25.97	8.60
GROUP 2.....	\$ 23.75	8.60

LANDSCAPE LABORER CLASSIFICATIONS

GROUP 1: Landscape specialist, including air, gas and diesel equipment operator, lawn sprinkler installer and skidsteer (or equivalent)

GROUP 2: Landscape laborer: small power tool operator, material mover, truck driver and lawn sprinkler installer tender

LAB00334-015 09/01/2022

SCOPE OF WORK:

OPEN CUT CONSTRUCTION: Excavation of earth and sewer, utilities, and improvements, including underground piping/conduit (including inspection, cleaning, restoration, and relining)

	Rates	Fringes
LABORER		
(1) Common or General.....	\$ 23.39	13.15
(2) Mason Tender-Cement/Concrete.....	\$ 23.53	13.15
(4) Grade Checker.....	\$ 23.70	13.15
(5) Pipelayer.....	\$ 23.84	13.52
(7) Landscape.....	\$ 18.29	12.85

LAB01075-005 06/01/2023

EXCLUDES OPEN CUT CONSTRUCTION

	Rates	Fringes
LABORER		
Common or General; Grade Checker; Mason Tender - Cement/Concrete; Pipelayer..	\$ 30.51	17.59

PAIN1474-003 06/01/2010

	Rates	Fringes
PAINTER		
Brush & Roller.....	\$ 23.79	12.02
Spray.....	\$ 24.79	12.02

PLAS0514-005 06/01/2023

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 32.23	22.11

PLUM0098-005 06/01/2019

	Rates	Fringes
PLUMBER.....	\$ 35.77	35.13

PLUM0636-002 06/05/2017

	Rates	Fringes
PIPEFITTER.....	\$ 40.41	29.35

TEAM0007-008 06/01/2023

	Rates	Fringes
TRUCK DRIVER		
Dump Truck under 8 cu. yds.; Tractor Haul Truck....	\$ 31.30	.75 + a+b
Dump Truck, 8 cu. yds. and over.....	\$ 31.40	.75 + a+b
Lowboy/Semi-Trailer Truck....	\$ 31.55	.75 + a+b

FOOTNOTE:

- a. \$470.70 per week.
- b. \$68.70 daily.

 SUMI2010-070 11/09/2010

	Rates	Fringes
TRUCK DRIVER: Off the Road		
Truck.....	\$ 20.82	3.69

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number,

005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this

initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

Labor Standards Provisions for Federally Assisted Projects - 29 CFR Part 5

§5.5 Contract provisions and related matters.

(a) The Agency head shall cause or require the contracting officer to insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in Sec. 5.1, the following clauses (or any modifications thereof to meet the particular needs of the agency, *Provided*, That such modifications are first approved by the Department of Labor):

(1) *Minimum wages.* (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in Sec. 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination, and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (C) In the event the contractor, the laborers, or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- (iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside, in a separate account, assets for the meeting of obligations under the plan or program.
- (2) *Withholding.* The **(write in name of Federal Agency or the loan or grant recipient)** shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the

work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

- (3) *Payrolls and basic records.* (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency). The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead, the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at dol.gov/agencies/whd/government-contracts/construction/forms or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

- (B) Each payroll submitted shall be accompanied by a "Statement of Compliance", signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (1) That the payroll for the payroll period contains the information required to be provided under Sec. 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under Sec. 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete.
 - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
 - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Michigan Department of Environment, Great Lakes, and Energy or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as maybe necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.
- (4) *Apprentices and trainees-* (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the

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

- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.
- (5) *Compliance with Copeland Act requirements.* The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

- (6) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the (write in the name of the Federal agency) may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
- (7) *Contract termination: debarment.* A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- (8) *Compliance with Davis-Bacon and Related Act requirements.* All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (9) *Disputes concerning labor standards.* Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.
- (10) *Certification of eligibility.* (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C.1001.
- (b) *Contract Work Hours and Safety Standards Act.* The Agency Head shall cause or require the contracting officer to insert the following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Sec. 5.5(a) or 4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.
- (1) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible there for shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be

liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

- (3) Withholding for unpaid wages and liquidated damages. The ***(write in the name of the Federal agency or the loan or grant recipient)*** shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.
- (c) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in Sec.5.1, the Agency Head shall cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Agency Head shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the Michigan Department of Environment, Great Lakes, and Energy and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

Disadvantaged Business Enterprises (DBE) Requirements

Prime contractors bidding on this project must follow, document, and maintain documentation of their Good Faith Efforts (GFE), as listed below, to ensure that Disadvantaged Business Enterprises (DBEs) have the opportunity to participate in the project by increasing DBE awareness of procurement efforts and outreach. Bidders must make the following Good Faith Efforts for any work that will be subcontracted.

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. Place DBEs on solicitation lists and solicit DBEs whenever they are potential sources.
2. Make information on forthcoming opportunities available to DBEs. Arrange timeframes for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. Whenever possible, post solicitation for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date. The DBEs should be given a minimum of 5 days to respond to the posting.
3. Consider in the contracting process whether firms competing for large contracts can be subcontracted with DBEs. Divide total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
4. Encourage contracting with a consortium of DBEs when a contract is too large for one DBE firm to handle individually.
5. Use the services and assistance of the Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce.

Subsequent to compliance with the Good Faith Efforts, the following conditions also apply under the DBE requirements. Completed Good Faith Efforts Worksheets, along with the required supporting documentation outlined in the instructions, must be submitted with your bid proposal. EPA form 6100-2 must also be provided at the pre-bid meeting. A copy of this form is available on the Forms and Guidance page of the EGLE Water Infrastructure Financing Section website.

1. The prime contractor must pay its subcontractor for work that has been satisfactorily completed no more than 30 days from the prime contractor's receipt of payment from the owner.
2. The prime contractor must notify the owner in writing prior to the termination of any DBE subcontractor for convenience by the prime contractor and employ the Good Faith Efforts if soliciting a replacement contractor.
3. If a DBE contractor fails to complete work under the subcontract for any reason, the prime contractor must employ the Good Faith Efforts if soliciting a replacement contractor.
4. The prime contractor must employ the Good Faith Efforts.

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Good Faith Efforts Worksheet

Bidder: _____

Subcontract Area of Work (one per worksheet): _____

Outreach Goal: Solicit a minimum of three (3) DBEs via email/letter/fax. It is recommended that various sources be used to locate the minimum number of DBEs. The Michigan Department of Transportation (MDOT) website and www.sam.gov registries may be two resources used to find a minimum of three DBEs.

List the DBEs contacted for the above area of work and complete the following information for each.

Company Name	Contact Method	Date Contacted	Price Quote Received	Accepted or Rejected	If rejected, explain why

Explanation for Not Achieving a Minimum of Three Contacts; you may include a printout of the MDOT and www.sam.gov search results (attach extra sheets if necessary):

MITA DBE Posting Date (if applicable): _____
 (Attach a copy of the DBE advertisement)

Other Efforts (attach extra sheets if necessary):

Please include the completed worksheet and supporting documentation with the bid proposal.

Instructions to Bidders for the Completion of the Good Faith Efforts Worksheet

1. Separate worksheets must be provided for each area of work to be subcontracted out. This includes both major and minor subcontracts.
2. A minimum of three (3) DBEs must be contacted by a verifiable means of communication such as email, letter, or fax for each area of work to be subcontracted out. Copies of the solicitation letters/emails and fax confirmation sheets must be provided with the worksheet.
3. If less than three (3) DBEs exist statewide for the area of work, then provide documentation that other DBE resources were consulted. This may include the MDOT and www.sam.gov registries and an advertisement in a publication. A printout of the website searched (conducted prior to the end of the bid period) must be submitted.
4. Posting solicitations for quotes/proposals from DBEs on the MITA website (www.mitadbe.com) is highly recommended to facilitate participation in the competitive process whenever possible. The solicitation needs to identify the project and the areas of work to be subcontracted out. A copy of the MITA DBE advertisement must be submitted with the Good Faith Efforts worksheet, if used, or a printout of the resulting quotes posted to the MITA website can be submitted with this form as supporting documentation.
5. If the area of work is so specialized that no DBEs exist, then an explanation is required to support that conclusion, including the documentation required in number 3 above.
6. The date of the DBE contact must be identified, as it is important to document that the DBE solicitation was made during the bid period and that sufficient time was given for the DBE to return a quote.
7. Each DBE firm's price quote must be identified if one was received, or N/A entered on the worksheet if a quote was not received. Copies of all quotes must be submitted with the worksheet.
8. If a quote was received, indicate if it was accepted or rejected. Justification for not accepting a quote and not using the DBE subcontractor must be provided.
9. Under Other Efforts, please indicate additional steps you have taken to obtain DBE contractors and provide the appropriate supporting documentation such as:
 - Follow-up emails, faxes, or letters.
 - Copies of announcements/postings in newspapers, trade publications, or minority media that target DBE firms.

Disadvantaged Business Enterprise (DBE) and Good Faith Efforts (GFE) Requirements Frequently Asked Questions Regarding Contractor Compliance

Q: What is the Good Faith Efforts Worksheet and how is it completed?

A: The worksheet captures efforts by the prime contractor to solicit DBEs for each area of work type that will be subcontracted out. A separate GFE Worksheet must be provided by the prime contractor for each area of work type to be subcontracted out. There are specific instructions that accompany the worksheet that prescribe minimum efforts which bidders must make in order to be in compliance with the DBE requirements.

Q: Can non-certified DBEs be used?

A: While non-certified DBEs can be used, only DBEs, MBEs, and WBEs that are certified by EPA, SBA, or MDOT (or by tribal, state and local governments, as long as their standards for certification meet or exceed the standards in EPA policy) can be counted toward the fair share goal. Proof of certification by one of these recognized and approved agencies should be sought from each DBE.

Q: How does a DBE get certified?

A: Applications to be certified by MDOT can be found at

mdotjboss.state.mi.us/MUCPWeb/eligibilityRequirements.htm

To register with the U.S. Small Business Association visit sba.gov/federal-contracting/contracting-assistance-programs/small-disadvantaged-business

To be certified by EPA, a DBE must first have sought certification through SBA, MDOT, or a tribal, state, or local organization and be unsuccessful in that attempt.

Q: If a bidder follows the MDOT DBE requirements, will the bidder comply with the SRF DBE requirements?

A: No. Federally funded highway projects utilize DBE goals, which require a certain percentage of work be performed by DBE subcontractors. For SRF projects, there is no financial goal. However, there is a solicitation effort goal. Bidders must use Good Faith Efforts for each and every area of work to be subcontracted out to obtain DBEs. The bidders are not required to use DBEs if the quotes are higher than non-DBE subcontractors. There is no required DBE participation percentage contract goal for the SRF. However, if the SRF project is part of a joint project with MDOT, the project can be excluded from SRF DBE requirements (i.e., the Good Faith Efforts Worksheet is not required) as it would be difficult to comply with both programs' requirements.

Q: Should the Good Faith Efforts Worksheet and supporting documentation be submitted with bid proposals?

A: Yes. This is a requirement to document that the contractor has complied with the DBE requirements and GFE. These compliance efforts must be done during the bidding phase and not after-the-fact. It is highly recommended that the need for these efforts and the submittal of the forms with the bid proposals be emphasized at the pre-bid meeting. Failure to show that the Good Faith Efforts were complied with during the bidding process can lead to a prime contractor being found non-responsive.

Q: What kinds of documentation should a contractor provide to document solicitation efforts?

A: Documentation can include fax confirmation sheets, copies of solicitation letters/emails, printouts of online solicitations, printouts of online search results, affidavits of publication in newspapers, etc.

- Q:** What if no forms are turned in with the bid proposal or forms are blank or incomplete? Should this be cause to determine that the bidder is non-responsive?
- A:** While the Good Faith Efforts Worksheet is important, it is more critical to confirm that the contractor complied with the DBE requirements prior to bid opening. The owner should contact the bidder as soon as deficiencies are noted for documentation of efforts taken to comply with the DBE requirements. Immediate submittal of the completed forms will be acceptable provided the Good Faith Efforts were made and it is just a matter of transferring information to the forms.
- Q:** How much time will compliance with GFE require in terms of structuring an adequate bidding period?
- A:** Due to the extent of the efforts required, a minimum of 30 calendar days is recommended between bid posting and bid opening to ensure adequate time for contractors to locate certified DBEs and solicit quotes.
- Q:** How does a contractor locate certified DBEs?
- A:** MDOT has a directory of all Michigan certified entities located at mdotjboss.state.mi.us/MUCPWeb/. Additionally, the federal System for Award Management (SAM) is another place to search and can be found at sam.gov. SAM contains information from the former Central Contractor Registration (CCR) database.
- Q:** If the bidder does not intend to subcontract any work, what forms, if any, must be provided with the bid proposal?
- A:** The bidder should complete the Good Faith Efforts Worksheet with a notation that no subcontracting will be done. However, if the bidder is awarded the contract and then decides to subcontract work at any point, then the Good Faith Efforts must be made to solicit DBEs.
- Q:** If the prime contractor is a DBE, does he have to solicit DBE subcontractors?
- A:** Yes, the DBE requirements still apply if the prime intends to subcontract work out. GFE must be used to solicit DBEs.
- Q:** If the area of work is one where there are less than three DBE contractors, how is the contractor to document this?
- A:** Copies of printouts from MDOT and SAM showing no DBEs and advertisements soliciting quotes for all subcontract areas, including the questionable areas, will be adequate if the dates on the printouts are prior to the bid or proposal closing date.

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Certification Regarding Debarment, Suspension, and Other Responsibility Matters

The prime contractor must provide a completed *Certification Regarding Debarment, Suspension, and Other Responsibility Matters Form* with its bid or proposal package to the owner.

The prospective participant certifies, to the best of its knowledge and belief, that it and its principals:

- (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in transactions under federal nonprocurement programs by any federal department or agency;
- (2) Have not, within the three-year period preceding the proposal, had one or more public transactions (federal, state, or local) terminated for cause or default; and
- (3) Are not presently indicted or otherwise criminally or civilly charged by a government entity (federal, state, or local) and have not, within the three-year period preceding the proposal, been convicted of or had a civil judgment rendered against it:
 - (a) For the commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public transaction (federal, state, or local) or a procurement contract under such a public transaction;
 - (b) For the violation of federal or state antitrust statutes, including those proscribing price fixing between competitors, the allocation of customers between competitors, or bid rigging; or
 - (c) For the commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false statements, or receiving stolen property.

I understand that a false statement on this certification may be grounds for the rejection of this proposal or the termination of the award. In addition, under 18 U.S.C. §1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to five years, or both.

Name and Title of Authorized Representative

Name of Participant Agency or Firm

Signature of Authorized Representative

Date

I am unable to certify to the above statement. Attached is my explanation.

SECTION 00 51 00

NOTICE OF AWARD
(on Engineer's Letterhead)

Date of Issuance:

Owner: City of Marine City

Owner's Project No.:

Engineer: Fleis & VandenBrink

Engineer's Project No.: 864261

Project: Water System Improvements

Contract Name: Contract 2 – Water Treatment Plant Improvements

Bidder:

Bidder's Address:

You are notified that Owner has accepted your Bid dated _____ for the above Contract, and that you are the Successful Bidder and are tentatively awarded a Contract for: Water System Improvements, Contract 2 - Water Treatment Plant Improvements. This award is contingent upon the availability of funds and completion of necessary financial arrangements with the Drinking Water State Revolving Fund (DWSRF) program.

(describe Work, alternates, or sections of Work awarded)

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

An electronic counterpart of the Agreement accompanies this Notice of Award and an electronic copy of the Contract Documents will be made available upon request.

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

1. Deliver to Engineer:
 - One pdf formatted counterpart of the Agreement, signed by Bidder (as Contractor).
 - EJCDC *[or other as specified]* Contract Security (Bonds) as specified in the Instructions to Bidders, General Conditions, and Supplementary Conditions.
 - Do not date the bonds. The date will be entered on the bonds after the Agreement is signed by the Owner. This is necessary to ensure the date on the Bonds do not precede the date of the Agreement.
 - Fully dated Bonds will be delivered to the Contractor after the Contract Documents are fully executed.
 - Certificates of Insurance as specified in the General Conditions and Supplementary Conditions.

2. Other conditions precedent (if any): *[Describe other conditions that require Successful Bidder's compliance]*

Electronic signatures (e-signatures) and scanned copies of handwritten signatures are acceptable forms of signatures in the pdf documents.

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.

The information provided will be reviewed, bound into the Contract Documents, submitted to the Owner for signature, and distributed to the appropriate parties.

Sincerely,

[Project Manager]
Fleis & VandenBrink Engineering, Inc.

By: _____
Signature

Title

cc: City of Marine City

END OF SECTION

SECTION 00 52 00

AGREEMENT

This Agreement is by and between **City of Marine City** ("Owner") and _____ ("Contractor").

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

Owner and Contractor hereby agree as follows:

ARTICLE 1 - WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: **Water System Improvements, DWSRF #7852-01**

ARTICLE 2 - THE PROJECT

2.01 Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Contract 2 – Water Treatment Plant Improvements**

ARTICLE 3 - ENGINEER

3.01 The Owner has retained Fleis & VandenBrink Engineering, Inc. ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by Engineer.

ARTICLE 4 - CONTRACT TIMES

4.01 *Time of the Essence*

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

4.02 Contract Times: Days

A. The Work will be substantially complete within 500 days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 530 days after the date when the Contract Times commence to run.

4.03 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion*: Contractor shall pay Owner \$2,000.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
 2. *Completion of Remaining Work*: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$2,000.00 for each day that expires after such time until the Work is completed and ready for final payment.
 3. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.
- B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

ARTICLE 5 - CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract.
- A. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment)
\$_____.

ARTICLE 6 - PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

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

6.02 Progress Payments; Retainage

- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
 - a. 90 percent of the value of the Work completed (with the balance being retainage).
 - 1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage.

Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 Final Payment

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

6.04 *Consent of Surety*

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

6.05 *Interest*

- A. All amounts not paid when due will bear interest at the percent per annum rate 2.0% higher than the Prime Rate on the date of bid opening.

ARTICLE 7 - CONTRACT DOCUMENTS

7.01 *Contents*

- A. The Contract Documents consist of all of the following:
1. This Agreement.
 2. Bonds
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
 3. General Conditions.
 4. Supplementary Conditions.
 5. Specifications as listed in the table of contents of the project manual.
 6. Drawings (not attached but incorporated by reference) consisting of _____ sheets with each sheet bearing the following general title: Water Treatment Plant Improvements.
 7. Addenda (numbers _____ to _____, inclusive).
 8. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid.
 - b. Documentation submitted by Contractor prior to Notice of Award.
 - c. _____.
 9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
- B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.

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

ARTICLE 8 - REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 Contractor's Representations

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:
1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
 2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, if any, with respect to the Technical Data in such reports and drawings.
 5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
 7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
 8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
 9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
 10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
 11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution.
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

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

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

This Agreement will be effective on _____, 20_____ (which is the Effective Date of the Contract).

Owner:

Contractor:

City of Marine City

(typed or printed name of organization)

(typed or printed name of organization)

By:

(individual's signature)

By:

(individual's signature)

Date:

(date signed)

Date:

(date signed)

Name:

(typed or printed)

Name:

(typed or printed)

Title:

(typed or printed)

Title:

(typed or printed)

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

Attest:

(individual's signature)

Attest:

(individual's signature)

Title:

(typed or printed)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address: _____
260 South Parker Street
Marine City, MI 48039

Phone: _____

Email: _____

Address for giving notices:

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address: _____

Phone: _____

Email: _____

License No.: _____
(where applicable)

State: _____

END OF SECTION

SECTION 00 55 00

NOTICE TO PROCEED
(on ENGINEER's letterhead)

Dated _____

Owner: City of Marine City Owner's Project No.: _____
Engineer: Fleis & VandenBrink Engineer's Project No.: 864261
Contractor: _____ Contractor's Project No.: _____
Project: Water System Improvements, DWSRF #7852-01
Contract Name: Contract 2 – Water Treatment Plant Improvements

OWNER's Contract No. _____

On behalf of the City of Marine City, you are hereby notified that the Contract Times under the above Contract will commence to run on _____ pursuant to Paragraph 4.01 of the General Conditions.

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

In accordance with the Agreement:

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

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

Sincerely,
Fleis & VandenBrink Engineering, Inc.

By: _____
Signature

Title

cc: City of Marine City

END OF SECTION

SECTION 00 61 13

PERFORMANCE BOND

<p>Contractor</p> <p>Name: [Full formal name of Contractor]</p> <p>Address (<i>principal place of business</i>): [Address of Contractor's principal place of business]</p>	<p>Surety</p> <p>Name: [Full formal name of Surety]</p> <p>Address (<i>principal place of business</i>): [Address of Surety's principal place of business]</p>
<p>Owner</p> <p>Name: City of Marine City</p> <p>Mailing address (<i>principal place of business</i>): 260 South Parker Street Marine City, MI 48039</p>	<p>Contract</p> <p>Description (<i>name and location</i>): Water System Improvements Contract 2 – Water Treatment Plant Improvements DWSRF #7852-01</p> <p>Contract Price: [Amount from Contract]</p> <p>Effective Date of Contract: [Date from Contract]</p>
<p>Bond</p> <p>Bond Amount: [Amount]</p> <p>Date of Bond: [Date] <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 16</p>	
<p>Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.</p>	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<p><i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i></p>	

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

whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.
12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
14. Definitions
 - 14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
 - 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
 - 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
 - 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

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

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

16. Modifications to this Bond are as follows: **[Describe modification or enter “None”]**

SECTION 00 61 14

PAYMENT BOND

<p>Contractor</p> <p>Name: [Full formal name of Contractor]</p> <p>Address <i>(principal place of business)</i>: [Address of Contractor’s principal place of business]</p>	<p>Surety</p> <p>Name: [Full formal name of Surety]</p> <p>Address <i>(principal place of business)</i>: [Address of Surety’s principal place of business]</p>
<p>Owner</p> <p>Name: City of Marine City</p> <p>Mailing address <i>(principal place of business)</i>: 260 South Parker Street Marine City, MI 48039</p>	<p>Contract</p> <p>Description <i>(name and location)</i>: Water System Improvements Contract 2 – Water Treatment Plant Improvements DWSRF #7852-01</p> <p>Contract Price: [Amount, from Contract]</p> <p>Effective Date of Contract: [Date, from Contract]</p>
<p>Bond</p> <p>Bond Amount: [Amount]</p> <p>Date of Bond: [Date]</p> <p><i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 18</p>	
<p>Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.</p>	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<p><i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i></p>	

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

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

- 16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 - 16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 - 16.1.7. The total amount of previous payments received by the Claimant; and
 - 16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
- 16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic’s lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of “labor, materials, or equipment” that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
 - 16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
 - 16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
 18. Modifications to this Bond are as follows: **[Describe modification or enter “None”]**

SECTION 00 62 67
PAYMENT APPLICATION FORM

PART 1 - GENERAL

Not Used.

PART 2 - PRODUCTS

Not Used.

PART 3 - SUMMARY

3.01 SCHEDULES:

- A. Attached are the following forms:
 - 1. Pay Application Form; EDCDC No. C-620, 2018 Edition

END OF SECTION

Contractor's Application for Payment

Owner: _____	Owner's Project No.: _____
Engineer: _____	Engineer's Project No.: _____
Contractor: _____	Contractor's Project No.: _____
Project: _____	
Contract: _____	
Application No.: _____	Application Date: _____
Application Period: From _____ to _____	

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

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:

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

Contractor: _____

Signature: _____ **Date:** _____

Recommended by Engineer	Approved by Owner
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____
Approved by Funding Agency	
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____

Progress Estimate - Lump Sum Work					Contractor's Application for Payment				
Owner:					Owner's Project No.:				
Engineer:					Engineer's Project No.:				
Contractor:					Contractor's Project No.:				
Project:									
Contract:									
Application		Application Period:		From		to		Application Date:	
A	B	C	D	E	F	G	H	I	
Item No.	Description	Scheduled Value (\$)	Work Completed		Materials Currently	Work Completed	% of Scheduled	Balance to Finish (C - G)	
			(D + E) From	This Period					
Original Contract									
Original Contract Totals									
Change Orders									
Change Order Totals									
Original Contract and Change Orders									
Project Totals									

Stored Materials Summary

Contractor's Application for Payment

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

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

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

SECTION 00 72 00
GENERAL CONDITIONS

EJCDC NO. C-700 (2018 EDITION)
2 TITLE PAGES, TABLE OF CONTENTS PAGES 1 TO 5, AND PAGES 1 THROUGH 70

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 OF THE CONSTRUCTION CONTRACT

Prepared By



Endorsed By



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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

- requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.
- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
 12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
 17. *Cost of the Work*—See Paragraph 13.01 for definition.
 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
 20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
 21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

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

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
1. does not conform to the Contract Documents;
 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

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

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

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

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

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

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

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

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

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

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

4.03 *Reference Points*

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

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

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

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

5.01 *Availability of Lands*

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

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

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

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

5.03 *Subsurface and Physical Conditions*

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

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

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

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

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

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

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

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

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

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
- a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

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

- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

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

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

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

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

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

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

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

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

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

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

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

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

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 Contractor's Insurance

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

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

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

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

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

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

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

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

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

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

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

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

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

7.10 *Taxes*

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

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

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

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

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

7.15 *Emergencies*

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

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
- 2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

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

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

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

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
1. Observations by Engineer;
 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. Use or occupancy of the Work or any part thereof by Owner;
 5. Any review and approval of a Shop Drawing or Sample submittal;
 6. The issuance of a notice of acceptability by Engineer;
 7. The end of the correction period established in Paragraph 15.08;
 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

- 9.05 *Lands and Easements; Reports, Tests, and Drawings*
- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
 - B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
 - C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 9.06 *Insurance*
- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.
- 9.07 *Change Orders*
- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 *Inspections, Tests, and Approvals*
- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 *Limitations on Owner's Responsibilities*
- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- 9.10 *Undisclosed Hazardous Environmental Condition*
- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 *Evidence of Financial Arrangements*
- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).
- 9.12 *Safety Programs*
- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
 - B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

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

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

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

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
 5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
- 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
- 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
- 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 6. Expenses incurred in preparing and advancing Claims.
- 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

- 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
- 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:* Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance:* Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

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

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 2. agree with the other party to submit the dispute to another dispute resolution process; or
 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

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

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

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

18.05 *No Waiver*

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

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

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

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement EJCDC® C 700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

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

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC 4.05."

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

51. Bulletin - A document outlining possible changes to the Contract Documents which is issued by Engineer on behalf of Owner requesting add or deduct costs from Contractor.

ARTICLE 2 – PRELIMINARY MATTERS

2.02 *Copies of Documents:*

SC-2.02 Delete Paragraph 2.02.A. in its entirety and insert the following new paragraph in its place:

- A. Owner shall furnish to Contractor one copy of conformed Contract Documents incorporating all addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully signed counterpart of the Agreement) in electronic portable document format (PDF). Printed copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

- B. Electronic Documents Protocol: The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol ("EDP" or "Protocol") for exchange of electronic transmittals.

1. Basic Requirements

- a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

- b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.
 - c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.
 - d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.
 - e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.
 - f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.
2. System Infrastructure for Electronic Document Exchange
- a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.
 - 1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 10 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.
 - 2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.
 - b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

- c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.
- d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent.
- e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, for as long as required by the Contract and as each party deems necessary for its own purposes.
- f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.
- g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.

C. Software Requirements for Electronic Document Exchange; Limitations

- 1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.
 - a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.
- 2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.
- 3. Software and data formats for exchange of Electronic Documents will conform to the requirements below, including software versions, if listed.

Item	Electronic Documents	Transmittal Means	Data Format	Note (1)
a.1	General communications, transmittal covers, meeting notices and responses to general information requests for which there is no specific prescribed form.	Email	Email	
a.2	Meeting agendas, meeting minutes, RFI's and responses to RFI's, and Contract forms.	Email w/ Attachment	PDF	(2)
a.3	Contractors Submittals (Shop Drawings, "or equal" requests, substitution requests, documentation accompanying Sample submittals and other submittals) to Owner and Engineer, and Owner's and Engineer's responses to Contractor's Submittals, Shop Drawings, correspondence, and Applications for Payment.	Email w/ Attachment	PDF	
a.4	Correspondence; milestone and final version Submittals of reports, layouts, Drawings, maps, calculations and spreadsheets, Specifications, Drawings and other Submittals from Contractor to Owner or Engineer and for responses from Engineer and Owner to Contractor regarding Submittals.	Email w/ Attachment or LFE	PDF	
a.5	Layouts and drawings to be submitted to Owner for use.	Email w/ Attachment or LFE	DWG	
a.6	Spreadsheets and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	EXC	
Notes				
(1)	All exchanges and uses of transmitted data are subject to the appropriate provisions of Contract Documents.			
(2)	Transmittal of written notices is governed by Paragraph 18.01 of the General Conditions.			
Key				
Email	Standard Email formats (.htm, .rtf, or .txt). Do not use stationery formatting or other features that impair legibility of content on screen or in printed copies			
LFE	Agreed upon Large File Exchange method (FTP, CD, DVD, hard drive)			
PDF	Portable Document Format			
DWG	Autodesk® Civil 3D .dwg format Version 18			
EXC	Microsoft® Excel .xls or .xml format			

SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. Requests by Contractor for Electronic Documents in Other Formats

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.
2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be

subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:

- a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.
 - b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.
 - c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.
 - d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.
3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis at Engineer's standard hourly rates for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

No Supplementary Conditions in this Article.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 Commencement of Contract Times; Notice to Proceed

SC-4.01 Delete Paragraph 4.01.A in its entirety and insert the following:

- A. The Contract Times will commence to run on the date indicated in the Notice to Proceed.

4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. Weather-Related Delays

- a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered abnormal weather conditions. Requests for time extension due to abnormal weather conditions will be submitted to the Engineer within five days of the end of the abnormal weather condition event. It is the responsibility of the Contractor to provide the information listed in SC 4.05.C.5b.
- b. Should the Contractor wish to claim a delay due to adverse weather, it is the Contractor's responsibility to provide adequate documentation for the claim.

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

5.03 *Subsurface and Physical Conditions*

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

The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
Geotechnical Exploration and Engineering Report	1-24-24	As noted in report – Soil boring and HMA core thicknesses

The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
None		

5.06 *Hazardous Environmental Conditions at Site*

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

The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
None		

The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
None		

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

Required Performance Bond Form: The performance bond that Contractor furnishes will be in the form of EJCDC® C 610, Performance Bond (2018 edition).

Required Payment Bond Form: The payment bond that Contractor furnishes will be in the form of EJCDC® C 615, Payment Bond (2018 edition).

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, and pollution liability must include as additional insureds the following: City of Marine City and Fleis & VandenBrink

Waiver of subrogation shall apply to additional insured.

E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Employer's Liability	
Each accident	\$500,000
Each employee	\$500,000
Policy limit	\$500,000

- F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
 2. damages insured by reasonably available personal injury liability coverage, and
 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
 - a. Such insurance must be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.
 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of “insured contract” (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
 2. Any exclusion for water intrusion or water damage.
 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
 4. Any exclusion of coverage relating to earth subsidence or movement.
 5. Any exclusion for the insured’s vicarious liability, strict liability, or statutory liability (other than worker’s compensation).
 6. Any limitation or exclusion based on the nature of Contractor’s work.
 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	\$2,000,000
Products—Completed Operations Aggregate	\$2,000,000
Personal and Advertising Injury	\$1,000,000
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000

- J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Combined Single Limit (Bodily Injury & Property Damage)	\$1,000,000

- K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer’s liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$1,000,000
General Aggregate	\$1,000,000

- L. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	\$1,000,000
General Aggregate	\$1,000,000

6.07 *Owner's Protective Liability Insurance*

SC-6.07 Add the following new paragraph immediately after Paragraph 6.06:

- 6.07 Contractor shall purchase Owner's Protective Liability Insurance written in the name of the Owner in the amount of One Million Dollars (\$1,000,000), Each Occurrence Limit and \$2,000,000 Aggregate Limit. Entities and persons identified as additional insureds in SC 6.03.D, except OWNER, shall be named as additional insureds in Owner's Protective Liability Insurance.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

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

- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with the Owner's written consent.
1. Regular working hours will be 7:00 a.m. through 7:00 p.m. Monday through Friday.
 2. Owner's legal holidays are:
 - a. January 1st.
 - b. Memorial Day weekend from 5:00 p.m. the Friday before Memorial Day through 7:00 a.m. the Tuesday after Memorial Day.
 - c. July 4th holiday period from 5:00 p.m. Thursday July 3rd, 2025 through 7:00 a.m. Monday July 7th, 2025 and period from 5:00 p.m. Thursday July 2nd, 2026 through 7:00 a.m. Monday July 6th, 2026
 - d. Labor Day weekend from 5:00 p.m. the Friday before Labor Day through 7:00 a.m. the Tuesday after Labor Day.

- e. Thanksgiving Day and the day after thanksgiving.
 - f. December 24th and 25th.
- D. Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work outside of regular working hours or during legal holidays. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, the Owner may impose a reasonable set-off against payments due under Article 15.

7.13 *Safety and Protection*

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

- K. Contractor shall indemnify, defend, and hold harmless Owner and Engineer from any liability, loss, cost, penalty, damage or expense, including attorney's fees, arising from any claim, damage, proceeding, citation, or work stoppage in any way connected with Contractor's performance of the Work and violation of any requirement of public authority or applicable Laws and Regulations, including state and federal OSHA.

ARTICLE 8 – OTHER WORK AT THE SITE

No Supplementary Conditions in this Article.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

No Supplementary Conditions in this Article.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:
1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.
 3. *Liaison*
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

- c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.
4. *Review of Work; Defective Work*
- a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Observe whether any Work in place appears to be defective.
 - c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
5. *Inspections and Tests*
- a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
 - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
6. *Payment Requests: Review Applications for Payment with Contractor*
7. *Completion*
- a. Participate in Engineer's visits regarding Substantial Completion.
 - b. Assist in the preparation of a punch list of items to be completed or corrected.
 - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
 - d. Observe whether items on the final punch list have been completed or corrected.
- D. The RPR will not:
- 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
 - 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
 - 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
 - 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
 - 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 - 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
 - 7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11 – CHANGES TO THE CONTRACT

No Supplementary Conditions in this Article.

ARTICLE 12 – CLAIMS

No Supplementary Conditions in this Article.

ARTICLE 13 – COST OF WORK; ALLOWANCES, UNIT PRICE WORK

No Supplementary Conditions in this Article.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

No Supplementary Conditions in this Article.

ARTICLE 15 – PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

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

1. 30 days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

15.03 Substantial Completion

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

No Supplementary Conditions in this Article.

ARTICLE 17 – FINAL RESOLUTIONS OF DISPUTES

17.01 Methods and Procedures

SC-17.01 Add the following new paragraphs immediately after Paragraph 17.01.

17.02 Mediation

- A. Before any claim, dispute or other matter between Owner and Contractor is submitted to arbitration or litigation, the Parties agree that they shall first negotiate in good faith utilizing the Chairperson of any Board or governing body and/or the President of the company in an effort to resolve the dispute(s). That negotiation shall take place within fifteen (15) days of notice of any dispute. The negotiation is a condition precedent to any continued dispute resolution proceedings. If the parties are unable to resolve the dispute through negotiation, within thirty (30) days thereafter, the parties shall mediate the matter before an experienced, professional mediator mutually agreeable to the parties. All offers, promises, conduct and statements, whether oral or written, made in the course of the negotiation by

any of the Parties, their agents, employees, experts and attorneys shall be confidential, privileged and inadmissible for any purpose. Unless otherwise agreed, the mediation will occur at the location of the project and each party shall bear the costs of mediation equally. The mediation is a condition precedent to any continued dispute resolution proceedings. The mediation shall continue until an impasse is called by the appointed mediator. In the event that the attempt to resolve the matter through mediation fails then the matter may be submitted to arbitration.

17.03 Arbitration

- A. All matters subject to final resolution under this Article, and any related claims, shall be resolved by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC 17.02). Any controversy or claim in the amount of \$100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.
- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable, then within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.
- C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers with fifteen (15) or more years of experience. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.
- D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.
- E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.
- F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.
- G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
 - 1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration

2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;
 3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and
 4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.
- H. The award will be final and binding. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract or to the extent disclosure is necessary to enforce the award by attaching a true copy to pleadings. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

ARTICLE 18 – MISCELLANEOUS

No Supplementary Conditions in this Article.

END OF SECTION

SECTION 00 91 13

ADDENDUM

Addendum No. _____

Owner: City of Marine City
 Contract: Contract 2 – Water Treatment Plant Improvements
 Project: Water System Improvements Date: _____
 Owner's Contract No.: _____ Engineer's Project No.: 864261
 Engineer: Fleis & Vandenbrink

NOTICE TO ALL PROSPECTIVE BIDDERS

BIDS DUE: _____ -- ISSUED TO ALL PLANHOLDERS OF RECORD

=====

This Addendum is a part of the Contract Documents and modifies the previously issued Bidding Documents. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may result in rejection of the Bid.

SPECIFICATION CHANGES

ITEM NO. 1:
 Section _____ [Title] _____
 [Paragraph] _____

 [Paragraph] _____

ITEM NO. 2:
 Section _____ [Title] _____
 [Paragraph] _____

DRAWING CHANGES

ITEM NO. 3:
 Sheet(s) _____:

ITEM NO. 4:
 Sheet(s) _____:

ATTACHMENTS:

END OF SECTION

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY OF WORK:

- A. The Work consists of improvements to the Marine City Water Treatment Plant (WTP). The work is being performed in accordance with the Drinking Water State Revolving Fund (DWSRF) Project Plan adopted by the City.
- B. Major work items include, but are not limited to, the following:
 - a. Replacement of the low service pumps.
 - b. Providing a new rapid mixer and modifications to the existing alum feed system.
 - c. Rehabilitation of the existing filters including replacement of the underdrains, media, and surface wash system.
 - d. Replacement of the finished water pipe and valves in the pipe trench.
 - e. Coating of the flocculation/sedimentation basins, filters, and finished water reservoir.
 - f. Replacement of the access hatches/manholes on the finished water storage tank.
 - g. Providing a new mixer in the City's elevated storage tanks.
 - h. Miscellaneous piping, valves, electrical and controls, coating systems, concrete repairs, lab equipment, and all associated appurtenances to make a fully functional system.

1.02 SEQUENCING AND SCHEDULING

- A. General:
 - 1. CONTRACTOR shall be solely responsible for all construction sequencing and scheduling required by the Contract Documents.
 - 2. Coordinate timing of all work with OWNER.
 - 3. Coordinate timing and sequencing of all new construction to provide adequate water supply to the community throughout construction.
 - 4. The following anticipated construction sequence is offered as a suggestion to CONTRACTOR and to emphasize critical tasks of the Work. This contract does not require the CONTRACTOR to follow the suggested schedule. This is not intended as a complete list of all work to be completed.
- B. Submittals:
 - 1. Submit in accordance with Section 01 33 00 - Submittals.
 - 2. Submit CONTRACTOR's proposed construction sequence with anticipated starting and finishing times of critical items of work to ENGINEER for review.
 - 3. Sequence submittal shall be provided for review within 1 week after receipt of Notice to Proceed.
 - 4. Alternative sequences: CONTRACTOR may propose alternative sequences to that indicated in paragraph 1.02 of this Section in an attempt to minimize the disruption of the operation of the existing facility or to streamline the tasks of the Work.
- C. Key Scheduling Items
 - 1. CONTRACTOR shall notify OWNER at least 1 week prior to starting any work that interferes with the operation or supply of water to the community. Work interfering with the operation and supply of water includes, but is not limited to: pipe

connections, filter rehabilitation, transfer of electrical supply, pump and piping modifications, modifications to existing controls, etc.

2. At all times, a minimum of one low service pump, one flocculation/sedimentation basin, two filters, one high service pump, chemical feed systems, and related equipment shall be kept online and in automatic operation. CONTRACTOR shall provide any and all temporary piping, utilities, electrical equipment, controls and instrumentation or other facilities that may be required during construction to ensure that there is no disruption to the water supply at any time. The only exceptions to this requirement are as follows:
 - a. Contractor may take the plant offline for a period of up to one week for the Low Service Pump and Rapid Mixer work and Treated Water Pipe and Valve replacement. The Water Treatment Plant shall only be taken offline from October to March.
 - b. Temporary Water Treatment Plant shutdowns of less than 24 hours may be allowed with approval of the Owner.

D. Anticipated Construction Sequence by area:

<u>Task</u>	<u>By</u>	<u>Task Description</u>
LOW SERVICE PUMP AND RAPID MIXER		
1.	CONTRACTOR	Secure orders for all material and equipment.
2.	CONTRACTOR	Coordinate with OWNER and ENGINEER work to be completed.
3.	OWNER	Take low service pumps to be removed out of service.
4.	CONTRACTOR	Coordinate work to keep Low Service Pump No. 3 in service.
5.	CONTRACTOR	Remove existing low service pump and associated piping.
6.	CONTRACTOR	Install new low service pumps, rapid mixer, piping, valves, electrical, and controls.
7.	CONTRACTOR	Provide temporary discharge piping from the high service pumps to the backwash effluent structure.
8.	CONTRACTOR	Provide startup and training on the new equipment.
9.	OWNER	Open the interconnect to East China and take the Water Treatment Plant out of service.
10.	CONTRACTOR	Demolish Low Service Pump No. 3 and make final piping connections.
11.	OWNER	Place the new equipment in service and bring the Water Treatment Plant back in service. Close the interconnect.
FILTER REHABILITATION		
1.	CONTRACTOR	Secure orders for all material and equipment.
2.	CONTRACTOR	Coordinate with OWNER and ENGINEER work to be completed.
3.	OWNER	Isolate Filter No. 1 and direct flow to Filters No. 2 and 3
4.	CONTRACTOR	Remove surface wash, media and underdrains in Filter No. 1.
5.	ENGINEER	Inspect the tank and provide recommendations for concrete repairs.
6.	CONTRACTOR	Repair concrete in the filter tank as necessary.
7.	CONTRACTOR	Prepare and coat filter.
8.	CONTRACTOR	Install new surface wash, media, and underdrains in Filter No. 1.
9.	CONTRACTOR	Disinfect filter and collect bacteriological samples.
10.	CONTRACTOR	Provide startup on new equipment.
11.	OWNER	Backwash and return Filter No. 1 to service. Isolate Filter No. 2.
12.	CONTRACTOR	Remove surface wash, media, and underdrains in Filter No. 2.
13.	ENGINEER	Inspect the tank and provide recommendations for concrete repairs.
14.	CONTRACTOR	Repair concrete in the filter tank as necessary.
15.	CONTRACTOR	Prepare and coat filter.
16.	CONTRACTOR	Install new surface wash, media, and underdrains in Filter No. 2.

- 17. CONTRACTOR Disinfect filter and collect bacteriological samples.
- 18. CONTRACTOR Provide startup on new equipment.
- 19. OWNER Backwash and return Filter No. 1 to service. Isolate Filter No. 3
- 20. CONTRACTOR Remove and surface wash, media and underdrains in Filter No. 3.
- 21. ENGINEER Inspect the tank and provide recommendations for concrete repairs.
- 22. CONTRACTOR Repair concrete in the filter tank as necessary.
- 23. CONTRACTOR Prepare and coat filter.
- 24. CONTRACTOR Install new surface wash, media, and underdrains in Filter No. 3.
- 25. CONTRACTOR Disinfect filter and collect bacteriological samples.
- 26. CONTRACTOR Provide startup on new equipment.
- 27. OWNER Backwash and return Filter No. 1 to service.
- 28. OWNER Accept operation of the new equipment.

TREATED WATER PIPE AND VALVE REPLACEMENT

- 1. CONTRACTOR Secure orders for all material and equipment.
- 2. CONTRACTOR Coordinate with OWNER and ENGINEER work to be completed.
- 3. CONTRACTOR Provide finish coating on finished water piping and valves prior to installation in the pipe trench. Touch up coating as necessary following installation.
- 12. OWNER Open the interconnect to East China and take the Water Treatment Plant out of service.
- 13. CONTRACTOR Remove and replace finished water piping.
- 14. CONTRACTOR Disinfect piping and collect bacteriological samples.
- 15. OWNER Bring the Water Treatment Plant back in service and close the interconnect.
- 16. CONTRACTOR Replace the existing trench grating and install the new sump pumps.
- 17. OWNER Accept operation of the new equipment.

FINISHED WATER RESERVOIR IMPROVEMENTS

- 1. CONTRACTOR Secure orders for all material and equipment.
- 2. CONTRACTOR Coordinate with OWNER and ENGINEER work to be completed.
- 3. OWNER Pump down finished water reservoir and take the Finished Water Reservoir out of service.
- 4. CONTRACTOR Finish draining finished water reservoir and clean the reservoir.
- 5. ENGINEER Inspect the tank and provide recommendations for concrete repairs.
- 6. CONTRACTOR Repair concrete as necessary.
- 7. CONTRACTOR Remove and replace access hatches and manholes.
- 8. CONTRACTOR Prepare and coat reservoir.
- 9. OWNER Return the finished water reservoir to service.

FLOCCULATION AND SEDIMENTATION BASIN IMPROVEMENTS

- 1. CONTRACTOR Secure orders for all material and equipment.
- 2. CONTRACTOR Coordinate with OWNER and ENGINEER work to be completed.
- 3. OWNER Drain and isolate flocculation and sedimentation basins. Only one train shall be taken offline at any time.
- 4. CONTRACTOR Finish draining each basin and clean the basins.
- 5. ENGINEER Inspect the tank and provide recommendations for concrete repairs.
- 6. CONTRACTOR Repair concrete as necessary.
- 7. CONTRACTOR Coat the flocculation and sedimentation basins.
- 8. OWNER Return flocculation and sedimentation basins to service.
- 9. OWNER Drain and isolate remaining flocculation and sedimentation basins. Only one train shall be taken offline at any time.
- 10. CONTRACTOR Finish draining each basin and clean the basins.
- 11. ENGINEER Inspect the tank and provide recommendations for concrete repairs.

- 12. CONTRACTOR Repair concrete as necessary.
- 13. CONTRACTOR Coat the flocculation and sedimentation basins.
- 14. OWNER Return flocculation and sedimentation basins to service.

ELEVATED STORAGE TANK MIXER

- 1. CONTRACTOR Secure orders for all material and equipment.
- 2. CONTRACTOR Coordinate with OWNER and ENGINEER work to be completed.
- 3. CONTRACTOR Install water tank mixer and controls. Mixer shall be disinfected in accordance with AWWA C652 prior to being placed in the tower.
- 4. CONTRACTOR Provide startup and training on new equipment.
- 5. OWNER Accept operation of the new equipment.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 PROVISIONS:

A. General:

- 1. Perform the Work to provide for:
 - a. The water supply facilities to be in effective operation at all times.
 - b. Temporary controls and power to existing equipment to maintain operation.
 - c. Maintaining the quantity and pressure of water to meet consumption and fire flow requirements throughout construction.
- 2. Do not allow water levels in water tower to reach elevations where water pressure decreases to undesirable levels.

END OF SECTION

SECTION 01 21 13
CASH ALLOWANCES

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section provides for cash allowances which are to be included in the Contract Price.

1.02 SCHEDULE OF ALLOWANCES:

A. Include in the Contract Price the following amounts:

1. The amount of \$15,000 for an Owner's Systems Integrator for improvements to the WTP SCADA system.

1.03 CASH ALLOWANCES:

A. Costs associated with allowances:

1. All costs associated with allowances which are not specifically defined in Schedule of Allowances, paragraph 1.02 of this Section shall be included in the Base Bid.
2. Associated costs not specifically defined in the Schedule of Allowances may include, but are not necessarily limited to:
 - a. Unloading.
 - b. Handling on the Site.
 - c. Labor.
 - d. Installation.
 - e. Overhead.
 - f. Profit.

1.04 ADJUSTMENT OF COSTS:

A. Change Order: To adjust Contract Price if final cost is different from allowance.

B. Documentation:

1. Submit:
 - a. Within sixty (60) days after completion of the work under the allowance.
 - b. Documentation of actual costs.
2. Failure to submit claims within the designated time will constitute a waiver of claims for additional costs.
3. At Contract close-out, reflect all approved changes in Contract amounts in the final statement of accounting.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 22 00

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes, but is not necessarily limited to, descriptions of the method of measurement and basis of payment criteria applicable to the Work.

1.02 MEASUREMENT OF QUANTITIES:

- A. Measurement devices:
 - 1. Weigh scales:
 - a. Inspected, tested, and certified.
 - 2. Platform scales:
 - a. Of enough size and capacity to accommodate the conveying vehicle.
 - 3. Metering devices:
 - a. Inspected, tested, and certified.
- B. Measurement by weight:
 - 1. Concrete reinforcing steel rolled or formed steel or other metal shapes will be measured by handbook weights.
 - 2. Welded assemblies will be measured by handbook weights.
- C. Measurement by volume:
 - 1. Measured by cubic dimension using mean length, width and height or thickness.
- D. Measurement by area:
 - 1. Measured by square dimension using mean length and width or radius.
- E. Linear measurement:
 - 1. Measured by linear dimension, at the item centerline.

1.03 MEASUREMENT AND PAYMENT SCHEDULE:

- A. The following schedule outlines the method of measurement and basis of payment to be used on the project. Requirements for materials and methods described under each item are included in the related specification SECTION.

Item 1. Lump sum payment on a percentage basis per Schedule of Values for all work items except as listed below.

Item 2. Owner's Systems Integrator (Cash Allowance): Measured and paid by the US dollar in conformance with Section 01 21 13 – CASH ALLOWANCES.

Item 3. Concrete Repair – Type A: Measured and paid for by the unit length per plan specification and detail.

Item 4. Concrete Repair – Type B: Measured and paid for by the unit area per plan specification and detail.

- Item 5. Concrete Repair – Type C: Measured and paid for by the unit volume per plan specification and detail.
- Item 6. Concrete Repair – Type D: Measured and paid for by the unit length per plan specification and detail.
- Item 7. Concrete Repair – Type E: Measured and paid for by the unit area per plan specification and detail.
- Item 8. Concrete Repair – Type F: Measured and paid for by the unit volume per plan specification and detail.

1.04 FUNDING AGENCY REQUIREMENTS:

- A. Provide the De Minimis Project Cost spreadsheet with each application for payment.
 - 1. De Minimis components can comprise no more than 5% of the total cost of materials and the cost of an individual component cannot exceed 1%.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes, but is not necessarily limited to, the forms and procedures for modifying the Contract Documents.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 SCHEDULES:

- A. Attached are the following forms:
 - 1. Bulletin.
 - 2. Field Order.
 - 3. Change Order.

END OF SECTION

BULLETIN
Page 1 of 2

CONTRACT FOR:

BULLETIN NO. _____

OWNER:

DATE: _____

DUE DATE: _____

CONTRACTOR:

ENGINEER:

DRAWING REVISION NO.: _____

DRAWING SHEETS ISSUED HEREWITH: _____

DISTRIBUTION: _____

=====

The items below are being considered as possible changes to the Contract Documents for this Project. CONTRACTOR is requested to submit changes in cost, if any, for each item and indicate whether it is an addition to or deduction from the Contract Price. Include all labor, materials, overhead and profit. After reviewing the effects of those changes in the Work, OWNER may issue a Change Order specifying which changes are to be incorporated in the Work, if any.

This Bulletin is not a Change Order and is not to be deemed authorization to proceed with the changes listed.

Additional work or materials, where proposed, shall meet the requirements of the Contract Documents, except where noted.

CONTRACTOR will be responsible for notifying ENGINEER, in writing, concerning any revision or clarification which causes a change in the Contract Documents, but are not specifically mentioned as a cost item in this Bulletin.

CONTRACTOR shall return three (3) completed and signed copies of the Bulletin to ENGINEER on or before the due date noted above.

Each proposed change has been described briefly with additional information provided concerning detailed changes required for the major trades concerned. Only one total cost figure has been requested for each item on the Bulletin; however, a complete breakdown is required for each item as supporting documentation. This will allow OWNER to more easily evaluate the proposed cost changes. Each Bulletin item is an all-inclusive item and may concern work from several trades or Subcontractors. It is CONTRACTOR's responsibility to ensure that all work for each item has been included in the total cost figure provided to OWNER.

BULLETIN
Page 2 of 2

BULLETIN NO. _____

DATE: _____

SPECIFICATION CHANGES

Item No. 1:

Section _____ - _____

[Paragraph] _____
_____ Add/Deduct \$ _____

Item No. 2:

Section _____ - _____

[Paragraph] _____
_____ Add/Deduct \$ _____

DRAWING CHANGES

Item No. 3:

Sheet(s) _____:

_____ Add/Deduct \$ _____

Item No. 4:

Sheet(s) _____:

_____ Add/Deduct \$ _____

CONTRACTOR:

Signature

Name and Title of Signatory

Date

FIELD ORDER NO.: [Number of Field Order]

Owner:
Engineer:
Contractor:
Project:
Contract Name:

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

Date Issued:

Effective Date of Field
Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: _____

Title: _____

Date: _____

CHANGE ORDER NO.: [Number of Change Order]

Owner: _____ Owner's Project No.: _____
 Engineer: _____ Engineer's Project No.: _____
 Contractor: _____ Contractor's Project No.: _____
 Project: _____
 Contract Name: _____
 Date Issued: _____ Effective Date of Change Order: _____
 The Contract is modified as follows upon execution of this Change Order:

Description:
[Description of the change]

Attachments:
[List documents related to the change]

Change in Contract Price	Change in Contract Times [State Contract Times as either a specific date or a number of days]
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. [Number of previous Change Order] : \$ _____	[Increase] [Decrease] from previously approved Change Orders No.1 to No. [Number of previous Change Order] : Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: \$ _____	[Increase] [Decrease] this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required)

By: _____
 Title: _____
 Date: _____

Authorized by Contractor

Authorized by Owner

By: _____
 Title: _____
 Date: _____

Approved by Funding Agency (if applicable)

SECTION 01 29 73
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes preparation and submittal of a schedule of values as specified herein and as necessary for the proper and complete performance of the Work.

1.02 GENERAL:

- A. Timing of submittal: Submit to ENGINEER a schedule of values allocated to the various portions of the Work within ten (10) days after the Effective Date of the agreement.
- B. Supporting data: Upon request of ENGINEER, support the values with data that will substantiate their correctness.
- C. Use of schedule: The schedule of values, unless objected to by ENGINEER, shall be used only as the basis for the CONTRACTOR's Applications for Payment.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES:

- A. Form and Identification:
 - 1. Type schedule on 8 ½ -inch by 11-inch white paper.
 - 2. CONTRACTOR's standard forms and automated printout may be used.
 - 3. Identify schedule with:
 - a. Title of Project and location.
 - b. ENGINEER.
 - c. Project number.
 - d. Name and address of CONTRACTOR.
 - e. Contract designation.
 - f. Date of submission
- B. Detail:
 - 1. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction.
 - 2. The value of a single item shall not be greater than 10% of the total Contract Price unless approved by the ENGINEER.
- C. Sub-values: For each major line item list subvalues of major products or operations under the item.
- D. Allowances: Include in each line item the amount of the respective allowances specified in Section 01 21 13 - CASH ALLOWANCES, if appropriate. For unit cost allowances, give quantities measured from Contract Documents multiplied by the unit cost equal to the total cost for the item.
- E. Change Orders: For each Application for Payment, revise schedule to list Change Orders.

- F. For the various portions of the Work:
 - 1. Each item shall include a directly proportional amount of CONTRACTOR's overhead and profit.
 - 2. For items on which progress payments will be requested for stored materials, breakdown the value into:
 - a. The cost of the materials delivered and unloaded, with taxes paid.
 - b. The total installed value.

- G. The sum of all values listed in the schedule shall equal the total Contract Price.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. The Engineer will schedule and administer the preconstruction conference and periodic progress meetings.
 - 1. Prepare the agenda for the meetings.
 - 2. Distribute written notice of each meeting in advance of meeting date.
 - 3. Make physical arrangements for meeting.
 - 4. Preside at meetings.
 - 5. Record the minutes.
 - 6. Distribute copies of the minutes to meeting attendees and affected parties.
- B. Representatives of Contractor, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.02 PRECONSTRUCTION CONFERENCE:

- A. Schedule: Meeting will be prior to the start of work at a time and place designated by the Engineer.
- B. Attendance:
 - 1. Owner.
 - 2. Engineer.
 - 3. Contractor.
 - 4. Major Subcontractors.
 - 5. Utility companies.
 - 6. Governmental agencies.
 - 7. Contractor's Safety representative.
- C. Agenda:
 - 1. Utility conflicts.
 - 2. Responsibilities
 - 3. General contract terms.
 - 4. Supervision.
 - 5. Schedules and seasonal limitations.
 - 6. Approvals and testing.
 - 7. Clearances and notices.
 - 8. Construction procedures.
 - 9. Payments and estimates.
 - 10. Labor requirements.
 - 11. Safety.

1.03 PROGRESS MEETINGS:

- A. Schedule: Meetings will be scheduled a minimum of once each month at a time and place designated by the Engineer.

B. Attendance:

1. Engineer.
2. Contractor.
3. Subcontractors as pertinent to agenda.
4. Government agencies as pertinent to agenda.
5. Safety representatives.

C. Agenda:

1. Review and approve minutes of previous meeting.
2. Review of work progress since previous meeting.
3. Field observations, problems, conflicts.
4. Problems which impede construction schedule.
5. Review of off-site fabrication and delivery schedules.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to construction schedule.
8. Proposed work during the succeeding work period.
9. Coordination of schedules.
10. Review of submittal schedules.
11. Review of proposed changes for effect on construction schedule and on completion date.
12. Safety report.
13. Review new business.
14. Establish date for next meeting.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.01 CONSTRUCTION SCHEDULES:

- A. General:
 - 1. Coordinate with work by others as explained in SECTION 00 72 00 GENERAL CONDITIONS.
 - 2. Contractor shall notify Engineer 72 hours prior to start of the work or prior to a major increase in the work force if these vary from schedule as submitted.
- B. Form of Schedules:
 - 1. Prepare schedules in the form of a horizontal bar chart.
 - 2. Provide a separate horizontal bar for each trade or operation.
 - 3. Provide a horizontal time scale identifying the first workday of each week.
 - 4. The order shall be the chronological beginning of each work item.
 - 5. The row identification shall be each major specification section or subdivision of work with distinct graphic delineation.
- C. Content of Schedules:
 - 1. The construction project schedule shall include as a minimum:
 - a. Project start date.
 - b. Start dates and durations for each major trade group, work tasks or other subdivisions of the work.
 - c. Shop drawings, product data, and sample submittal dates and dates when reviewed copies will be required.
 - d. Equipment and/or material delivery dates, if approved.
 - e. Total project duration and end dates.
- D. Updating:
 - 1. Show all occurring changes of previous submission.
 - 2. Show progress completion dates of each activity.
 - 3. Submit a narrative report, if required by Engineer defining:
 - a. Problem areas: Impact of current and anticipated delay factors.
 - b. Schedule changes: Effect on other contractors.
 - c. Revision description: Effect of change of scope and duration of activities.
- E. Submittal of Schedules:
 - 1. The Contractor shall submit the preliminary detailed construction schedule within fifteen (15) days after notice of award. Engineer will return copy within ten (10) days.
 - 2. An updated schedule shall be submitted on the first workday of each month.
- F. Distribution:
 - 1. The reviewed schedule shall be distributed by Engineer to:
 - a. The job site file.
 - b. Owner.

1.02 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

A. General:

1. Where required by specifications, the Contractor shall submit descriptive information which will enable the Engineer to advise the Owner whether the Contractor's proposed materials, equipment, or methods of work are in general conformance to the design concept and in compliance with the drawings and specifications. The information to be submitted shall consist of drawings, specifications, descriptive data, certificates, samples, test results and such other information, all as specifically required in the specifications.

B. Contractor Responsibility:

1. Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the material, equipment or method of work shall be as described in the submittal. The Contractor shall verify that the material and equipment described in each submittal conform to the requirements of the specifications and drawings. If the information shows deviations from the specifications or drawings, the Contractor shall insure that there is no conflict with other submittals and notify the Engineer in each case where his submittal may affect the work of another Contractor or the Owner. The Contractor shall insure coordination of submittals among the related crafts and subcontractors.
2. The Contractor shall be responsible to check and verify all field measurements, all dimensions on shop and setting drawings and all schedules required for the work of all the various trades.
3. Where content of submitted literature includes data not pertinent to the submittal, Contractor shall clearly indicate which portion of the contents is being submitted for Engineer's review.
4. The Contractor shall stamp each submittal with stamp, initialed and signed, certifying to review of the submittal by the Contractor, verification of field measurements and compliance with Contract Documents.

C. Transmittal Procedure:

1. General:

- a. Submittals shall be submitted promptly in accordance with dates in proposals, approved schedules and in such sequence that there is no delay in the Work or the work of any other Contractor.
- b. A unique number, sequentially arranged, shall be noted on the transmittal form accompanying each item's submittal. Original submittal numbers shall have the following format "XXX-Y" where "XXX" is the originally assigned submittal number, and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd and 3rd resubmittals, respectively. Submittal 25-B, for example, is the second resubmittal of submittal 25.

2. Deviation from Contract:

- a. If the Contractor proposed to provide material or equipment which does not conform to the specifications and drawings, he shall indicate so under "deviations" on the transmittal form accompanying the submittal copies. He shall prepare his reason for a change, including cost differential, and request a change order to cover the deviations.

3. Submittal Completeness:

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

D. Review Procedure:

1. Submit in PDF (portable document format) electronic format. Hardcopy submittals may be made with prior approval of the Engineer. For samples, submit the number stated in each specifications section.
2. Unless otherwise specified, within fourteen (14) calendar days after receipt of the submittal, the Engineer shall review and return the submittal to the Contractor. The returned submittal shall indicate one of the following actions:
 - a. If the review indicates that the material, equipment or work method is in general conformance with the design concept, drawings and specifications, submittal copies will be marked "Reviewed, No Exceptions Taken". In this event the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.
 - b. If the review indicates limited corrections are required, submitted copies will be marked "Reviewed, with Corrections Noted". The Contractor may begin implementing the work method by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in O&M data, a corrected copy shall be provided.
 - c. If the review reveals that the submittal is insufficient or contains incorrect data, submitted copies will be marked "Rejected, Resubmit". Except at his own risk, the Contractor shall not undertake work covered by this submittal until it has been revised, resubmitted, and returned marked either "Reviewed, No Exceptions Taken" or "Reviewed, with Corrections Noted".
 - d. If the review indicates that the material, equipment, or work method is not in general conformance with the drawings and specifications, copies of the submittal will be marked "Rejected, Resubmit". Submittals with deviations which have not been identified clearly may be rejected. Except at his own risk, the Contractor shall not undertake the work covered by such submittals until it has been revised, resubmitted and returned marked either "Reviewed, No Exceptions Taken" or "Reviewed, with Corrections Noted".
 - e. If the review indicates that the material or equipment is not from an acceptable manufacturer, as indicated in the specifications, copies of the submittal will be marked "Submit Specific Item". Except at his own risk, the Contractor shall not undertake the work covered by such submittals until it has been revised, resubmitted and returned mark either "Reviewed, No Exceptions Taken" or "Reviewed, with Corrections Noted".

E. Effect of Review of Contractor's Submittal:

1. Review of drawings, methods of work or information regarding materials or equipment the Contractor proposes to provide shall not relieve the Contractor of his responsibility for errors therein and shall not be regarded as an assumption of risks or liabilities by the Engineer or the Owner, or by an officer or employee thereof, and the Contractor shall have no claim under the Contract on account of the failure, or partial failure, of the method of work, material or equipment so reviewed. A mark of "Reviewed, No Exceptions Taken" or "Reviewed, with Corrections Noted" shall mean that the Owner has no objection to the Contractor, upon his own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

F. Re-review Costs:

1. Should Engineer be required to review a submittal more than twice because of failure of the submittal to meet the requirements of the Contract Documents, Engineer will record Engineer's time and expenses for performing all additional reviews. The Owner will compensate Engineer for these additional services and deduct the amount from payments to the Contractor.

1.03 OPERATION AND MAINTENANCE DATA:

A. Requirements:

1. Compile product data on related information appropriate for Owner's operation and maintenance of products furnished.
2. Prepare data in the form of an instructional manual for use by Owner's personnel. Prepare five (5) printed copies of complete sets compiled, bound and indexed. Also provide electronic copy on CD, if available.
3. Submittal of operation and maintenance manuals shall be prior to final payment request.

B. Required Submittals:

1. Refer to technical specification sections for required submittals.

1.04 RECORD DOCUMENTS:

A. Requirements:

1. The Contractor shall maintain on the construction site a minimum of one (1) complete set of Contract Documents amended by "RED LINE" or highlight inclusion to reflect the most immediate status methods, materials and locations and routings of construction. Supplementary sketches shall be included, if necessary, to clearly indicate all work as constructed.
2. At conclusion of work, the Contractor shall submit to the Engineer one (1) complete amended record set of these site documents.
3. Submittal shall be prior to final payment.
4. Failure of the Contractor to maintain an up-to-date set of modified drawings on the project site shall be reason to withhold payments.

1.05 ATTACHMENTS:

A. Shop Drawing List

END OF SECTION

Shop Drawing Submittal List & Log

City of Marine City Last Update:
 Contract 2 - Water Treatment Plant Improvements
 F&V Project No.: 864261

5/1/2024

Contractor shall submit the below Shop Drawings.

Submittal No:	Specification Number	Specification Title	Description
	01 29 73	Schedule of Values	Schedule of values
	01 33 00	Submittals	Construction Schedule
	01 33 00	Submittals	Record Documents
	02 41 00	Demolition	Demolition Schedule
	02 41 00	Demolition	Work Plan
	02 41 00	Demolition	Record Drawings
	03 01 40	Concrete Rehabilitation	Product Data
	03 01 40	Concrete Rehabilitation	Samples
	03 01 40	Concrete Rehabilitation	Qualification Data
	03 01 40	Concrete Rehabilitation	Material Certificates
	03 01 40	Concrete Rehabilitation	Product Test Reports
	03 01 40	Concrete Rehabilitation	Rehabilitation Program
	03 30 00	Cast-In-Place Concrete	Concrete Mix Designs
	03 30 00	Cast-In-Place Concrete	Reinforcing Steel Schedule
	03 30 00	Cast-In-Place Concrete	Certifications
	03 30 00	Cast-In-Place Concrete	Batch Tickets
	03 40 00	Precast Concrete	Dimensional Drawings
	03 40 00	Precast Concrete	Design Calculations
	03 60 00	Grouting	Product Data
	05 53 00	Metal Gratings	Grating
	08 30 10	Access Hatches	Access Hatches
	09 96 00	High-Performance Coatings	Manufacturer's literature
	09 96 00	High-Performance Coatings	Schedules
	09 96 00	High-Performance Coatings	Manufacturer's certificates
	09 96 00	High-Performance Coatings	Applicator's experience
	09 96 00	High-Performance Coatings	Product and maintenance schedules
	09 96 00	High-Performance Coatings	NSF Certifications
	11 53 00	Laboratory Equipment and Supplies	Shop Drawings
	26 00 00	Electrical General Provisions	Insulation Test Records
	26 00 00	Electrical General Provisions	List of Sub-Contractors
	26 00 00	Electrical General Provisions	Work Plan
	26 00 00	Electrical General Provisions	Work Schedule
	26 00 00	Electrical General Provisions	Record Drawings
	26 00 00	Electrical General Provisions	Operating and Maintenance Instructions
	26 00 05	Electrical Work	Record Drawings
	26 05 19	Low Voltage Electrical Power Conductors and Cables	Wire
	26 05 19	Low Voltage Electrical Power Conductors and Cables	Fiber Optic Cable
	26 05 19	Low Voltage Electrical Power Conductors and Cables	Portable Cord
	26 05 26	Grounding	Ground Resistance Test
	26 05 33	Raceway and Boxes for Electrical Systems	Flexible metal conduit
	26 05 33	Raceway and Boxes for Electrical Systems	Liquidtight flexible metal conduit
	26 05 33	Raceway and Boxes for Electrical Systems	Nonmetallic conduit
	26 05 33	Raceway and Boxes for Electrical Systems	Flexible nonmetallic conduit
	26 05 33	Raceway and Boxes for Electrical Systems	Nonmetallic tubing
	26 05 33	Raceway and Boxes for Electrical Systems	Raceway fittings
	26 05 33	Raceway and Boxes for Electrical Systems	Conduit bodies
	26 05 33	Raceway and Boxes for Electrical Systems	Surface raceway
	26 05 33	Raceway and Boxes for Electrical Systems	Wireway
	26 05 33	Raceway and Boxes for Electrical Systems	Pull and junction boxes
	26 05 33	Raceway and Boxes for Electrical Systems	Handholes
	26 05 33	Raceway and Boxes for Electrical Systems	Record Drawings
	26 29 13.13	Across the Line Motor Controllers	Shop Drawings
	26 29 13.13	Across the Line Motor Controllers	Product Data
	26 29 13.13	Across the Line Motor Controllers	O&M Data
	26 29 23	Variable-Frequency Motor Controllers	Variable Frequency Drive Controllers
	26 29 23	Variable-Frequency Motor Controllers	Field Service Technician Qualifications
	26 29 23	Variable-Frequency Motor Controllers	As-Constructed Wiring and Connections
	26 60 03	Instrumentation and Controls	Manufacturer's Certification

Shop Drawing Submittal List & Log

City of Marine City Last Update:
Contract 2 - Water Treatment Plant Improvements
F&V Project No.: 864261

5/1/2024

Contractor shall submit the below Shop Drawings.

Submittal No:	Specification Number	Specification Title	Description
	26 60 03	Instrumentation and Controls	Schematic Drawings and Wiring Diagrams
	26 60 03	Instrumentation and Controls	Proposed Wiring Color Code
	26 60 03	Instrumentation and Controls	Proposed HMI and OIT Screens
	26 60 03	Instrumentation and Controls	Operation and Maintenance Data
	32 92 00	Surface Protection and Restoration	Topsoil test results
	32 92 00	Surface Protection and Restoration	Property owner notification letter
	32 92 00	Surface Protection and Restoration	Seed mixture
	32 92 00	Surface Protection and Restoration	Fertilizer product
	32 92 00	Surface Protection and Restoration	Herbicide product and application method
	32 92 00	Surface Protection and Restoration	Contractor's daily reports
	33 21 14	In-Line Dynamic Mixer	Mixer & Motor
	33 21 14	In-Line Dynamic Mixer	Operation and Maintenance Manuals

SECTION 01 42 13

ABBREVIATIONS

PART 1 - GENERAL

1.01 ABBREVIATIONS:

A. Standards:

AASHTO:	American Association of State Highway Transportation Officials
ACI:	American Concrete Institute
ANSI:	American National Standard Institute
ASA:	American Standard Association
ASTM:	American Society for Testing and Materials
AWS:	American Welding Society
AWWA:	American Water Works Association
CRSI:	Concrete Reinforcing Steel Institute
CSI:	Construction Specifications Institute
EGLE:	Michigan Department of Environment, Great Lakes, and Energy
IDEM:	Indiana Department of Environmental Management
MDPH:	Michigan Department of Public Health
MDNR:	Michigan Department of Natural Resources
MDOT:	Michigan Department of Transportation
NEC:	National Electrical Code
NCPI:	National Clay Pipe Institute
UL:	Underwriters Laboratories Inc.
AISC:	American Institute of Steel Construction
NEMA:	National Electrical Manufacturers Association
NFPA:	National Fire Protection Association

B. Unit Priced Items:

LFt, Lft:	Linear Foot
Ea:	Each
VFt, Vft.:	Vertical Foot
LSum, Lsum:	Lump Sum
Syd, Syd:	Square Yard
Sta:	Station (100 foot)
Cyd, Cyd:	Cubic Yard
SFt, Sft, SqFt:	Square Foot
LB, Lb:	Pound
GAL, Gal:	Gallon

END OF SECTION

SECTION 01 45 00
QUALITY CONTROL

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes the work required for all quality control.

1.02 REFERENCES:

- A. MDOT - Michigan Department of Transportation, "*2020 Standard Specifications for Construction*".
- B. ASTM - American Society of Testing Materials, latest edition.
- C. AASHTO – American Association of State Highway Transportation Officials, latest edition.
- D. AWS – American Welding Society, latest edition.

1.03 QUALITY ASSURANCE:

- A. General:
 - 1. Selection of test specimens will be made by the Engineer.
 - 2. Testing procedure will be in accordance with the current standard specified.
 - 3. Refer to the SECTION requirements for field quality control.

1.04 SUBMITTALS:

- A. Test Specimens: Deliver to the place of inspection and testing.
- B. Certification of Quality by Producer: Deliver to the Engineer.
- C. Certification of Welders: Deliver to the Engineer.

1.05 DELIVERY:

- A. Collect and deliver materials and concrete cylinders to the designated testing laboratory.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Inspection and Testing Agencies:
 - 1. In accordance with the requirements of ASTM E329.
 - 2. Reporting shall be to the Engineer.

PART 3 - EXECUTION

3.01 PERFORMANCE:

- A. Acceptance Tests and Inspection:
 - 1. Aggregates: Certification of quality by producer.
 - 2. Soil density:
 - a. Moisture-density relationships:

- 1) Cohesive (Clays) or Granular (Sands) Soils: ASTM D1557 (Modified Proctor).
 - 2) Granular (Sands) Soils: Michigan Cone Test.
- b. Field density determination according to ASTM standards.
- c. Contractor shall provide access to test location and depth.
3. Asphalt cement: Certification of quality producer.
4. Bituminous mix composition:
 - a. Sample: ASTM D979.B.
 - b. Extraction test: AASHTO T30, AASHTO T168 AND ASTM D2172.
 - c. Frequency: One test within each 500-ton placed.
5. Bituminous pavement density:
 - a. Sample: ASTM D979
 - b. Comparative density tests of in-place material against laboratory specimens of the same material: ASTM D1559 and ASTM D2726.
 - c. Frequency: One test within each 2,500 square yards placed.
6. Brick and Block:
 - a. Buildings:
 - 1) Under 30M: Visual inspection on site.
 - 2) Over 30M: ASTM C216 and ASTM C90
 - b. Manholes and catch basins:
 - 1) Visual inspection on-site
7. Cement: Certification of quality by producer.
8. Concrete:
 - a. Sample: ASTM C172
 - b. Frequency: Once for each 50 cubic yards of each class of concrete placed.
 - c. Perform following from sample:
 - 1) Mold three 6-inch cylinder compressive strength specimens: ASTM: C31
 - 2) Slump test: ASTM C143
 - 3) Air test: ASTM C231
 - 4) Yield test: ASTM C138
 - 5) Strength test: ASTM C139
9. Precast Manholes: Certification of quality by producer.
10. Painting:
 - a. Workmanship: Visual inspection on site.
 - b. Film thickness test: Gauge or yield.
 - c. Frequency: One test within each 100 square feet applied.
11. Pipe:
 - a. Gravity: Laboratory test one-half percent ($\frac{1}{2}\%$) of total item with minimum one piece each size, material and class. Certification of quality by producer acceptable for corrugated metal pipe.
 - b. Pressure: Certification of quality by producer.
12. Steel (reinforcing, structural and miscellaneous): Certification of quality by producer.
13. Welding:
 - a. Certification of welders as follows:
 - 1) Buildings: AWS D1.0 Appendix A.
 - 2) Water Tanks: AWS D1.0 Appendix A.
 - 3) Bridges: MDOT 707.03.D.10.c.
 - b. Visual on-site inspection and nondestructive testing as follows:
 - 1) Buildings: AWS D1.0 Appendix B.
 - 2) Water Tanks: AWWA D100.
 - 3) Bridges: MDOT 707.03.D.10.c.
14. Well soil samples: Sieve analysis ASTM C136

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing, fabrication and installation of the major items listed below as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Temporary Utilities:
 - 1. Electricity.
 - 2. Heating.
 - 3. Ventilation.
 - 4. Water service.
 - 5. Sanitary facilities.
- C. Temporary Construction Facilities:
 - 1. Field offices and sheds.
 - 2. Vehicular access.
 - 3. Parking.
 - 4. Project cleaning and waste removal.
 - 5. Project identification.
 - 6. Traffic regulation.
 - 7. Fire prevention facilities.
- D. Temporary Controls:
 - 1. Barriers.
 - 2. Enclosures and fencing.
 - 3. Security.
 - 4. Water control.
 - 5. Dust control.
 - 6. Noise control.
- E. Removal of Temporary Utilities, Facilities and Controls.

1.02 TEMPORARY ELECTRICITY:

- A. Owner will pay cost of energy used. Exercise measures to conserve energy.
- B. Complement existing power service capacity and characteristics as required for construction operations.
- C. Provide GFCI power outlets, with branch wiring and distribution boxes as required for construction operations. Provide flexible power cords as required for portable construction tools and equipment.

1.03 TEMPORARY HEATING:

- A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions, to facilitate progress of the Work, to meet specified minimum conditions for the installation of materials and to protect materials and finishes from damages due to temperatures or humidity. Pay all costs of installation, maintenance, operation, removal and fuel consumption.

1.04 TEMPORARY VENTILATION:

- A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapors or gases.

1.05 TEMPORARY WATER SERVICE:

- A. Owner will pay cost of temporary water. Exercise measures to conserve energy. Utilize Owner's existing water system, extend and supplement with temporary devices as needed to maintain specified conditions for construction operations.

1.06 TEMPORARY SANITARY FACILITIES:

- A. Provide service, clean and maintain required facilities and enclosures in compliance with laws and regulations. Existing facility use is not permitted. Provide facilities at time of project mobilization.

1.07 TEMPORARY FIELD OFFICES AND SHEDS:

- A. Contractor to coordinate with the Owner for temporary field offices.
- B. Contractor to supply own field trailer.

1.08 VEHICULAR ACCESS:

- A. Construct temporary access roads from public thoroughfares to serve construction area, of width and load bearing capacity to accommodate unimpeded traffic for construction purposes.
- B. Extend and relocate vehicular access as Work progress requires, provide detours as necessary for unimpeded traffic flow.
- C. Location approved by Owner and Engineer.
- D. Provide unimpeded access for emergency vehicles. Maintain 20 feet wide driveways with turning space between and around combustible materials.
- E. Provide means of removing mud from vehicle wheels before entering streets.
- F. Use existing on-site roads for construction traffic. Trailed vehicles not allowed on paved areas.

1.09 PARKING:

- A. Arrange for parking areas to accommodate construction personnel.

- B. Locate as approved by the Owner and Engineer.
- C. When site space is not adequate, provide additional off-site parking.
- D. Use of designated areas of existing parking facilities by construction personnel is permitted.
- E. Do not allow heavy vehicles or construction equipment in parking areas.
- F. Maintenance:
 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water and other deficiencies, to maintain paving and drainage in original or specified condition.
- G. Removal, Repair:
 1. Remove temporary materials and construction before Substantial Completion].
 2. Remove underground work and compacted materials to depth of 2 feet; fill and grade site as specified.
 3. Repair existing facilities damaged by use to original condition.

1.10 PROGRESS CLEANING AND WASTE REMOVAL:

- A. Maintain areas free of waste materials, debris and rubbish. Maintain site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces prior to enclosing spaces.
- C. Sweep and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris and rubbish from site periodically and dispose off site.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 TRAFFIC REGULATION:

- A. Signs, Signals and Devices:
 1. Post Mounted and Wall Mounted Traffic Control and Informational Signs: As approved by authority having jurisdiction.
 2. Traffic Cones and Drums, Flares and Lights: As approved by authority having jurisdiction.
 3. Flag person Equipment: As required by authority having jurisdiction.
- B. Haul Routes:
 1. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
- C. Traffic Signs and Signals:
 1. Provide signs at approaches to site and on site, at crossroads, detours, parking areas and elsewhere as needed to direct construction and affected public traffic.

- D. Removal:
 - 1. Remove equipment and devices when no longer required
 - 2. Repair damage caused by installation
 - 3. Remove post settings to depth of 2 feet.

1.12 FIRE PREVENTION FACILITIES:

- A. Prohibit smoking within buildings under construction [and demolition]. Designate area on site where smoking is permitted. Provide approved ashtrays in designated smoking areas.
- B. Establish fire watch for cutting and welding and other hazardous operations capable of starting fires. Maintain fire watch before, during and after hazardous operations until threat of fire does not exist.

1.13 BARRIERS:

- A. Provide barriers to prevent unauthorized entry to construction areas [to allow for Owner's use of site] and to protect existing facilities and adjacent properties from damage from construction operations [and demolition].
- B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way [and for public access to existing building].
- C. Provide protection for plants designated to remain. Replace damaged plants.

1.14 ENCLOSURES AND FENCING:

- A. Exterior Enclosures:
 - 1. Provide temporary [insulated] weather tight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.15 SECURITY:

- A. Security Program:
 - 1. Protect Work [existing premises] [and] [Owner's operations] from theft, vandalism and unauthorized entry.
 - 2. Initiate program [in coordination with Owner's existing security system] at project mobilization.
 - 3. Maintain program throughout construction period until [Owner occupancy] [Owner acceptance precludes need for Contractor security] [directed by Architect/Engineer].
- B. Entry Control:
 - 1. Restrict entrance of persons and vehicles into Project site [and existing facilities].
 - 2. Allow entrance only to authorized persons with proper identification.
 - 3. Maintain log of workers and visitors, make available to Owner on request.

1.16 WATER CONTROL:

- A. Grade site to drain. Maintain excavations free of water. Provide, operate and maintain pumping equipment.

1.17 DUST CONTROL:

- A. Execute Work by methods to minimize raising dust from construction operations.
- B. Provide Positive means to prevent air-borne dust from dispersing into atmosphere.

1.18 NOISE CONTROL:

- A. Provide methods, means and facilities to minimize noise produced by construction operations.

1.19 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS:

- A. Remove any temporary utilities, equipment, facilities and materials prior to Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes the work required to provide and maintain temporary soil erosion and sedimentation control.

1.02 JOB CONDITIONS:

- A. Requirements: Comply with Drawings and permit requirements.
- B. Permit: Obtain permit from local enforcing agency, if not already obtained.
- C. Time Limitations: MDOT 208.03B.

PART 2 - PRODUCTS

- 2.01 MATERIALS: MDOT 208.02 and as approved by the regulating agency.

PART 3 - EXECUTION

3.01 PERFORMANCE:

- A. General: Abide with all applicable rules and regulations as established by the State of Michigan and the local regulating agency in conjunction with Act 451 of 1994, Natural Resources and Environmental Protection Act, Part 91 as amended, Michigan Soil Erosion and Sedimentation Control (formerly PA 347 of 1972, as amended).
- B. Sediment Removal:
 - 1. Take such steps as are necessary to assure the retention and removal of any sediment which enters a drainage system along the construction route before said system discharges into a stream, pond or lake.
 - 2. If eroded material is allowed to enter a storm sewer system, all catch basins, manholes, pipe and culverts shall be cleaned following construction prior to receipt of final payment. Unless Contractor can document positively to what extent an existing storm sewer system along the construction area was silted in prior to construction, no credit will be given for cleaning the system.
 - 3. Maintain roadways in a passable condition until paving is completed, including any maintenance and dust control.
- C. Construction of Soil Erosion and Sedimentation Control Measures: MDOT 208.03C.
 - 1. Provide and maintain the following temporary soil erosion and sedimentation control measures unless otherwise shown on the Drawings or in the permit:
 - a. Excavated or borrow material stockpile:
 - 1) Place silt fence around stockpile in a manner to prevent soil erosion from entering the drainage system or leaving the site.
 - b. Trench backfill in place.
 - 1) Place silt fence across trenches, ditches and around inlets to prevent soil erosion from leaving the site or entering the drainage system until:
 - 2) Seed and mulch have been placed in non-paved areas.

- 3) Aggregate has been placed in bituminous and gravel areas.
- c. Dewatering discharge.
 - 1) Place bales of hay, straw and/or siltation fencing staked in place at point of discharge, adequately anchored.
- d. Grading limits.
 - 1) Place silt fence along down gradient side of all areas disturbed by grading operations.
- e. Catch basins.
 - 1) Provide inlet protection around catch basin and below grates. Remove after turf is established
- f. Culvert inlets.
 - 1) Place stone check dam and silt fence upstream of all culvert inlets.
- g. Drain cleanout.
 - 1) Excavate sediment basin and place stone check dam at downstream end prior to cleanout operation.

D. Maintenance of Soil Erosion and Sedimentation Control Measures: MDOT 208.03C.

E. Removal of Soil Erosion and Sedimentation Control Measures: MDOT 208.03D.

3.02 SCHEDULES:

- A. MDOT Standard Plan R-96-E (6 sheets)

END OF SECTION

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes, but is not necessarily limited to, maintaining all structures and the Site in a standard of cleanliness as indicated on the Drawings, as specified herein and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in DIVISION 01 of these Specifications.
 - b. In addition to standards described in this Section, comply with all requirements for cleaning up as described in various other Sections of these Specifications.

1.02 QUALITY ASSURANCE:

- A. Inspection:
 - 1. Daily and more often if necessary.
 - 2. Conduct inspections to verify that requirements of cleanliness are being met.

1.03 DELIVERY, STORAGE AND HANDLING:

- A. Hazards control:
 - 1. Volatile wastes:
 - a. Store in covered metal containers.
 - b. Remove from premises daily.
 - 2. Prevent accumulation of wastes which create hazardous conditions.
 - 3. Provide adequate ventilation during use of volatile or noxious substances.

1.04 PROJECT CONDITIONS:

- A. Cleaning and disposal:
 - 1. Conduct operations to comply with local ordinances and anti-pollution laws.
 - 2. Not allowed:
 - a. Burning or burying of rubbish or waste materials onsite.
 - b. Disposal of volatile wastes in storm or sanitary sewers: Volatile wastes include, but are not limited to, mineral spirits, oil or paint thinner.
 - c. Disposal of wastes into streams or waterways.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT:

- A. Compatibility:
 - 1. Compatible with the surface being cleaned.
 - 2. Recommended by the Manufacturer of the material being cleaned.
 - 3. As reviewed by Engineer.

PART 3 - EXECUTION

3.01 PROGRESS CLEANING:

A. General:

1. Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.
2. Store materials:
 - a. In an orderly arrangement allowing maximum access.
 - b. To allow unimpeded drainage and traffic.
 - c. Provide for the required protection of materials.
3. Scrap, debris, waste materials and other items not required for construction of the Work.
 - a. Do not allow accumulation.
 - b. Remove from Site at least each week and more often if necessary.
 - c. Provide adequate storage for all materials awaiting removal.
4. Observe all requirements for fire protection and protection of the environment.

B. Site:

1. Daily, and more often if necessary:
 - a. Inspect the Site.
 - b. Pick up all scrap, debris and waste material: remove all such items to the place designated for their storage.
2. Weekly, and more often if necessary:
 - a. Inspect all arrangements of materials stored onsite.
 - b. Re-stack or otherwise service all arrangements to meet the requirements of paragraph 3.01-A-1 above.
3. At all times maintain the Site in a neat and orderly condition which meets the approval of Engineer.
4. Paved surfaces: Keep clean.
5. Dust control:
 - a. Control dust on or near the Work by the application of water, or other approved means.
 - b. If Contractor fails to correct unsatisfactory conditions with 24 hours after due notification:
 - 1) Owner may arrange for such work to be performed by other means.
 - 2) Pay costs.

C. Structures:

1. Weekly, and more often if necessary:
 - a. Inspect the structures.
 - b. Pick up all scrap, debris and waste material: remove all such items to the place designated for their storage.
 - c. Sweep all interior spaces clean:
 - 1) Clean: Free from dust and other material capable of being removed by reasonable diligence using a hand-held broom.
2. Preparation for installation of succeeding material:
 - a. Clean the structures or pertinent portions thereof:
 - 1) To the degree of cleanliness recommended by the Manufacturer of the succeeding material.
 - 2) Using all equipment and materials required to achieve the required cleanliness.

3. After installation of finish floor material:
 - a. Always clean the finish floor daily while work is being performed in the space in which finish materials have been installed.
 - 1) Clean: Free from all foreign material which, in the opinion of Engineer, may be injurious to the finish floor material.
4. Schedule cleaning operations so that dust and other contaminants resulting from cleaning operations will not fall on wet, recently painted surfaces.

3.02 FINAL CLEANING:

- A. Definitions:
 1. Clean: The level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.
- B. Prior to completion of the Work:
 1. Remove from the Site all tools, surplus materials, equipment, scrap, debris and waste.
 2. Conduct final progress cleaning as described in Article 3.01 above.
- C. Site:
 1. Unless otherwise specifically directed by Engineer:
 - a. Hose down all paved areas onsite and all public sidewalks directly adjacent to the Site.
 - b. Rake clean other surfaces of the grounds.
 2. Remove all resultant debris.
- D. Structures:
 1. Exterior:
 - a. Visually inspect all exterior surfaces.
 - b. Remove all traces of soil, waste material, smudges and other foreign matter.
 - c. Remove all traces of splashed materials from adjacent surfaces.
 - d. If necessary, to achieve a uniform degree of exterior cleanliness, hose down the exterior of the structure.
 - e. In the event of stubborn stains not removable with water, Engineer may require light sandblasting or other cleaning at no additional cost.
 2. Interior:
 - a. Visually inspect all interior surfaces.
 - b. Remove all traces of soil, waste material, smudges and other foreign matter.
 - c. Remove all traces of splashed materials from adjacent surfaces.
 - d. Remove all paint droppings, spots, stains and dirt from finished surfaces using only the specified cleaning materials and equipment.
 3. Glass: Clean all glass inside and outside.
 4. Polished surfaces: To all surfaces requiring the routine application of buffed polish, apply the specified polish as recommended by the Manufacturer of the material being polished.
- E. Timing: Schedule final cleaning as approved by Owner or Owner's representative to enable Owner to accept a completely clean Project.

END OF SECTION

SECTION 01 78 00
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes, but is not necessarily limited to, the procedures, submittals, responsibilities and requirements for Contract closeout.

1.02 Cleaning:

- A. General:
1. Manufactured products: Manufacturer's instructions.
 2. Clean-up during construction: Maintain premises and public properties free from accumulations of waste, debris and rubbish caused by operations.
 3. Final clean-up: Remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all surfaces; leave the Work clean and ready for occupancy.
- B. Delinquency:
1. Remedies: Failure to clean-up promptly is defective Work:
 - a. Owner may correct: ARTICLE 14 of SECTION 00 72 00 - GENERAL CONDITIONS.

1.03 WORK RECORD DOCUMENTS:

- A. Maintenance of Documents:
1. Maintain one (1) copy at jobsite in good order of:
 - a. Contract Drawings.
 - b. Specifications.
 - c. Addenda.
 - d. Reviewed shop drawings.
 - e. Change Orders.
 - f. Other Contract modifications.
 2. Filing: Work specification format.
 3. Accessibility: To Owner and Engineer.
- B. Recording:
1. Keep record documents current.
 2. Contract Drawings: Legibly mark to record actual construction:
 - a. Field changes of dimension and detail.
 - b. Changes made by Change Orders and Bulletins.
 - c. Details not on original Contract Drawings.
 3. Specifications and Addenda: Legibly mark up each SECTION to record:
 - a. Manufacturer, trade name, catalog number and supplier of products actually installed.
 - b. Changes made by Change Orders and Bulletins.
 - c. Other matters not originally specified.
- C. Submittal:
1. Delivery: To Engineer prior to final payment.

2. Transmittal letter: Contain:
 - a. Date.
 - b. Project title and number.
 - c. Contractor's name and address.
 - d. Title and number of each record document.
 - e. Certification that each document, as submitted, is complete and accurate.

1.04 LUBRICATION AND START-UP:

- A. General:
 1. Manufactured Products: Manufacturer's instructions.
 2. Lubricants: One-year supply manufacturer's recommended.

1.05 TOUCH UP AND REPAIR:

- A. General:
 1. Manufactured Products: Manufacturer's instructions.
 2. Field fabricated products: Appropriate SECTIONS.

1.06 OPERATION AND MAINTENANCE MANUALS:

- A. Submit as required by Contract Documents prior to final payment.

1.07 SUBSTANTIAL COMPLETION:

- A. Procedures and Requirements: Paragraph 15.03 of the General Conditions.

1.08 REMOVAL OF TEMPORARY SOIL EROSION CONTROL MEASURES:

- A. See Section 01 57 13 – Temporary Erosion and Sedimentation Control.

1.09 FINAL PAYMENT:

- A. Procedures and Requirements: See Agreement.
- B. Submit Affidavit and Consent of Surety prior to final payment.
- C. Submit Work record documents, O & M manuals, remove temporary soil erosion control measures or provide Letter of Credit of approved amount to guarantee removal by a later date, and complete all punch list items prior to final payment.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 SCHEDULES:

- A. Attached are the following forms:
 1. Certificate of Substantial Completion.
 2. Affidavit and Consent of Surety.
 3. Letter of Credit Form

END OF SECTION

CERTIFICATE OF SUBSTANTIAL COMPLETION
(on Engineer's Letterhead)

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

This [preliminary] [final] Certificate of Substantial Completion applies to:

All Work The following specified portions of the Work:

Date of Substantial Completion

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

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

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

Amendments to Owner's responsibilities:	Amendments to Contractor's responsibilities:
<input type="checkbox"/> None	<input type="checkbox"/> None
<input type="checkbox"/> As follows:	<input type="checkbox"/> As follows:

The following documents are attached to and made a part of this Certificate: *[punch list; others]*

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

EXECUTED BY Engineer:	RECEIVED:	RECEIVED:
By: _____ (Authorized Signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

STATE OF MICHIGAN)
) ss
COUNTY OF _____)

AFFIDAVIT

Notice to Contractor: This is a sample copy. Three completed copies of this form or similar form must be submitted to the Engineer before final payment will be recommended.

_____, Contractor

being duly sworn, deposes and says that he entered into an Agreement (Contract) with the _____ of _____ (Owner) on the _____ day of _____, 20____ for the performance of certain Work generally described as follows: _____

Contractor further says that the Work under the terms of the Contract has been completed and all sums due to Contractors, Subcontractors, suppliers and laborers with whom Contractor has contracted for performance under the Contract have been paid in full.

Furthermore, in consideration of final payment under the Contract, Contractor hereby waives and releases any and all claims or rights which Contractor may have in connection with the Contract against Owner or the premises upon which the Contract Work was performed, and agrees to indemnify Owner against any and all such claims or rights which may be asserted by Contractors, Subcontractors, Suppliers or laborers with whom Contractor has contracted for performance under the Contract.

WITNESSES:

Contractor: _____

Signature

Name and Title (Typed or printed in ink)

Subscribed and sworn to before me this ____ day of _____, 20____

Notary Public, _____ County _____

My commission expires: _____

CONSENT OF SURETY

The undersigned, as Surety on the above described Contract, hereby consents to the making of final payment to the Contractor under the Contract.

DATE: _____ SURETY COMPANY: _____

Signature (Attorney-in-fact)

Name and Title (Typed or printed
in ink)

(Attach copy of power of attorney certified to date of consent)

LETTER OF CREDIT FORM

Bank:

[Bank's Name and Address]

Irrevocable Standby Letter of Credit
Bank Reference No. _____
Issued: _____

Beneficiary:

[Owner's Name and Address]

Applicant:

[Contractor's Name and Address]

Project:

[Description of Project and remaining Work to be completed]

Date: _____
Expiration Date: _____ ***[as approved by Owner and Engineer]***
Amount: USD _____ ***[as approved by Owner and Engineer]***
Bank Reference No.: _____

Gentlemen:

We hereby establish our Irrevocable Standby Letter of Credit No. _____ in your favor for the account of **Applicant** up to an aggregate amount of USD _____ available by your draft(s) at sight drawn on **Bank**.

Drafts to be accompanied by the following document(s):

1. Beneficiary's written statement, stating: "**Applicant** has failed to satisfactorily install the **Project**."
2. Copy of Letter of Credit and any amendments.

Partial drawings are permitted.

Draft(s) must be marked "Drawn under **Bank** Irrevocable Standby Letter of Credit No. _____ dated _____."

We hereby agree with you that drafts drawn under and in strict compliance with the terms of this credit will be duly honored by us upon presentation at this office on or before our close of business on **Expiration Date**.

Except as otherwise expressly stated herein, this Letter of Credit is issued subject to the International Standby Practices of the International Chamber of Commerce ("ISP98"). This Letter of Credit shall be

deemed to be a contract made under the laws of the State of Michigan and shall, as to matters not governed by ISP98, be governed by and construed in accordance with the laws of the State of Michigan, other than its conflict of laws rules, which would result in the application of the law of any jurisdiction other than the laws of the State of Michigan.

Sincerely,

Bank

Authorized Signature

Printed Name and title

SECTION 02 41 00

DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY OF WORK:

- A. Section includes, but is not necessarily limited to, the demolition of existing pipes, equipment, concrete structures and buildings as indicated on the Drawings, as specified herein and as necessary for the proper and complete performance of the Work. Record Drawings of the existing structures are located within the Drawings.
- B. Regulatory Requirements:
 - 1. Conform to applicable code for demolition work, safety of structure and dust control.
 - 2. Obtain required permits from authorities.
 - 3. Notify affected utility companies before starting work and comply with their requirements.
 - 4. Do not close or obstruct egress width to exits.
 - 5. Do not disable or disrupt building fire, life safety, or municipal fire systems without 7-day prior written notice to the Owner.
 - 6. Comply with requirements of NFPA 241, "Safeguarding Construction, Alteration, and Demolition Operations".
 - 7. Conform to procedures applicable when discovering hazardous or contaminated materials.

1.02 DEFINITIONS:

- A. Terms:
 - 1. Abandon: Remove an item to the extent that it is not visible and does not interfere with new construction. Portions of the abandoned item may be left in place. No abandoned items shall be left below new footings.
 - 2. Fill and Abandon: Fill existing underground piping with flowable fill, cap pipe ends, and abandon in place.
 - 3. Abandon or Plug (Piping): Cap pipe ends and abandon in place.
 - 4. Demolish: Remove existing items from their present location in the Project area and haul to an area outside of the Project area. Remove utilities serving these items.
 - 5. Relocate: Move existing items from their present location to another location in the Project area. Extend utilities serving the present location to the new location.
 - 6. Remove: Remove existing items from their present location in the Project area and haul to an area outside of the Project area. Remove utilities serving these items.
 - 7. Replace: Remove existing items from their present location in the Project area, haul them to an area outside of the Project area, and furnish and install new items in the same or another location. Extend utilities serving the present location to the new location.
 - 8. Reuse: Move existing items from their present location to another location in the Project area. Extend utilities serving the present location to the new location.

1.03 SUBMITTALS:

- A. Pre-Construction:
 - 1. Demolition Schedule:
 - a. Anticipated demolition start date.

- b. Coordination of shutoff, capping and abandoning of existing utility services as required.
 - c. Proposed demolition sequence.
 - d. Demolition completion date.
2. Work Plan:
- a. Proposed equipment, methods and operations of demolition and modifications specified herein.
 - b. Proposed receiving location(s) of all materials to be hauled off site.
 - c. Proposed route(s) to receiving location(s) of all materials to be hauled off site.
 - d. Methods and procedures to be utilized to minimize soil erosion for heavy equipment and trucking operations.
 - e. All required State and Local permits.
- B. Post Construction:
- 1. Record Drawings:
 - a. Documents and witnesses accurately showing actual locations of capped utilities, subsurface obstructions, and other items which will be hidden after proposed construction activities.

1.04 PROTECTION:

- A. Existing Structures:
- 1. Demolition and disassembly will not be allowed until it is coordinated with Owner's operations.
 - 2. Maintain free and safe passage to and from buildings.
 - 3. Prevent movement or settlement of adjacent structures.
 - 4. Provide and place bracing, shoring and underpinning, and be responsible for safety and support of structures and assume liability for such movement, settlement, damage or injury.
 - 5. Cease operations and notify Owner or Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safe conditions are restored.
 - 6. All active utility mains traversing the project site shall be maintained.
 - 7. Do not close or obstruct any streets, sidewalks, alleys or passageways unless specifically authorized.
- B. Barricades:
- 1. Provide, erect and maintain barricades, lighting and guard rails as required by applicable regulatory agencies to protect occupants of building and workers.
 - 2. Provide temporary fencing for security if it is necessary to temporarily remove Owner's existing security fencing for access to the site. Obtain Owner's approval prior to removing any existing fencing.
- C. Coordination with local authorities:
- 1. Cooperate with local authorities and utility companies whose work affects or will be affected by the demolition operations. Ascertain the rules, regulations and requirements of these authorities that affect the demolition process: notify them of conditions affecting their work. Disconnect or arrange for disconnection of utility services if required.
 - 2. Comply fully with all provisions of the local codes, laws and ordinances applicable to work of this Section.

1.05 SEQUENCING AND SCHEDULING:

A. Scheduling:

1. Before commencing demolition work notify Owner or Owner's Representative and complete all modifications necessary to bypass the affected structure.
2. Follow this procedure for each individual demolition operation.

PART 2 - PRODUCTS

2.01 SALVAGED MATERIALS:

A. Ownership:

1. Owner shall have the option of retaining ownership of any or all existing equipment, materials, and items removed under this Work.
2. Specific items the Owner shall retain ownership of include, but are not necessarily limited to, the following equipment:
 - a. Basement Air Compressor.
 - b. Work Bench.
3. Should Owner decide not to retain ownership of certain items removed under the work of this Section, those items shall become property of Contractor and shall be promptly removed from the Project Site.

- B. Delivery: Deliver items which remain property of Owner to a location, or locations, as selected by Owner.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Permits: Obtain all necessary permits and provide a copy to the Owner prior to commencement of work.
- B. Safety: Be responsible for all safety requirements in accordance with the General Conditions.
- C. Convenience: Carry out demolition work to cause as little inconvenience to surrounding areas as possible.

3.02 DEMOLITION:

A. General:

1. Install all soil erosion and sediment control measures, if any, as indicated on the Drawings prior to any demolition work.
2. Remove all mechanical, electrical, piping, and miscellaneous equipment and appurtenances before commencing structural demolition.
3. It is the Contractor's responsibility to turn off all applicable utilities prior to demolition.
4. Each concrete structure to be abandoned below grade shall have a minimum 6" diameter hole cored through the bottom for every 50ft² of structure surface. Alternatively, the bottom of each tank may be broken up to the subgrade to provide an equivalent area as stated above.
5. The contract price will not be adjusted to repair demolition performed in excess of that required at no cost to Owner.
6. Do not use explosives in the work.

7. It is the Contractor's responsibility to maintain all access drives and roads utilized by construction/demolition traffic. This includes, but is not limited to, periodic street sweeping and repairing (patching/reconstructing) access drives and roads damaged by construction traffic.
- B. Filling and Abandoning Existing Underground Piping:
1. Where identified on the plans, fill the existing pipe completely with flowable fill. Plug both ends of the pipe. Abandon in place.
 2. Accurately record actual locations of capped utilities, subsurface obstructions, and other items which will be hidden after construction.
- C. Burning: Do not burn materials on Site.
- D. Stockpiling: On site stockpiles of demolished materials shall be removed from the site within 48 hours.
- E. Disposal of materials:
1. Remove contaminated, dangerous and other materials from Site and dispose of in accordance with applicable regulations.
 2. Arrange and pay for all required hauling, storage, collection and disposal. Contractor is responsible for any waste characterization that may be required by the waste receiver.

END OF SECTION

SECTION 03 01 40
CONCRETE REHABILITATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY:

- A. This Section includes the following:
 - 1. Removal of deteriorated concrete and reinforcement and subsequent replacement and patching.
 - 2. Epoxy crack injection.

1.03 SUBMITTALS:

- A. Product Data: For each type of product indicated, include material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.
- B. Samples: Cured samples of overlay and patching materials.
- C. Qualification Data: For installers.
 - 1. For products required to be installed by workers approved by product manufacturers, include letters of acceptance by product manufacturers certifying that installers are approved to apply their products.
- D. Material Certificates: For each type of product indicated, signed by manufacturers.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for bonding agents, patching mortars, and epoxy adhesives.
- F. Rehabilitation Program: For each phase of rehabilitation process, including protection of surrounding materials and project site during operations. Describe in detail materials, methods, equipment, and sequence of operations to be used for each phase of the work.
 - 1. If alternative materials and methods to those indicated are proposed for any phase of rehabilitation work, submit substitution request and provide a written description of proposed materials and methods, including evidence of successful use on other comparable projects, and a testing program to demonstrate their effectiveness for this project.

1.04 QUALITY ASSURANCE:

- A. Installer Qualifications: Installer who employs workers trained and approved by manufacturer to apply concrete patching and rebuilding materials, epoxy crack injection materials and polymer overlays.
- B. Manufacturer Qualifications: Manufacturer who employs factory-trained representatives who are available for consultation and project-site inspection.

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to project site in manufacturer's original and unopened containers, labeled with type and name of products and manufacturers.
- B. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.
- C. Store cementitious materials off the ground, under cover, and in a dry location.
- D. Store aggregates covered and in a dry location, where grading and other required characteristics can be maintained, and contamination avoided.

1.06 PROJECT CONDITIONS:

- A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.
 - 1. Use only Class A epoxies when substrate temperatures are below or are expected to go below 40 degrees F within 8 hours.
 - 2. Use only Class A or B epoxies when substrate temperatures are below or are expected to go below 60 degrees F within 8 hours.
 - 3. Use only Class C epoxies when substrate temperatures are above and are expected to stay above 60 degrees F for 8 hours.
- B. Cold-Weather Requirements for Cementitious Materials: Comply with the following procedures:
 - 1. When air temperature is below 40 degrees F, heat patching material ingredients and existing concrete to produce temperatures between 40- and 90-degrees F.
- C. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 degrees F and above.

PART 2 - PRODUCTS

2.01 BONDING AGENTS:

- A. Epoxy-Modified, Cementitious Bonding and Anti-Corrosion Agent: Product that consists of water-insensitive epoxy adhesive, Portland cements, and water-based solution of corrosion-inhibiting chemicals that forms a protective film on steel reinforcement.
 - 1. Products are subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, the following:
 - a. Sika Corporation; Armatec 110 EpoCem.
 - b. Approved equal.
- B. Epoxy Bonding Agent: ASTM C 881/C 881M, Type.
 - 1. Products are subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, the following:
 - a. Sika Corporation; Sikadur 32 Hi-Mod.
 - b. Approved equal.

2.02 PATCHING MORTAR:

A. Cementitious Patching Mortar:

1. Products are subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, the following:
 - a. Sika Corporation.
 - b. Approved equal.

2.03 CONCRETE:

- A. Concrete Materials and Admixtures: Comply with 03 30 00 Cast-in-Place Concrete.
- B. Steel and Fiber Reinforcement Accessories: Comply with 03 30 00 Cast-in-Place Concrete.
- C. Form-Facing Materials: Comply with 03 30 00 Cast-in-Place Concrete.

2.04 MISCELLANEOUS MATERIALS:

A. Overlays and Sealers:

1. Polymer Aggregate for use with epoxy, polymer, or polyurethane sealers shall be oven-dried, washed silica sand complying with ACIU 503.3.
2. Products are subject to compliance with requirements and shall be considered on a case-by-case basis upon shop drawing submittal; manufacturers submitted for consideration shall be those included in similar paragraphs of this specification.

B. Epoxy Crack Injection Adhesive: ASTM C 881/C 881M.

1. Products are subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, the following:
 - a. Sika Corporation; Sikadur 35 Hi-Mod.
 - b. Approved equal.

C. Capping Adhesive: Product manufactured for use with crack injection adhesive by same manufacturer.

D. Low-viscosity epoxy penetrating sealer recommended by manufacturer for application to exterior concrete traffic surfaces.

1. Sika Corporation; Sikadur 55 SLV.
2. Approved equal.

2.05 MIXES:

A. Mix products, in clean containers, according to manufacturer's written instructions.

1. Add clean silica sand and coarse aggregates to products only as recommended by manufacturer.
2. Do not add water, thinners, or additives unless recommended by manufacturer.
3. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.
4. Do not mix more materials than can be used within recommended open time. Discard materials that have begun to set.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Notify Engineer seven days in advance of dates when areas of deteriorated or delaminated concrete and deteriorated reinforcing bars will be located.
- B. Locate areas of deteriorated or delaminated concrete using hammer or chain drag sounding and mark boundaries. Mark areas for removal by simplifying and squaring off boundaries as directed by Engineer. At columns and walls make boundaries level and plumb, unless otherwise indicated.
- C. Locate at least three reinforcing bars using a pachometer, and drill test holes to determine depth of cover. Calibrate pachometer, using depth of cover measurements, and verify depth of cover in removal areas using pachometer.

3.02 PREPARATION:

- A. Protect people, motor vehicles, equipment, surrounding construction, project site, plants, and surrounding buildings from injury resulting from concrete rehabilitation work.
 - 1. Erect and maintain temporary protective covers over pedestrian walkways and at points of entrance and exit for people and vehicles unless such areas are made inaccessible during the course of concrete rehabilitation work. Construct covers of tightly fitted, 3/4-inch (19 mm) exterior-grade plywood supported at 16 inches (405 mm) o.c. and covered with asphalt roll roofing.
 - 2. Protect adjacent equipment and surfaces by covering them with heavy polyethylene film and waterproof masking tape or a liquid strippable masking agent. If practical, remove items, store, and reinstall after potentially damaging operations are complete.
 - 3. Neutralize and collect alkaline and acid wastes according to requirements of authorities having jurisdiction and dispose of by legal means off Owner's property.
 - 4. Dispose of runoff from wet operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
 - 5. Collect runoff from wet operations and dispose of by legal means off Owner's property.
- B. Shoring: Install temporary supports before beginning concrete removal.
- C. Concrete Removal:
 - 1. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch (13 mm). Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.
 - 2. Remove deteriorated and delaminated concrete by breaking up and dislodging from reinforcement. If a pre-extended repair mortar is used, depth must be 1" or greater.
 - 3. Remove additional concrete, if necessary, to provide a depth of removal of at least 1/2 inch (13 mm) over entire removal area.
 - 4. Where half or more of the perimeter of reinforcing bar is exposed, bond between reinforcing bar and surrounding concrete is broken, or reinforcing bar is corroded, remove concrete from entire perimeter of bar and to provide at least a 3/4-inch (19 mm) clearance around bar.
 - 5. Test areas where concrete has been removed by tapping with hammer and remove additional concrete until unsound and disbonded concrete is completely removed.

6. Provide fractured aggregate surfaces with a profile of at least 1/8 inch (3 mm) that are approximately perpendicular or parallel to original concrete surfaces. At columns and walls, make top and bottom surfaces level, unless otherwise directed.
 7. Thoroughly clean removal areas of loose concrete, dust, and debris.
- D. Reinforcing Bar Preparation: Remove loose and flaking rust from reinforcing bars by high-pressure water cleaning, abrasive blast cleaning or wire brushing until only tightly bonded light rust remains.
1. Where section loss of reinforcing bar is more than 25 percent, or 20 percent in 2 or more adjacent bars, cut bars and remove and replace as directed by Engineer. Remove additional concrete as necessary to provide at least 3/4-inch (19 mm) clearance at existing and replacement bars. Splice replacement bars to existing bars according to ACI 318, by lapping or using mechanical couplings.
- E. Surface Preparation for Sealers: Acid etch surface of concrete to produce a surface profile matching CSP 1 per ICRI 03732.
1. Remove excess acid solution, reaction products, and debris by squeegeeing or vacuuming.
 2. Scrub surface with an alkaline detergent, rinse, and squeegee or vacuum.
 3. Check acidity of surface with pH test paper and continue rinsing until pH is acceptable.
 4. When pH is acceptable and surface is clean, vacuum dry.

3.03 APPLICATION:

- A. General: Comply with manufacturer's written instructions and recommendations for application of products, including surface preparation.
- B. Epoxy-Modified, Cementitious Bonding and Anti-Corrosion Agent: Apply to reinforcing bars by stiff brush or hopper spray according to manufacturer's written instructions. Apply to reinforcing bars in two coats, allowing first coat to dry two to three hours before applying second coat. Allow to dry before placing patching mortar or concrete.
- C. Epoxy Bonding Agent: Apply to reinforcing bars and concrete by brush, roller, or spray according to manufacturer's written instructions, leaving no pinholes or other uncoated areas. Apply to reinforcing bars in at least two coats, allowing first coat to dry before applying second coat. Apply patching mortar or concrete while epoxy is still tacky. If epoxy dries, recoat before placing patching mortar or concrete.
- D. Patching Mortar: Unless otherwise recommended by manufacturer, apply as follows:
1. Wet substrate thoroughly and then remove standing water. Scrub a slurry of neat patching mortar into substrate, filling pores and voids.
 2. Place patching mortar by troweling toward edges of patch to force intimate contact with edge surfaces. For large patches, fill edges first and then work toward center, always troweling toward edges of patch. At fully exposed reinforcing bars, force patching mortar to fill space behind bars by compacting with trowel from sides of bars.
 3. For vertical patching, place materials in lifts of not more than 1 inch (25 mm) or less than 1/4 inch (6 mm). Do not feather edge.
 4. After each lift is placed, consolidate material and screed surface.
 5. Where multiple lifts are used, score surface of lifts to provide a rough surface for application of subsequent lifts. Allow each lift to reach final set before placing subsequent lifts.

6. Allow surfaces of lifts that are to remain exposed to become firm and then finish to a smooth surface with a wood or sponge float.
 7. Wet-cure cementitious patching materials, including polymer-modified, cementitious patching materials, for not less than seven days by water-fog spray or water-saturated absorptive cover.
- E. Epoxy Crack Injection: Comply with manufacturer's written instructions and the following:
1. Clean areas to receive capping adhesive of oil, dirt, and other substances that would interfere with bond, and clean cracks with oil-free compressed air or low-pressure water to remove loose particles.
 2. Place injection ports as recommended by epoxy manufacturer, spacing no farther apart than thickness of member being injected. Seal injection ports in place with capping adhesive.
 3. Seal cracks at exposed surfaces with a ribbon of capping adhesive at least 1/4 inch (6 mm) thick by 1 inch (25 mm) wider than crack.
 4. Inject cracks wider than 0.003 inch (0.075 mm) to a depth of 8 inches (200 mm) or to a width of less than 0.003 inch (0.075 mm), whichever is less.
 5. Inject epoxy adhesive, beginning at widest part of crack and working toward narrower parts. Inject adhesive into ports to refusal, capping adjacent ports when they extrude epoxy. Cap injected ports and inject through adjacent ports until crack is filled.
 6. After epoxy adhesive has set, remove injection ports and grind surfaces smooth.
- F. Polymer Sealer: Apply by brush, roller, or airless spray at manufacturer's recommended application rate.
1. Apply to traffic-bearing surfaces, including parking areas and walks.

3.04 FIELD QUALITY CONTROL:

- A. Testing Agency: Owner will engage a qualified testing agency to sample materials and perform tests as follows:
1. Patching Mortar, Packaged Mixes: One randomly selected sample tested according to ASTM C 928.
 2. Patching Mortar, Field Mixed: One randomly selected sample tested for compressive strength according to ASTM C 109/C 109M.
 3. Concrete: As specified in Section 03 30 00 Cast-in-Place Concrete.
 4. Joint Filler: Core drilled samples to verify proper installation.
 - a. Testing Frequency: One sample for each 100 feet (30 m) of joint filled.
 - b. Where samples are taken, fill holes with joint filler.
 5. Epoxy Crack Injection: Core drilled samples to verify proper installation.
 - a. Testing Frequency: One sample for each 100 feet (30 m) of crack injected.
 - b. Where samples are taken, fill holes with epoxy mortar.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY:

- A. The work includes all cast-in-place concrete except curb & gutter, sidewalk and sidewalk ramps, and driveways.

1.02 REFERENCES:

- A. ASTM - American Society Testing Materials, latest edition.
- B. ACI - American Concrete Institute, latest edition.
- C. CRSI – Concrete Reinforcing Steel Institute.
- D. MDOT - Michigan Department of Transportation, *“2020 Standard Specifications for Construction”*.

1.03 SUBMITTALS:

- A. Pre-Construction:
 - 1. Concrete Mix Designs:
 - a. Provide a concrete mix design for each mix of concrete prepared by an approved independent testing firm.
 - b. Select proportions according to ACI 301-72, Section 3.8, Method 1 or Method 2.
 - 2. Reinforcing Steel Schedule:
 - a. Drawings showing fabrication dimensions, sizes, and locations for placing the reinforcing steel and accessories.
 - b. Details of reinforcement and accessories shall be in accordance with ACI 315.
 - 3. Certifications:
 - a. Cement.
 - b. Aggregates.
 - c. Admixtures.
 - d. Reinforcement.
- B. Post Construction:
 - 1. Batch Tickets:
 - a. Documentation of mix type and volume with date and time stamp for each load.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Concrete:
 - 1. Cement: ASTM C150 or ASTM C595 (maximum fly ash content shall be 20% by weight). All cement used in exposed concrete shall be of the same brand from the same mill.
 - 2. Coarse aggregates: ASTM C33.
 - 3. Fine aggregate: ASTM C33.

4. Mixing water: Clean, fresh, and potable.
 5. Admixtures:
 - a. Air-entraining: ASTM C260.
 - b. Water-reducing, retarding, and accelerating: ASTM C494. Calcium chloride will not be permitted as an admixture.
 - c. Pozzolanic admixtures: ASTM C618, Type F or C, loss on ignition limited to 4 percent (4%).
- B. Reinforcement:
1. Bars: Deformed, ASTM A615 (S1), Grade 60.
 2. Welded wire fabric: ASTM A185.
- C. Accessories:
1. Tie wire: Sixteen (16) gauge annealed.
 2. Chairs, bar supports, bolsters, spacers: CRSI, Class C for structural slabs, Class A, for slabs-on-grade.
 3. Form ties: Commercially manufactured, water seal form ties with minimum 1-inch diameter steel or neoprene collar at mid-point for walls subject to hydrostatic pressure.
- D. Premolded Joint Filler:
1. ASTM D1751, non-extruding, bituminous.
- E. Latex Bonding Agent: W.R. Meadows "Intralok", L&M Construction Chemicals "Everbond", Sonneborn "Soncrete", or equal.
- F. Epoxy Bonding Agent: L&M Construction Chemicals "Permunitite", Sonneborn "Sonobond", Toch "Epotox 350", or equal.
- G. Vapor Barrier: 6 mil clear polyethylene film, below grade application.
- H. "Dry Shake" for Non-Slip Finish: Aluminum oxide type: L&M Construction Chemicals "Grip It", Toch "Toxgrip", Sonneborn "Frictex", or equal.
- I. Curing Compound:
1. White membrane for paving and curb: ASTM C309, Type 2.
 2. Transparent membrane for floors and structures: ASTM C309, Type 1-D, Class B.
- J. Damp proofing: Apply bituminous mastic spray coating to the exterior of the concrete walls. Apply to thickness specified by the manufacturer. Provide product submittal.
- K. Joint Sealant: Semi-rigid, non-tracking type: W.R. Meadows "Sealtight Gardox", or equal.
- L. Wall Finish: MasterSeal 581 applied according to manufacturer's instruction may be substituted for a grout cleaned finish.

2.02 PROPORTIONING CONCRETE:

- A. Proportions and Materials:
- Permissible Cement Types: I, 1L, IP, I-A, IP-A
 Minimum Cement Content: 5.5 sacks/cyd. for 3,500 psi, 6.0 sacks/cyd. for 4000 psi.
 Coarse Aggregate: MDOT 6A
 Sand: MDOT 902.08 and Table 902-4, 2NS
 Maximum Water-Cement Ratio: 5.0 gal./sack
 Entrained Air Content: five percent (5%) to eight percent (8%).

Maximum Slump: 3½-inch for floors and slabs on grade, 4 inches otherwise (individual batches may be ± ½ inch as long as the average of all batches is at or below maximum).

Minimum Compressive Strength, f'c (28 day):

Floors and slabs on grade: 4,000 psi

Structural concrete and concrete containing liquid: 4,000psi

Flatwork (curbs, sidewalks, drive approaches): 3,500psi

All other: 3,500psi

- B. Admixtures: Approval of ENGINEER required. Use in accordance with the manufacturer's instructions.
- C. If the Contractor intends to place concrete by pumping, the mix design shall be prepared in accordance with these specifications and the recommendations of ACI 304.

2.03 FABRICATING REINFORCEMENT:

- A. Fabricate in accordance with approved shop drawings and ACI 315.
- B. Reinforcing splices: Class B unless otherwise shown.

PART 3 - EXECUTION

3.01 PERFORMANCE:

- A. In accordance with the requirements of ACI 301, Chapters 4 through 13, 17 and 18.

3.02 FIELD QUALITY CONTROL:

- A. Field inspection and testing will be performed by a firm appointed and paid for by the OWNER. When additional testing of materials or concrete is necessary because of their failure by test or inspection to meet specification requirements, the cost of additional testing shall be paid for by the Contractor. Additional testing for early form removal shall also be paid for by the Contractor.
- B. Provide access to all portions of the work and any necessary assistance in obtaining and handling samples at the project or other material sources. Three concrete test cylinders will be taken for every 50 cubic yards, or fraction thereof, for each class of concrete place in any one day. One additional cylinder will be taken during cold weather concreting and be cured on the project site under the same conditions as the concrete it represents. One slump test will be taken for each set of cylinders taken.

END OF SECTION

SECTION 03 60 00

GROUTING

PART 1 - GENERAL

1.01 SUMMARY:

- A. The work includes the use of non-shrink grout for installing:
 - 1. Base plates, bearing plates, drilled-in anchor bolts, drilled-in reinforcing dowels, railing posts, or where called for on the Drawings.
- B. All grout shall be cementitious grout unless noted. Epoxy grout shall be used only where specifically called for on the Drawings.

1.02 SUBMITTALS:

- A. Pre-Construction:
 - 1. Product Data:
 - a. Manufacturer, product name, and mixing instructions for each type of grout used.
- B. Post Construction: None

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Cementitious Grout - Acceptable Products Include:

Trade Name	Manufacturer
Crystex	L&M Construction Chemicals, Inc.
Embeco 636	Master Builders
Ferrolith G-NC	Sonneborn Building Products
Five-Star Grout	U.S. Grout Corporation
Masterflow 713	Master Builders
Sauereisen F-100	Sauereisen Cements Company
SonogROUT	Sonneborn Building Products
Upcon Multi Purpose Grout (262)	Bostik, Upco Division

- B. Epoxy Grout - Acceptable Products Include:

Trade Name	Manufacturer
Concresive 1463	Adhesive Engineering Company
Upcon Epoxy Grout	Bostik, Upco Division
647 R Repair Grout	Ceilcote
Epoxy Grout 1-270	Permagile-Salmon Ltd.

- C. Flowable mix shall develop a minimum compressive stress of 6000 psi in twenty-eight (28) days for cementitious grout and 10,000 psi in twenty-eight (28) days for epoxy grout.

PART 3 - EXECUTION

3.01 PLACEMENT:

- A. Grout shall be mixed and placed per manufacturer's recommendations.
- B. All voids within area to be grouted must be filled.
- C. Strike-off grout cleanly and neatly. Rectify all defects.

END OF SECTION

SECTION 05 53 00

METAL GRATINGS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes, but is not necessarily limited to, the furnishing and installation of all galvanized gratings and related equipment as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.02 REFERENCES:

- A. Except as herein specified or as indicated in the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM Standard Specifications:
 - a. A 123 - Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
 - b. A 569 - Steel, Carbon (0.15 Maximum, Percent) Hot-Rolled Sheet and Strip Commercial Quality.
 - 2. ASTM Standard Practices:
 - a. A 780 - Repair of Damaged Hot-Dip Galvanized Coatings.
 - 3. NAAMM - National Association of Architectural Metal Manufacturers:
 - a. Metal Bar Grating Manual.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS:

- A. Design criteria:
 - 1. Live load: 100 pounds per square foot.
 - 2. Allowable deflection: 1/4-inch.

1.04 SUBMITTALS:

- A. Pre-Construction:
 - 1. Grating:
 - a. Dimension drawings of each grating piece with openings for penetrations.
 - b. Materials of construction and finishes.
 - c. Bar sizes and depths and opening sizes.
 - d. Design loads and deflection tables.
- B. Post Construction: None.

1.05 QUALITY ASSURANCE:

- A. Qualifications:
 - 1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the reviewed Shop Drawings.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Steel galvanized grating:
 - 1. Gripweld, dovetail-slot, J-slot or intermediate welded, Type IWA, IKG Industries or equal.
 - 2. ASTM A 569.
 - 3. Finish: Galvanized in conformance with ASTM A 123.
 - 4. Surface: Serrated.
- B. Grating anchorage:
 - 1. Manufacturer's standard saddle clips, four per panel.
 - 2. Bolts:
 - a. Self-drilling into steel.
 - b. Stud bolt field welded to steel.
 - c. Expansion bolts into concrete.
- C. Other materials:
 - 1. Other materials not specifically described but required for a complete and proper installation of the work of this Section shall be new, first quality of their respective kinds.

2.02 FABRICATION:

- A. Minimum size:
 - 1. Bearing bars: 1 inch by 3/16-inch.
 - 2. Cross bars: 4-inches on center maximum.
- B. Edges:
 - 1. Band grating edges with a flat of depth equal to the bearing bar depth.
- C. Penetrations:
 - 1. Band edges of openings greater than eight inches.

2.03 SOURCE QUALITY CONTROL:

- A. Reject grating panels with warpage causing greater than 1/16-inch difference in top elevation between adjacent panels.
- B. Replace with new materials meeting the requirements of this Section.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install grating in conformance with:
 - 1. The reviewed Shop Drawings.
 - 2. The Manufacturer's recommendations.

3.02 FIELD QUALITY CONTROL:

- A. Remove defective work and replace with materials that meet Specification requirements.

3.03 CLEANING:

- A. Clean materials installed under this Section in accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION

SECTION 08 30 10

ACCESS HATCHES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes but is not necessarily limited to the furnishing and installation of the major items listed below as indicated on the Drawings, as specified herein and as necessary for the proper and complete performance of the Work.
 - 2. Major items:
 - a. Reservoir access hatches.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS:

- A. Floor access hatches:
 - 1. Components including the assembled unit shall be designed for 150 pounds per square foot uniform load.

1.03 SUBMITTALS:

- A. Pre-Construction:
 - 1. Access Hatches:
 - a. Submit for each style and size.
 - b. Required information:
 - 1) Dimensions.
 - 2) Design loadings.
 - 3) Material specifications.
 - 4) Finishes.
 - 5) Fabrication details

- B. Post Construction: None.

1.04 QUALITY ASSURANCE:

- A. Qualifications:
 - 1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the reviewed Shop Drawings.
- B. Hatches shall be manufactured by a producer who has been in the business for not less than five years.

PART 2 - PRODUCTS

2.01 RESERVOIR ACCESS HATCHES:

- A. Water Reservoir: (2)
 - 1. Model: East Jordan FLS1 Flood Right Aluminum Hatch W/Infa Riser Gasket or equal.

2. Size: 2'-6" x 2'-6".
3. Style: Single.
4. Material: Aluminum.
5. Load: 625 psf.
6. Rim seal gasket with minimum compressible bulb of 11mm.
7. Padlock clip and padlock.
8. Provide with heavy duty pneumatic spring for ease of opening.
9. Coat aluminum which is to be in contact with concrete with a bituminous material.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install access hatches in conformance with:
 1. The Shop Drawings reviewed by ENGINEER.
 2. The Manufacturer's recommendations.

3.02 CLEANING:

- A. Prior to acceptance of the Work of this Section, clean all affected areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

3.03 PROTECTION:

- A. Protect surface of hatch during construction of remainder of the Project.

END OF SECTION

SECTION 09 96 00

HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and application of paint, stain and labeling products as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Work includes:
 - 1. Surfaces to be painted or finished including, but are not necessarily limited to, the following interior, concealed, and exterior surfaces for all items furnished or installed under this Work, except as otherwise indicated on the Drawings or herein specified.
 - a. Machinery and equipment.
 - b. Ferrous metals, structural steel.
 - c. Exposed pipe and fittings including wall and floor sleeves.
 - d. Exposed conduit and appurtenances (except conduit mounted on unpainted surfaces).
 - e. Immersed cast-in-place concrete
 - f. All other surfaces not specifically excluded in the following paragraph. A completely finished job is required, regardless of whether every individual item is mentioned herein or not.
 - 2. Surfaces not to be painted or finished including the following:
 - a. Manufacturer's name and identification plates.
 - b. Concealed ducts, pipes and conduits.
 - c. Galvanized steel.
 - d. Galvanized, aluminum or fiberglass grating.
 - e. Prefinished electrical and control panels with factory applied final finish.
 - f. Aluminum (unless indicated in the surface to be painted).
 - g. Door and window hardware.
 - h. Stainless steel (unless indicated in the surfaces to be painted).
 - i. Prefinished wall, ceiling and floor coverings.
 - j. Items with factory applied final finish, such as cabinets, anodized door and window frames, and the like, but excluding machinery and equipment.
 - k. Items indicated on the Drawings as not to be painted.
- C. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM Standard Practice:
 - a. A780 - Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 2. ASTM Standard Test Method:
 - a. D4263 - Indicating Moisture in Concrete by the Plastic Sheet Method.

3. ASME:
 - a. A13.1 - Scheme for the Identification of Piping Systems.
4. International Concrete Repair Institute Technical Guidelines:
 - a. 310.2 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
5. National Association of Pipe Fabricators, Inc.
 - a. NAPF 500-03 - Surface Preparation Standard for Ductile Iron Pipe and Fittings Receiving Special External Coatings and/or Special Internal Linings.
6. Society for Protective Coatings - Surface Preparation Standards and Specifications:
 - a. SSPC-SP3 - Power Tool Cleaning.
 - b. SSPC-SP5 - White Metal Blast Cleaning.
 - c. SSPC-SP6 - Commercial Blast Cleaning.
 - d. SSPC-SP7 - Brush-Off Blast Cleaning.
 - e. SSPC-SP10 - Near-White Blast Cleaning.
 - f. SSPC-SP11 - Power Tool Cleaning to Bare Metal.
 - g. SSPC-SP12 - Surface Preparation and Cleaning of Metals by Waterjetting Prior to Recoating.
 - h. SSPC-SP13 - Surface Preparation of Concrete.
 - i. SSPC-SP14 - Industrial Blast Cleaning.
 - j. SSPC-SP15 - Commercial Grade Power Tool Cleaning.
 - k. SSPC-VIS1 - Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning.
 - l. SSPC-VIS3 - Guide and Reference Photographs for Steel Surfaces Prepared by Hand and Power Tool Cleaning.
7. Society for Protective Coatings - Paint and Coating Standards and Specifications
 - a. SSPC-PA1 - Shop, Field, and Maintenance Painting of Steel.
 - b. SSPC-PA2 - Measurement of Dry Coating Thickness with Magnetic Gages.
 - c. SSPC-PA3 - A Guide to Safety in Paint Application.

1.03 DEFINITIONS:

A. Abbreviations:

1. DFT: Dry film thickness.
2. ICRI: International Concrete Repair Institute.
3. Mil: Thousandth of an inch.
4. PVC: Polyvinyl chloride.
5. FRP: Fiberglass reinforced plastic.
6. sf: Square feet.
7. DIP: Ductile iron pipe.

B. Terms:

1. Exposure: Environmental conditions to which different surfaces may be exposed are as follows:
 - a. Interior: All surfaces within the confines of a building or other enclosure not constantly exposed to weather, trapped moisture, high heat or other deteriorating conditions, and exposed to view.
 - b. Concealed: All surfaces within the confines of a building or other enclosure not constantly exposed to weather, trapped moisture, high heat or other deteriorating conditions, and normally concealed from view.
 - c. Immersed: Immersed surfaces include all surfaces below a water surface or exposed to spray. Surfaces exposed to spray include all areas to 8 inches above maximum water surface in quiescent tanks and to 18 inches above maximum water surface in mixed or agitated tanks. Also included as immersed surfaces are all floors, walls and the bottom side of the roof of an enclosed tank.

- d. Exterior:
 - 1) Above grade: All surfaces above finished grade and not included in a., b. or c. above.
 - 2) Below grade: All surfaces below finished grade and not included in a., b. or c. above.

1.04 SUBMITTALS:

- A. Manufacturer's literature:
 - 1. Submit specification data sheets and color charts for all materials proposed for use on the Work.
- B. Schedules:
 - 1. Submit a room finish schedule showing items or areas to be coated, the proposed coating system, including surface preparation, type, class and grade of abrasive used if any, primer, intermediate/finish coats, application methods and color charts.
 - 2. Schedule shall be submitted as a complete package.
- C. Manufacturer's certificates:
 - 1. Submit signed affidavit from coatings Manufacturer that submitted coatings are of same or better quality than those specified.
- D. Applicator's experience.
 - 1. Applicator shall have experience with the coating systems specified.
 - 2. Experience shall be substantiated by previous project experience, certifications, seminar attendance, Manufacturer validation or similar means.
- E. Product and maintenance schedules:
 - 1. At or before the Completion of the Work, submit complete lists, in a room finish schedule, of the products used. Include item covered, coating Manufacturer's name, type of coating and color.
 - 2. Provide pipe coding schedules listing pipe name, coating Manufacturer's name, type of coating and color.
 - 3. Provide maintenance manuals detailing the proper procedures and materials to be used for maintenance and repainting of the various coatings.
- F. NSF Certifications.

1.05 QUALITY ASSURANCE:

- A. General:
 - 1. Acceptability of materials and performance shall be determined by Owner or Owner's representative.
 - 2. Testing or certifications may be required to aid in the determination.
 - 3. Expense of testing and certifications when required and, unless noted otherwise in the Contract Documents, shall be borne by Contractor.
 - 4. If destructive testing is required, Contractor shall repair damaged area. Expense of repair shall be borne by Contractor.
 - 5. Request, in writing, a review of each coat by Owner or Owner's representative of first finished surface of each type for color, texture and workmanship. First accepted surface of each type and color shall be visibly labeled by Owner or Owner's representative with removable label as Project standard for that type and color of item. Labels shall remain in place until job is finished. For spray application, paint a surface of 100 square feet as Project standard.

6. Work may be inspected for proper surface preparation, pretreatment, priming, dry film thickness, curing, color and workmanship. Inspection equipment includes, but is not necessarily limited to the following:
 - a. Inspector's wet film and dry film thickness gages.
 - b. Zorelco 369/PHD pin hole detector.
 - c. Mark II Tooke Gage.
 - d. Keane-Tator Surface Profile Comparator.
 - e. Testex Press-O-Film and Micrometer.
 - f. Delmhorst Moisture Detector Model BD-7.
- B. Labeling:
 1. Include the following on a label on each container:
 - a. Manufacturer's name.
 - b. Type of coating.
 - c. Manufacturer's stock number.
 - d. Manufacturer's batch identification.
 - e. Color.
 - f. Instructions for mixing and reducing, where applicable.
 - g. Percent total solids by volume.
 - h. Identification of toxic substances and special instructions.
- C. It shall be Contractor's responsibility to ensure the compatibility of painting materials proposed for this Contract. Contractor shall coordinate this work with other trades to ensure compliance with these Specifications.
- D. Prior to ordering any of the materials of this Section, Contractor, Owner or Owner's representative, painting Subcontractor, and paint Manufacturer's representative shall attend a progress meeting in accordance with Section 01 31 19 – Project Meetings and review the work to be performed under this Section.
- E. Manufacturer's conditions report: Manufacturer's representative shall review environmental site conditions for surface preparation and coating application. Manufacturer's representative shall inform paint Subcontractor, Contractor, and Owner or Owner's representative of measures to be taken to ensure high quality coating performance.

1.06 DELIVERY, STORAGE AND HANDLING:

- A. Delivery:
 1. Deliver materials in original sealed containers of the Manufacturer with labels legible and intact.
- B. Storage:
 1. Store only acceptable Project materials on Project Site.
 2. Store material in a suitable location and in such a manner as to comply with all safety requirements including any applicable federal, state, and local rules and requirements. Storage shall also be in accordance with instructions of the paint Manufacturer and requirements of insurance underwriters.
 3. Restrict storage area to paint materials and related equipment.

1.07 PROJECT CONDITIONS:

A. Environmental requirements:

1. Comply with Manufacturer's recommendations regarding environmental conditions under which coatings may be applied.
2. Environmental conditions which affect coating application include but are not necessarily limited to ambient air temperature, surface temperature, humidity, dew point and environmental cleanliness.
3. Do not expose epoxies during application and cure to sunlight and heaters that emit carbon dioxide and carbon monoxide.
4. Contractor shall demonstrate acceptability of environmental conditions as required by Owner or Owner's representative.

B. Existing painted surfaces:

1. When painting is specified over existing painted surfaces and existing coating types are not known, Samples of existing coatings shall be analyzed by a laboratory approved by Owner or Owner's representative to determine generic type of coating present. A written report from the lab shall be submitted to Owner or Owner's representative before any coating is applied. Required modifications to painting schedule shall not be justification for extra payment.
2. Alternate method for steel, concrete or masonry: Remove existing coating by abrasive blasting obtaining surface cleanliness and profile required for coating specified. Paint as new surface.

1.08 MAINTENANCE:

A. Extra materials:

1. Leave with Owner at least one unopened gallon of each type and color of paint used for finish coats and one unopened gallon of each type of thinner required. Containers shall be tightly sealed and clearly labeled.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Acceptable Manufacturers:

1. Materials selected for coating systems for each type of surface shall be the product of a single Manufacturer.
2. Except as otherwise specified, materials shall be the products of the following Manufacturer:
 - a. Tnemec Company, Inc.
 - b. Sherwin Williams Company.
 - d. Carboline
 - e. Or equal

2.02 MATERIALS:

A. Reference Manufacturer:

1. Products specified are as manufactured by Tnemec Company, Inc., unless otherwise indicated; similar products of acceptable manufacturers listed in Article 2.01 may be furnished in lieu of those listed.

B. Material types:

1. Paint, primer and related materials are included by Manufacturer's product numbers in the Schedules in this Section.

C. Colors:

1. Colors of all finish coats shall be as selected by Owner or Owner's representative.

2.03 MIXES:

A. Mixing:

1. Paints shall be delivered to the Site ready-mixed, when this is possible.
2. Two-component paints may be mixed at the Site.
3. Mixing shall proceed until paint becomes smooth, homogeneous, and free of surface swirls or pigment lumps.
4. When mixing multi-component paints, remix each component individually, then blend the components, as recommended by the Manufacturer, until the mixture is completely uniform in color.

B. Thinning:

1. Thin first coat of paint applied to immersed concrete tank walls in accordance with Manufacturer's recommendations.
2. No other thinning will be permitted unless absolutely necessary.
3. Paint shall be spray-applied in as-received condition to demonstrate necessity for thinning.
4. Use only thinners as recommended by paint Manufacturer for specific use.
5. Amount of thinner used shall be reported to Owner or Owner's representative.
6. Measure viscosity to ensure proper thinning ratios have been used.

C. Tinting:

1. On-site tinting permitted only when acceptable to Owner or Owner's representative. Written approval required.
2. Use only tinting colors recommended by the Manufacturer for the specific type of coating.

2.04 PIPE MARKING:

A. Identification labels:

1. Labels and arrows shall be preprinted and manufactured by a company which normally manufactures pipe identification systems.
2. Materials:
 - a. Smooth-wall pipes: Self-adhesive vinyl markers.
 - b. Ductile iron pipe and smooth-wall pipes: Acrylic/Vinyl pre-formed plastic.
3. Arrow(s) to indicate flow direction.
4. Colors: ANSI Z53.1 - Safety Color Code for Marking Physical Hazards.

5. Identification label color scheme:

Pipe Contents	Color Scheme
Fire-quenching fluids	White text on red
Toxic and corrosive fluids	Black text on orange
Flammable fluids	Black text on yellow
Combustible fluids	White text on brown
Potable, cooling, boiler feed, and other water	White text on green
Compressed air	White text on blue
User-defined	White text on purple
User-defined	Black text on white
User-defined	White text on grey
User-defined	White text on black

6. Pipe marking labels shall be sized as follows:

Pipe or Insulation OD	Lettering Height	Minimum Marker Length
1-1/4" or smaller	1/2"	8"
1-1/2" to 2"	3/4"	8"
2-1/2" to 6"	1-1/4"	12"
8" to 10"	2-1/2"	24"
Larger than 10"	3-1/2"	32"

7. Manufacturers:

- a. Brady Worldwide, Inc.
- b. EMED Co., Inc.
- c. Seton Identification Products.
- d. Or equal.

B. Color bands:

1. Thickness: 5-mil.
2. Adhesive backed vinyl tape.
3. Resistant to water, oil, fungus and chemicals.
4. Bands shall be the following widths:
 - a. Pipe up to and including two-inch diameter: 3/4 inch wide.
 - b. Pipe 2-1/2-inch to 6-inch diameter: 1 inch wide.
 - c. Pipe 8-inch to 12-inch diameter: 2 inches wide.
 - d. Pipe 14-inch diameter and over: 4 inches wide.
5. Manufacturers:
 - a. 3M Company, Vinyl Tape 471.
 - b. Seton Identification Products, Pipe Banding Tape.
 - c. Or equal.

PART 3 - EXECUTION

3.01 EXAMINATION:

A. Inspection:

1. Prior to the commencement of surface preparation or other coating activities, thoroughly inspect the surfaces to determine if the Work is ready to be prepared and painted.
2. Report in writing to Owner or Owner's representative, all conditions that may potentially affect proper application.

3. Do not commence surface preparation or other coating activities until such defects have been corrected.

B. Correction of defects:

1. Correct defects and deficiencies in surfaces which may adversely affect work of this Section.

3.02 PREPARATION:

A. General:

1. Prepare surfaces in accordance with this article, the paint Manufacturer's recommendations and as specified in the painting schedule of this Section.
2. Cleanliness of abrasive blast-cleaned steel shall be determined by Owner or Owner's representative using SSPC-VIS-1, Visual Standard for Abrasive Blast Cleaned Steel. Small steel panels which have been abrasive blast-cleaned and approved for a specific cleanliness may be used for comparative purposes to facilitate inspection and approval. These panels shall be securely wrapped in clear plastic and sealed to protect them from deterioration and marked with appropriate cleanliness specification, i.e., SSPC-SP6.
3. Compressed air used for blasting shall be periodically checked to verify that it is clean, dry and oil-free by directing its flow toward a sheet of clean white paper. Oil and water separators shall be placed in the air line as close as possible to blast-cleaning equipment. Contaminated air shall not be used for blast cleaning.
4. Measure surface profile of abrasive blast-cleaned steel using a Keane-Tator Surface Profile Comparator or Testex Press-0-Film and Micrometer.
5. Abrasive media shall be selected to provide the type of profile required by the Manufacturer of the coating product. Abrasive media shall contain less than 1% free silica sand.
6. All motors, bearings, chain drives and other moving parts shall be protected by wrapping with plastic and sealing with tape. Protective covers shall be maintained in dust tight condition.
7. Steel and fabrication defects revealed by surface preparation, such as weld imperfections, delaminations, scabs and slivers shall be corrected by appropriate trade before proceeding further with surface preparation.
8. Dust and blast products shall be removed from the abrasive blast-cleaned surfaces by high pressure air or vacuum cleaning. Completely clean up all residues from blasting operations within the entire space to be painted prior to applying any coatings.
9. Surfaces shall be inspected after all surface preparation is complete and prior to application of any coatings.

B. Masonry walls:

1. New masonry walls shall cure for at least 28 days before coating.
2. Test walls for moisture content in accordance with ASTM D4263. Test consists of securely taping a 18-inch x 18-inch piece of 4-mil thick plastic film to the wall in various locations. The film shall be carefully sealed with tape to prevent the escape of moisture and shall remain in place for a minimum of 24 hours. If, after this period of time, moisture is present between the plastic and the wall, additional time for the walls to dry will be required. A Delmhorst Moisture Detector Model BD-7 may also be used.
3. Remove dirt, mortar, scale, powder and other foreign matter from masonry surfaces which are to be coated by scrubbing with a carborundum stone and/or a stiff brush.
4. Remove oil and grease with a solution of tri-sodium phosphate, rinse well and allow to thoroughly dry.

5. Remove stains from masonry surface caused by weathering of corroding metals with a solution of sodium metasilicate after being thoroughly wetted with water and allow to thoroughly dry.
 6. Coat masonry walls prior to installation of wall mounted equipment.
- C. Concrete:
1. New concrete shall cure for at least 28 days before coating.
 2. Test concrete for moisture content as specified in Article 3.02 B.2.
 3. Remove oil and grease with a solution of tri-sodium phosphate prior to the commencement of any coating or blasting activities.
 4. Prepare concrete surface to open up voids and cracks in accordance with the specification required for coating to be applied.
 5. Patch voids and cracks that will cause discontinuities in coating using a patching compound compatible with the coating system.
 6. Scrub concrete with stiff brush to remove loosely adhered patching compound.
 7. Concrete shall be clean and dry before coating.
- D. Ferrous metals:
1. Non-immersed ferrous metals:
 - a. Surface preparation - shop:
 - 1) Remove dirt, oil, grease and other foreign matter in accordance with SSPC-SP1 Solvent Cleaning.
 - 2) Abrasive blast clean surfaces to specification required for coating to be applied.
 - 3) Abrasive blast cleaning shall be done only when the relative humidity is no higher than 75% and the surface temperature of the steel is at least 5 degrees F above the dew point.
 - 4) Cleaned surfaces shall be coated before any visible rust forms on the surface. No cleaned surfaces shall be left uncoated for more than 24 hours.
 - 5) Apply coating as specified under this Section.
 - b. Surface preparation - field:
 - 1) Remove dirt, oil, grease and other foreign matter in accordance with SSPC-SP1 Solvent Cleaning.
 - 2) Prepare field welds by grinding to remove sharp edges, undercuts, recesses and pin holes. All weld slag and spatter shall be completely removed.
 - 3) All damages, scratches or abraded areas of shop primers and all field welds and all areas within 4 inches of field welds shall be cleaned before painting using surface preparation methods at least as effective as those specified for the structure itself.
 - 4) Feather out edges to make touch-up patches inconspicuous.
 - 5) Contractor may, at his option, clean and apply one overall coat of primer for each specified shop coat in place of touch-up or spot priming. Contractor shall meet all applicable surface preparation and application specifications herein.
 2. Immersed ferrous metals:
 - a. Surface preparation - field:
 - 1) Remove dirt, oil, grease and other foreign matter in accordance with SSPC-SP1 Solvent Cleaning.
 - 2) Prepare field welds by grinding to remove sharp edges, undercuts, recesses and pin holes. Weld slag and spatter shall be completely removed.
 - 3) Abrasive blast clean surfaces to specification required for coating to be applied.
 - 4) Abrasive blast cleaning shall be done only when the relative humidity is no higher than 75% and the surface temperature of the steel is at least 5 degrees F above the dew point.

- 5) Cleaned surfaces shall be coated before any visible rust forms on the surface. No cleaned surfaces shall be left uncoated for more than 24 hours.
 - 6) Apply coating as specified under this Section.
3. Ductile and cast-iron pipe and fittings:
 - a. Use the appropriate coating system for ferrous metals except the surface preparation shall be in accordance with NAPF-03 as follows:
 - 1) Pipe previously coated with asphaltic paint: NAPF-03-04 except no staining may remain on the surface after abrasive blast cleaning.
 - 2) Pipe not previously coated with asphaltic paint: NAPF-03-04.
 - 3) Fittings previously coated with asphaltic paint: NAPF-03-05 Blast Clean #1.
 - 4) Fittings not previously coated with asphaltic paint in immersed service: NAPF-03-05 Blast Clean #1.
 - 5) Fittings not previously coated with asphaltic paint in non-immersed service: NAPF-03-05 Blast Clean #3.
- E. Stainless steel:
 1. Prepare welds by grinding to remove sharp edges, undercuts, recesses and pin holes.
 2. Remove dirt, oil, grease and other foreign matter in accordance with SSPC-SP1 Solvent Cleaning.
 3. Use only solvents and cleaning solutions containing less than 200 ppm of halogens to prevent stress corrosion cracking.
 - F. Nonferrous metals and galvanized steel:
 1. Remove dirt, oil, grease and other foreign matter in accordance with SSPC-SP1 Solvent Cleaning.
 2. Remove white rust by hand or power brushing being careful not to damage or remove the galvanizing.
 3. Remove rust in accordance with SSPC-SP2 or SP3.
 4. On galvanized steel, touch-up damaged galvanized areas with one-package epoxy zinc-rich primer.

3.03 APPLICATION:

- A. General:
 1. All necessary safety precautions shall be taken in accordance with this Article, SSPC-PA Guide 3, Manufacturer's recommendations, federal, state, and local rules and requirements, and insurance underwriters.
 2. All coatings shall be applied in accordance with this Article, SSPC-PA1, and the Manufacturer's recommendations.
 3. Do not apply initial coating until moisture content of surface is within limitations recommended by paint Manufacturer. Moisture content shall be determined by one of the following methods.
 - a. As specified in 3.02 B.2. of this Specification.
 - b. By use of moisture meter approved by Owner or Owner's representative.
 4. Coating thickness:
 - a. Coats shall be applied in a uniform manner and of the minimum mil thickness as called for in painting schedule.
 - b. Maximum mil thickness shall be as recommended by coating Manufacturer.
 - c. Where the mil thickness is omitted, it shall be as recommended by coating Manufacturer.
 5. Sand and dust between each coat to remove defects visible from 5 feet.
 6. Following coats to be applied within recoat recommendation of the Manufacturer. Schedule inspection so as not to interfere with recoat time.

7. All coats shall be smooth, free of brush marks, streaks, laps or pile-up of paints and skipped or missed areas.
8. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
9. Coatings on all hollow metal units to be spray applied.
10. Finish door tops, edges and bottoms the same as face surfaces.
11. Except for contact surfaces, surfaces of fabricated assemblies that are inaccessible after erection shall receive all field coats of paint before erection.
12. All cracks and crevices shall be filled with paint if practical.
13. Wet paint shall be protected against damage from dust or other detrimental foreign matter as much as is practical.
14. Remove grills, covers, and access panels from mechanical and electrical systems from location and paint separately:
15. The interior surface of all ducts shall be painted black in the immediate area of all supply and exhaust grilles.
16. Coat masonry walls prior to mounting equipment.
17. After conditions of temperature and relative humidity have reached acceptable measures for applying coatings, those conditions must be conservatively estimated to remain in effect for 6-hours after coating application has stopped.

3.04 PIPE IDENTIFICATION:

- A. General:
 1. Non-buried piping installed as part of this Work shall be identified in accordance with this Section, as required in the Pipe Identification Schedule, and as indicated on the Drawings.
 2. Exposed, non-submerged pipes shall be labeled as to contents and direction of flow. Pipe concealed above suspended ceilings does not require painting or banding, but labels are required.
 3. Tanks, pumps, blowers, mixers and other process equipment shall be identified in accordance with Section 44 40 01 – Process Equipment Identification.
- B. Color bands: Install color bands spaced every 25 feet, before and after each valve and where pipe enters or leaves a wall.
- C. Labels and arrows:
 1. Pipe contents text shall be determined by Owner or Owner's representative.
 2. Place an arrow adjacent to every pipe label to indicate direction(s) of flow.
 3. Pipe labels shall be positioned so that they can be easily seen from the normal angle of approach - below the centerline of the pipe if the pipe is overhead, and above the centerline if the pipe is below eye level. Pipe labels shall be placed:
 - a. Adjacent to all valves.
 - b. Adjacent to all changes of direction.
 - c. On both sides of wall and floor penetrations.
 - d. At regular intervals on straight runs. Maximum acceptable spacing is 50 feet; closer spacing where necessary for visibility.
- D. Valves, fittings and supports:
 1. All valves and fittings shall be painted the same base color as the pipe they adjoin.
 2. Floor stands shall be painted the same base color as the pipe they adjoin.
 3. Wall brackets and pipe hangers shall be painted the same base color as the wall or ceiling they adjoin. Gray if wall or ceiling is not painted.

3.05 PHYSICAL HAZARDS IDENTIFICATION:

A. General:

1. Identify all physical hazards of the facilities constructed and installed under this Work.
2. Identify all physical hazards in accordance with the requirements and standards of OSHA Standard 1910, Section 1910.144 - Safety Color Code for Marking Physical Hazards, WPCF Manual of Practice No.1, and all governing state and local laws, ordinances and codes.
3. In the event of discrepancy between regulations and standards, the stricter requirements shall govern.

3.06 TRAFFIC MARKINGS:

A. General:

1. Parking spaces shall be marked with 4-inch wide lines as indicated on the drawings.
2. Marking paint shall meet Federal Specification GSA-FSS TT-P-115E type 1.

3.07 FIELD QUALITY CONTROL:

A. Inspection:

1. To facilitate painting and inspection, each coat of paint shall be of a different color or tint.
2. Finished metal surfaces shall be free of skips, voids or pinholes in any coat when tested with a low voltage detector.
3. Do not apply additional coats until completed coat has been inspected and acknowledged in writing by Owner or Owner's representative.
4. Only coats of paint acknowledged in writing will be considered in determining number of coats applied.

B. Final touch-up:

1. Any surface damage shall be repaired with touch-up paint matching material used for original coating.
2. All repaired areas shall be rubbed out and polished to match surrounding finish. Finish repair shall be of the quality typically found within the auto body industry.

3.08 CLEANING:

A. Remove spilled, splashed or spattered paint from all surfaces.

B. Do not mar surface finish of item being cleaned.

C. Prior to acceptance of the Work of this Section, thoroughly clean all painted surfaces and related areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

3.09 PROTECTION:

A. General:

1. Adequately protect other surfaces from paint and damage.
2. Repair damage as a result of inadequate or unsuitable protection.

B. Protective materials:

1. Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.

- C. Fire hazards:
 1. Place cotton waste, cloths, and materials which may constitute a fire hazard in closed metal containers and remove daily from site.
- D. Electrical plates and hardware:
 1. Remove electrical plates, surface hardware, fittings and fastenings prior to painting operations.
 2. These items are to be carefully stored, cleaned and replaced upon completion of work in each area.
 3. Do not use solvent to clean hardware that may remove permanent lacquer finish.
- E. Equipment with factory-applied final finishes:
 1. Certain equipment with factory-applied finishes may be accepted by Owner or Owner's representative at his discretion. The finishes of equipment with approved factory-applied final finishes shall be protected from scratches and abrasions by all practical means. Any surface damage shall be repaired with touch-up paint furnished by equipment manufacturer by workmen skilled in this type of work. All repaired areas shall be rubbed out and polished to match surrounding finish. Finish repair shall be of the quality typically found within the auto body industry. If damage to item is severe in the Judgment of Owner or Owner's representative, the equipment will be rejected or a new finish coat will be applied after proper surface preparation at the discretion of Owner or Owner's representative. In either case, no additional cost shall be incurred by Owner or Owner's representative.
 2. Equipment with non-acceptable factory finishes shall be repainted in accordance with these specifications.

3.10 PAINT SCHEDULE:

- A. The following schedule is based on Tnemec Company, Inc. except as noted. See paragraph 2.01 for other acceptable Manufacturers. See finish schedule for further information.

	<u>Mil DFT</u>
1. Interior ferrous metals - non-immersed: Epoxy system EP-1	
(Shop) Surface preparation: SSPC-SP6	
(Shop) First Coat: Series 161 Tneme-Fascure	3.0-5.0
(Field) Second coat: Series 66 Hi-Build Epoxoline	4.0-6.0
(Field) Third Coat: Series 66 Hi-Build Epoxoline	4.0-6.0
2. Ferrous Metals – Immersed (Mild Environment): Epoxy system EP-2	
(Field) Surface preparation: SSPC-SP10	
(Field) First coat: Series 66 Hi-Build Epoxoline	2.0-6.0
(Field) Second coat: Series 66 Hi-Build Epoxoline	2.0-6.0
3. Cast-in-place concrete –Immersed Surface: Aromatic Polyurethane Hybrid APH-1	
(Field) Surface preparation: SSPC-SP13/ICRI 310.2 profile 3-5	
(Field) First coat: Series L140 Pota-Pox Plus	4.0-6.0
(Field) Second coat: Series 406 Elasto-Shield	60-75

3.11 IDENTIFICATION SCHEDULE:

- A. All exposed, non-submerged pipes shall be identified with the following colors:

WATER LINES

Raw Water	Olive Green
Settled Water	Aqua
Finished Water (potable)	Dark Blue

CHEMICAL LINES

Alum	Orange
Chlorine	Yellow

WASTE LINES

Backwash Waste	Light Brown
Filter Drain	Light Brown
Sewer (Sanitary or Other)	Dark Gray

OTHER

Gas (natural, LPG)	Red
Gases (process)	Dark Green
Other lines	Light Gray
Concrete Tanks/Basins	White / Off-White

3.12 FINISH SCHEDULES:

A. Provide coating systems in accordance with the following schedules:

Finish Schedule			
Location	Equipment		Remarks
	Material	Coating	
Piping, Valves & Supports	Ferrous Metal / Non-Ferrous Metal	EP-1 / EP-2	
Flocculation/ Sedimentation Basin	Concrete	APH-1	Coat interior walls, floor, and ceiling
Filters	Concrete	APH-1	Coat all interior walls
Finished Water Reservoir	Concrete	APH-1	Coat all interior walls, columns, floor, and ceiling
Structural Steel	Ferrous Metal	EP-2	

END OF SECTION

SECTION 11 53 00

LABORATORY EQUIPMENT AND SUPPLIES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This section includes, but is not necessarily limited to, the furnishing, installation and delivery of all laboratory equipment as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 12345 - Laboratory Casework and Fixtures.
- C. Major Components include:
 - 1. Benchtop Incubator
 - 2. Autoclave

1.02 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 – Submittals.
- B. Shop Drawings:
 - 1. Required information:
 - a. General:
 - 1) Dimensions.
 - 2) Details of construction and installation.
 - 3) Detailed system schematic.
 - 4) Manufacturer's name and model number.
 - 5) Bill of Materials.
 - b. Equipment that requires power:
 - 1) Voltage.
 - 2) Current.
 - 3) Connections.
- C. Operation and maintenance manuals:
 - 1. Submit for all equipment.
 - 2. Required information:
 - a. Equipment function, normal operating characteristics and limiting conditions.
 - b. Assembly, installation, alignment, adjustment and checking instructions.
 - c. Operating instructions for start-up, routine and normal operating, regulation and control, and shutdown and emergency conditions.
 - d. Lubrication and maintenance instructions.
 - e. Guide to "troubleshooting".
 - f. Parts lists and predicted life of parts subject to wear.
 - g. Outline, cross-sections, assembly drawings, engineering data and wiring diagrams.
 - h. Test data and performance curves.

1.03 DELIVERY, STORAGE AND HANDLING:

A. Receiving and storage:

1. All materials shall be delivered in original, unbroken, brand marked containers.
2. Handle and store materials:
 - a. In a manner which will prevent:
 - 1) Deterioration or damage.
 - 2) Contamination with foreign matter.
 - 3) Damage by weather or elements.
 - b. In accordance with Manufacturer's directions.

B. Rejected material and replacements:

1. Reject damaged, deteriorated or contaminated material and immediately remove from the Site.
2. Replace rejected materials with new materials at no additional cost to OWNER.

2.01 GENERAL:

- A. All equipment shall be new, first quality of their respective kinds, and conform to these Specifications.

2.02 LABORATORY EQUIPMENT AND SUPPLIES SCHEDULE:

A. Incubator:

1. Manufacturers:
 - a. ThermoFisher
 - b. Quincy Lab
 - c. Or Approved Equal.

<u>Quantity</u>	<u>Item</u>	<u>Thermo Fisher Material Number</u>
1	Incubator	51028063 Model-IGS60
<u>Quantity</u>	<u>Item</u>	<u>Quincy Lab Product Number</u>
1	Incubator	12-140E

B. Autoclave

1. Manufacturers:
 - a. Tuttnauer
 - b. Or Approved Equal.

<u>Quantity</u>	<u>Item</u>	<u>Part Number</u>
1	Autoclave	2340

C. Turbidimeter

1. Type:
 - a. Wall mount for finished water and filter turbidimeter replacement.
 - b. Bench top for raw water installation.
2. Manufacturers:
 - a. HF Scientific
 - b. SWAN
 - c. Or Approved Equal.

2.03 TURBIDIMETERS

- A. General:
 - 1. Meter accuracy 2% of reading or +/- 0.02 below 40 NTU (whichever is greater), 5% of reading above 40 NTU.
- B. Meter Construction:
 - 1. Body material:
 - 2. Electrical enclosure type: ABS
 - 3. Power supply: 100-240 vAC, 47-63 Hz, 80VA
 - a. Power Cord to be supplied.
 - 4. Analog output signal 4-20mA.
- C. Measured Fluid:
 - 1. Maximum full-scale flow 0.26 gpm (1000 ml/min).
 - 2. Minimum flow 0.026 gpm (100 ml/min).
 - 3. Temperature range maximum 122°F (50°C), minimum 34°F (1°C).
- D. Design based on HF Scientific, SWAN or approved equal.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Delivery:
 - 1. All products shall be delivered in their original, unopened containers with all names, model numbers and labels clearly legible.
 - 2. Delivery inventory shall be witnessed by representatives of CONTRACTOR, OWNER and ENGINEER.
- B. Cleaning:
 - 1. All equipment shall be clean and free from damage and defects.

3.02 INSTALLATION:

- A. Install equipment in conformance with:
 - 1. The Shop Drawings reviewed by ENGINEER.
 - 2. The Manufacturer's recommendations.
- B. Turbidimeters:
 - C. Existing turbidimeters shall be removed prior to installation of new equipment.
 - D. Wall mounted turbidimeters shall be mounted in the same place as the old equipment.
 - E. Bench top turbidimeters shall be located in the lab of the Water Filtration Plan

END OF SECTION

SECTION 26 00 00

ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 SUMMARY:

A. Section includes:

1. This Section includes, but is not necessarily limited to the general provisions for all electrical work, as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.02 REFERENCES:

A. Applicable Standards and Codes:

1. Institute of Electrical and Electronic Engineers (IEEE).
2. Underwriters Laboratories, Inc. (UL).
3. National Electrical Manufacturers Association (NEMA).
4. National Electrical Code (NEC).
5. American Society for Testing and Materials (ASTM).
6. American National Standards Institute (ANSI).
7. National Board of Fire Underwriters (NBFU).
8. National Fire Protection Association (FPA).
9. National Electrical Contractors "Standard of Installation" (NECA)
10. Joint Industrial Council (JIC).
11. Code of Federal Regulations (CFR). Title 29 Labor, Subpart S-Electrical.

- ###### B. Where quantities, sizes, or other requirements shown on the Drawings or specified herein exceed the requirements of the above standards and codes, the Drawings and Specifications shall govern.

1.03 SUBMITTALS:

A. Pre-Construction:

1. Submit materials and equipment for review to Owner or Owner's Representative as required in each SECTION. Each sheet of descriptive literature submitted shall be clearly marked to identify the material or equipment and shall show the specification paragraph for which the equipment applies.
 - a. Submit schematics and connection diagrams for all electrical equipment. A manufacturer's standard connection diagram or schematic showing more than one scheme of connection will not be accepted unless it is clearly marked to show the intended connections.
 - b. Submittals showing more than the particular item under consideration shall have the pertinent description paragraph for which the equipment applies circled, or "high-lighted" with a marker intended for that purpose.
2. Provide records of insulation test [megohm check] on buried conductors in conduit.
3. After award of the contract and prior to starting any work the Contractor shall submit to the Owner or Owner's Representative:
 - a. List of Sub-Contractors scheduled and planned for utilization on the project.
 - b. Detailed work plan outlining methods, anticipated downtime and procedures to accomplish the intent and purpose of the Contract.
 - c. Work schedule detailing dates of principle events and completion date.

B. Post Construction:

1. Prepare and maintain Record Drawings current with work completed. Show all changes to underground and other hidden work. Submit to Owner or Owner's Representative on completion of project.
2. Operating and Maintenance Instructions:
 - a. Upon completion of all Work and tests, instruct the Owner in the operation and maintenance of all components.

1.04 CLEARANCES:

A. Equipment:

1. Maintain clearances from electric panels, and other electrical installations as required by NEC and CFR.
2. Maintain working clearances around electrical equipment as required for proper maintenance and operation.

1.05 IDENTIFICATIONS:

- A. Provide identification signs on all equipment, switches, breakers, and panels. Provide a type written circuit identification schedule in each distribution or branch circuit load center under glass or plastic. Each circuit shall be identified by load.
- B. Provide Arc Flash Labels Warning Labels on all meter socket enclosures, switchboards, panelboards, industrial control panels, and motor control centers in accordance with NEC 110.16.
- C. Provide Field Marking Labels on all meter socket enclosures, switchboards, panelboards, industrial control panels, and motor control centers in accordance with NEC 110.24. Field Marking shall include, but not be limited to, the maximum available fault current, the date the fault current calculation was performed and name of contractor performing the available fault current calculation.

1.06 CODES AND STANDARDS:

- A. These specifications are minimum requirements and shall govern except where made more stringent by other sections of this specification or local, state, or federal laws or regulations. In the event of conflict between these specifications and applicable codes and regulations, the codes and regulations shall govern.

1.07 ELECTRIC SERVICE APPLICATIONS:

- A. Electrical service is existing to be reused.

1.08 PERMITS, INSPECTIONS AND UTILITY CONNECTIONS:

- A. Obtain all necessary permits and pay all fees in connection with all permits, inspections, and approval by the proper authorities in local jurisdiction of such work. Final inspection by the OWNER will not occur until necessary certificates of satisfactory inspection are received.

1.09 DRAWINGS:

- A. Drawings and Specifications are provided for assistance to the CONTRACTOR and are diagrammatic only to indicate the general arrangement and location of circuits, outlets,

etc. Exact locations will be determined by field conditions. Deviations from the arrangement indicated to meet actual conditions shall be made with no expense to the OWNER. Throughout the progress of construction, the CONTRACTOR shall keep a set of detailed field record drawings, including the exact location of concealed work and underground utilities. This requirement does not authorize any deviations from the Contract Drawings without prior approval from the OWNER. The field record information shall be marked in a legible manner on prints of the Drawings. At the completion of work, the field record information shall be delivered by the CONTRACTOR to the OWNER.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. All electrical equipment and material shall be furnished new and shall be accepted, or certified, or listed or labeled or otherwise determined to be safe by a nationally recognized testing laboratory [NRTL].
 - 1. Commonly accepted NRTL's are Underwriters Laboratory, Inc. (UL) and Factory Mutual, Inc. FM.
 - 2. Equipment or material accepted certified, listed or labeled by an accepted NRTL shall be used in preference to equipment or material that does not have that acceptance.
- B. Substitutions for materials and equipment listed herein must be of equal standards, quality and desired operation, or superior. There will be no approval or consideration for approval of equipment or material submittals for substitution prior to Award of the Contract.
- C. All packaged equipment shall be completely factory wired prior to delivery to the job site. Connection to and bonding of this equipment is required under this section of the specifications.
 - 1. Check all prewired controls before energizing to verify that all internal wiring is properly coordinated to the voltage to be applied.

2.02 SHOP/FACTORY/FINISHING:

- A. Provide baked enamel finishes on exposed surfaces.
- B. Provide galvanized finishes for damp or wet locations.
- C. Touch up or refinish damaged paint.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Provide and install all equipment as specified, required or implied in this specification except as noted. This requirement shall include all labor, materials, and incidentals in a manner consistent with good practice necessary to a complete operable installation.
- B. Cooperation with other trades shall be implemented by the CONTRACTOR by his reference to the Civil and Structural Drawings and Specifications for work by other trades and to be carried on simultaneously or sequentially with the electrical work. This requirement is to facilitate construction to proceed with no harm to the OWNER due to the absence of cooperation. All other Drawings and Specifications shall become part of the Electrical Specifications as they relate to electrical work.

- C. Verify equipment dimensions to insure dimensional compatibility.
- D. All excavation, backfilling, and concrete work shall conform to the applicable Sections of these Specifications.
- E. The CONTRACTOR is responsible for connecting wiring and circuitry to all equipment furnished by others and the CONTRACTOR which requires electrical power or control.
- F. The CONTRACTOR shall demonstrate to the satisfaction of the OWNER at final inspection that the wiring is complete and free from open circuits, short circuits between circuits or ground and that systems operate satisfactorily. The entire electrical installation shall be demonstrated to operate in accordance with the specifications. The CONTRACTOR shall test feeders and panels to verify no ground faults exist and submit certified test data to the OWNER prior to final inspection. This test shall be made with no devices connected to prevent damage to equipment, and resistance shall be greater than one megohm.

3.02 TEST AND OPERATION:

- A. Equipment:
 - 1. Test and operate in accordance with manufacturer's recommendations.

3.03 CLEANING:

- A. Prior to acceptance of the work of this Section, thoroughly clean all related areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION

SECTION 26 05 19

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 SUMMARY:

A. Section includes:

1. This Section includes, but is not necessarily limited to, the furnishing and installation of low voltage electrical power conductors and cables as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.01 SUBMITTALS:

A. Pre-Construction:

1. Wire
 - a. Manufacturers literature
 - b. ASTM certifications for each type and size
2. Fiber Optic Cable
 - a. Manufacturers literature
3. Portable Cord
 - a. Manufacturers literature
 - b. UL Listing

B. Post Construction:

1. None

1.02 DELIVERY, STORAGE, AND HANDLING:

- A. Cable shall be on original reels or in boxes and shall be new and unused.
- B. Store cables in dry protected area and protect cable ends in accordance with manufacturer's recommendations.

1.03 DELIVERY, STORAGE, AND HANDLING:

- A. Cable shall be on original reels or in boxes and shall be new and unused.
- B. Store cables in dry protected area and protect cable ends in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.01 LOW VOLTAGE, LIGHTING AND POWER CONDUCTORS:

- A. Conductors provided on 120/240, 120/208 and 277/480 volt power and lighting systems to be stranded per ASTM B-8 soft drawn copper.
- B. Insulation system shall be type THHN/THWN rated 600V as defined and listed in Article 310 of NEC.

- C. On variable frequency drive outputs, insulation system shall be type XHHW-2 rated 600V as defined and listed in Article 310 of the NEC.
- D. Minimum size conductor utilized shall be #14 AWG for control circuits and #12 AWG for power and lighting circuits.
- E. Color code conductor insulation as follows:

Line Voltage	- Black
Grounding Conductor	- Green
Neutral	- White
Control	- Red
DC Circuits	- Blue
Voltage from External Source	- Yellow

Color shall be integral with the insulation compound applied by cable manufacturer.

2.02 INSTRUMENTATION CABLES:

- A. Instrumentation conductors shall be stranded copper conductors minimum size #18/2 AWG.
- B. Instrumentation conductors shall be paired and each pair twisted, and 100% shielded.
- C. Instrumentation cables to have minimum 300 volt insulation on each conductor and have a jacket overall.

PART 3 - EXECUTION

3.01 LOW VOLTAGE LIGHTING AND POWER CABLES:

- A. Install only after completion of work which might cause damage to wires or conduit.
- B. Clean out or replace conduit in which dirt, water, concrete, or other foreign matter has been allowed to accumulate, before installing wiring.
- C. Identify each end of each conductor by wire marking tape or sleeve. Mark on outer cover giving voltage, type, size and circuit number.
- D. Splices:
 1. No wire splices allowed in entire length of conduit or raceway.
 2. Make splices in electrical enclosures.
 3. Splice Insulation: Equal to original factory insulation. Underground splices shall be epoxy type. Water proof where below grade.
 4. Splicing Copper to Aluminum: Use aluminum-copper connections; approved as suitable for the purpose.
- E. Termination of Conductors:
 1. Insulated type compression or mechanical lugs.
 2. At distribution equipment containing aluminum bus bars; use aluminum copper lugs rated and approved for the application.
- F. Provide separate conduit for each type of circuit power and controls.
- G. Conductors terminating at outlets shall be left not less than 8 inches long within outlet box.

3.02 INSTRUMENTATION CABLE:

- A. Install only after completion of work which might cause damage to wires or conduit.
- B. Clean out or replace conduit in which dirt, water, concrete, or other foreign matter has been allowed to accumulate, before installing wiring.
- C. Splices: No wire splices allowed in entire length of conduit or raceway.
- D. Provide separate conduit for instrumentation circuits.
- F. Mark on outer cover the control loop number at each end and each conductor the wire number by wire marking tape or sleeve.

3.03 GROUPING OF CABLES:

- A. Lace or plastic band groups of feeder conductors at distribution centers, pullboxes, wireways.

3.04 WIRE PULLING:

- A. Use wire pulling lubricant for pulling No. 4 AWG and larger wire. Do not pull cables through conduit with more than allowable bends specified in NEC 345-11. Only approved pulling compound that is suitable for the type wire insulation is allowed.

3.05 CLEANING:

- A. Prior to acceptance of the work of this Section, thoroughly clean all related areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION

SECTION 26 05 26

GROUNDING

PART 1 - GENERAL

1.01 SUMMARY:

A. Section includes:

1. This Section includes, but is not necessarily limited to, the furnishing and installation of grounding as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.02 REFERENCES:

- A. IEEE Standard 142-1982.
- B. NEC - National Electrical Code, Article 250.

1.03 SUBMITTALS:

- A. Submit under provisions of Section 01 33 00 – Submittals.

PART 2 - PRODUCTS

2.01 GROUNDING ELECTRODE:

- A. Grounding electrodes are existing to be reused.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Bond the non-current carrying parts of all electrical equipment installed under this Contract including metallic raceways, raceway supports, motors, equipment enclosures, by means of bare copper cable to the wireway ground wire as shown on the Drawings.
- B. All power, lighting and receptacle circuit conduits shall include a ground conductor sized per the NEC. Attach grounding conductors to equipment by means of approved copper alloy solderless grounding lugs or clamps which shall be secured to the equipment and the grounding point by means of hexhead cap screws or machine bolts after the contact surfaces have been cleaned to bright metal.

3.02 CLEANING:

- A. Prior to acceptance of the work of this Section, clean all affected areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY:

A. Section includes:

1. This Section includes, but is not necessarily limited to, the furnishing and installation of conduit, tubing, surface raceways, wireways, outlet boxes, pull and function, boxes and handholes as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.02 REFERENCES:

A. American National Standards Institute:

2. ANSI C80.1 – Rigid Steel Conduit, Zinc Coated.
3. ANSI C80.3 – Specification for Electrical Metallic Tubing, Zinc Coated.

B. National Electrical Manufacturers Association:

1. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA FB 1 – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
3. NEMA OS 1 – Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
4. NEMA OS 2 – Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
5. NEMA RN 1 – Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
6. NEMA TC 2 – Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
7. NEMA TC 3 – PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.03 DESIGN REQUIREMENTS:

- ###### A. Minimum Raceway Size: 3/4" inch unless otherwise specified.

1.01 SUBMITTALS:

A. Pre-Construction:

1. Flexible metal conduit.
 - a. Manufacturer and product data for each product.
2. Liquidtight flexible metal conduit.
 - a. Manufacturer and product data for each product.
3. Nonmetallic conduit.
 - a. Manufacturer and product data for each product.
4. Flexible nonmetallic conduit.
 - a. Manufacturer and product data for each product.
5. Nonmetallic tubing.
 - a. Manufacturer and product data for each product.
6. Raceway fittings.
 - a. Manufacturer and product data for each product.
7. Conduit bodies.
 - a. Manufacturer and product data for each product.
8. Surface raceway.

- a. Manufacturer and product data for each product.
- 9. Wireway.
 - a. Manufacturer and product data for each product.
- 10. Pull and junction boxes.
 - a. Manufacturer and product data for each product.
- 11. Handholes.
 - a. Manufacturer and product data for each product.
- B. Post Construction:
 - 1. Record drawings
 - a. Record actual routing of all conduits. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Product Requirements: Product storage and handling requirements.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- C. Protect PVC conduit from sunlight.

PART 2 - PRODUCTS

2.01 METAL CONDUIT:

- A. Manufacturers:
 - 1. Carlon Electrical Products, Thomas & Betts, Walker Systems, Wiremold, or ENGINEER approved equal.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. Fittings and Conduit Bodies: Material to match conduit.

2.02 ELECTRICAL METALLIC TUBING (EMT):

- A. Manufacturers:
 - 1. Carlon Electrical Products, Thomas & Betts, Walker Systems, Wiremold, or ENGINEER approved equal.
- B. Product Description: ANSI C80.3; galvanized tubing.
- C. Fittings and Conduit Bodies: NEMA FB 1; aluminum set screw type.

2.03 LIQUIDTIGHT FLEXIBLE METAL CONDUIT:

- A. Manufacturers:
 - 1. Carlon Electrical Products, Thomas & Betts, Walker Systems, Wiremold, or ENGINEER approved equal.
- B. Product Description: Interlocked [steel construction with PVC jacket.
- C. Fittings: NEMA FB 1.

2.04 NONMETALLIC CONDUIT:

A. Manufacturers:

1. Carlon Electrical Products, Thomas & Betts, Walker Systems, Wiremold, or ENGINEER approved equal.

B. Product Description: NEMA TC 2; Schedule 40 PVC.

C. Fittings and Conduit Bodies: NEMA TC 3.

2.05 OUTLET BOXES:

A. Sheet Metal Outlet Boxes: NEMA OW 1, galvanized steel and EMT.

1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2-inch male fixture studs where required.
2. Concrete Ceiling Boxes: Concrete type.

B. Nonmetallic Outlet Boxes: NEMA OS 2.

C. Wall Plates for Finished Areas: As specified in Section 26 27 26.

D. Wall Plates for Unfinished Areas: Furnish gasketed cover.

E. Manufacturers:

1. Carlon Electrical Products, Thomas & Betts, Walker Systems, Wiremold, or ENGINEER approved equal.

2.06 PULL AND JUNCTION BOXES:

A. Manufacturers:

1. Carlon Electrical Products, Thomas & Betts, Walker Systems, Wiremold, or ENGINEER approved equal.

B. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

C. Hinged Enclosures: As specified in Section 26 27 16.

D. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:

1. Material: Galvanized cast iron.
2. Cover: Furnish with ground flange, neoprene gasket, and stainless-steel cover screws.

PART 3 - EXECUTION

3.01 EXAMINATION:

A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.02 EXISTING WORK:

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, plug conduit and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods [compatible with existing electrical installations, or as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.03 SYSTEM DESCRIPTION:

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground More than 5 feet from Foundation Wall: Provide rigid steel conduit riser to locations above grade. Provide cast metal boxes or nonmetallic handhole.
- C. In or Under Slab or Grade: Provide rigid non-metallic schedule 40.
- D. Inside chemical feed system containment area provide rigid non-metallic schedule 80.
- E. Outdoor Locations, Above Grade provide rigid metal.
- F. Indoor exposed locations provide rigid metal.
- G. Indoor exposed locations over 8' above finished floor provide EMT.
- H. Provide malleable aluminum conduit bodies and steel junction and pull boxes with NEMA rating according to area of classification.

3.04 INSTALLATION – GENERAL:

- A. Perform Work in accordance with the NEC and State of Michigan Electrical Code.
- B. Ground and bond raceway and boxes in accordance with NEC.
- C. Fasten raceway and box supports to structure.
- D. Identify all raceway and boxes.
- E. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.05 INSTALLATION – RACEWAY:

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Arrange raceway supports to prevent misalignment during wiring installation.
- C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- D. Group related raceway; support using conduit rack.
- E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports.
- F. Do not attach raceway to ceiling support wires or other piping systems.
- G. Construct wireway supports from steel channel.
- H. Route exposed raceway parallel and perpendicular to walls.
- I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- J. Route conduit in and under slab from point-to-point.
- K. Maximum size conduit in slab above grade: 1/2 inch.
- L. Maintain 6-inch clearance minimum between raceway and piping for maintenance purposes.
- M. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- N. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- O. Bring conduit to shoulder of fittings; fasten securely.
- P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- Q. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations.
- R. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams.
- S. Avoid moisture traps; install junction box with drain fitting at low points in conduit system in damp, wet or in-ground concrete vault locations.
- T. Install fittings to accommodate expansion and deflection on outdoor PVC conduits. where raceway crosses, control and expansion joints.
- U. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- V. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

- W. Surface Raceway: Install flat-head screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings.
- X. Close ends and unused openings in wireway.

3.06 INSTALLATION – BOXES:

- A. Orient boxes to accommodate wiring devices.
- B. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- C. In accessible ceiling areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- D. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- E. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
- F. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- G. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- H. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- I. Install adjustable steel channel fasteners for hung ceiling outlet box.
- J. Do not fasten boxes to ceiling support wires or other piping systems.
- K. Support boxes independently of conduit.
- L. Install gang box where more than one device is mounted together. Do not use sectional box.
- M. Install gang box with plaster ring for single device outlets.

3.07 INTERFACE WITH OTHER PRODUCTS:

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket.
- C. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.08 CLEANING:

- A. Prior to acceptance of the work of this Section, thoroughly clean all related areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION

SECTION 26 29 13.13

ACROSS THE LINE MOTOR CONTROLLERS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to; the furnishing and installation of across the line motor controllers as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.02 SUBMITTALS:

- A. Submit under provision of SECTION 01 33 00 – Submittals.
- B. Provide shop drawings for all motor starters including: outline, mounting dimensions and wiring diagrams.
- C. Provide Product Data including:
 - 1. Outline mounting dimensions and wiring diagrams.
 - 2. Component layout.
 - 3. Motor starter contactor.
 - 4. NEMA starter size.
 - 5. Control transformer.
 - 6. Overload relay.
 - 7. Overcurrent disconnect device data.
 - 8. Push buttons, selector switches, pilot lights.
- D. Provide operation and maintenance data including renewal parts for all starters. Include listing of each application showing motor nameplate details, starter size and type and overload heater sizing.

PART 2 - PRODUCTS

2.01 MANUAL MOTOR STARTERS:

- A. Manual starters shall be used only on single phase fractional horsepower motors.
- B. Toggle switch operated type equipped with melting alloy thermal overload relay which shall be one piece and allow use of interchangeable heater elements.
- C. Reset device to be trip free operation and render the starter inoperative if the interchangeable heater is removed.
- D. The "ON" position located up toward the top of the enclosure.
- E. Provide NEMA rated enclosure as shown on drawings for surface mounting.
- F. Enclosure to be equipped with handle guard and provision for padlocking in OFF position.
- G. Equipped with pilot light indicating when starter is in "ON" position.

- H. Starter shall have an operating contact pole for each ungrounded conductor.
- I. Acceptable Manufacturers: Westinghouse, Square D, or Allen Bradley.
- J. Or other approved equal by Engineer.

2.02 COMBINATION MOTOR STARTERS:

- A. Starters shall be NEMA Type rated to horsepower.
- B. Provide with thermal and magnetic circuit breaker with sized to motor horsepower. Provide padlocking in "OFF" position flange mounted disconnect switch. Operating voltage shall be as shown on drawings.
- C. Starters shall have enclosures rated to area of classification and as shown on plans. NEMA 4X starters shall be provided with stainless steel enclosures.
- D. Starter shall have double break silver alloy contacts through NEMA size 3.
- E. Coils to be molded construction.
- F. Provide melting alloy or bi-metal type thermal overload relays with replaceable and interchangeable heater modules which shall be removable from the front of the starter. Overload heater modules shall be included with each overload relay. Overload relays to be manually reset from front of starter enclosure and shall be "Trip Free" not allowing the overload relay control contacts to reclose or render harm to the overload relay if manual reset is attempted before cooling of the thermal element has occurred. Removal of the heater module shall render the starter inoperable. Provide auxiliary normally open or normally closed overload relay contacts as shown on drawings.
- G. Provide auxiliary normally open or normally closed auxiliary contacts as shown on drawings.
- H. Provide HOA, Pilot lights and all other pilot devices as shown on drawings.
- I. Provide a control circuit transformer of ample capacity to operate the control circuit at 120 volt. Control transformer shall include two (2) primary fuses and one (1) secondary fuse.
- J. Control circuits and relays shall be provided as shown on Drawings with contacts rated not less than 120 volts, 10 amperes.
- K. Mechanical interlocks shall be provided to prevent access to inside of starter cabinet by unauthorized personnel when switch is in ON position.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install in accordance with manufacturer recommendations and applicable codes.
- B. Furnish overload relay heaters to provide proper motor overload protection in accordance with NEC considering motor service factor, temperature rise, ambient temperatures and other applicable factors.

C. Connect controls in accordance with wiring diagrams.

3.02 CLEANING

A. Prior to acceptance of the work of this Section, clean all affected areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION

SECTION 26 29 23

VARIABLE-FREQUENCY MOTOR CONTROLLERS

PART 1 - GENERAL

1.01 SUMMARY:

- A. The work of this Section includes, but is not necessarily limited to; the furnishing and installation of adjustable frequency drive controllers for the purpose of varying the speed of motors as indicated on the Drawings, as specified herein and as necessary for the proper and complete performance of the Work.

1.02 REFERENCES:

- A. Applicable Standards and Codes:
 - 1. National Board of Fire Underwriters (NBFU).
 - 2. National Electrical Contractors "Standard of Installation" (NECA).
 - 3. Institute of Electrical & Electronic Engineers (IEEE).
 - 4. National Electrical Code (NEC).
 - 5. National Electrical Manufacturers Association (NEMA).
 - 6. National Fire Protection Association (NFPA).
 - 7. Underwriters' Laboratories, Inc. (UL).

2.02 SUBMITTALS:

- A. Pre-Construction:
 - 1. Variable Frequency Drive Controllers:
 - a. Provide detailed product data on each type of drive controller proposed. Data to be included:
 - 1) Design type with components used.
 - 2) Performance details including allowable electrical input parameters, speed regulation, power factor, harmonic output effect of harmonic to input line, operating temperature, required environment, minimum and maximum speed setting, linear acceleration and deceleration setting, other adjustments.
 - 3) Physical details including dimension and weights.
 - 4) Statement of warranty.
 - 5) Location of nearest in-warranty and out-of-warranty trained service labor and details of cost. Also include details on parts availability.
 - 6) Complete circuit diagrams.
 - 7) Complete spare parts listing with present current pricing.
 - 2. Field Service Technician Qualifications:
 - a. Submit resumes and qualifications of each field service technician working on the project including start up, field testing, training and certifications as specified.
- B. Post Construction:
 - 1. As-Constructed Wiring and Connections:
 - a. Provide as constructed detailed wiring and connection data.

PART 2 - PRODUCTS

2.01 ADJUSTABLE FREQUENCY DRIVE CONTROLS:

- A. Provide heavy duty constant torque, solid state AC adjustable frequency controllers to provide stepless variable speed over a 30% to 100% of motor base, 60 hertz, speed range.
- B. Provide custom designed control circuits for each drive assembly as shown on the drawings.
- C. Speed regulation with 100 percent load change shall be within 3 percent of maximum speed.
- D. Power factor of motor and controller combined shall be a minimum of 0.90 lagging over entire speed and load range.
- E. Service factor of combination motor and controller shall be a minimum of 1.15.
- F. Designed to operate on 480 volt AC (-5 percent, + 10 percent] 3 phase, 60 Hertz (+ 2 percent) input.
- G. Control Signal: 4-20 ma.
- H. Input Protection:
 - 1. Phase sequence protection.
 - 2. Protection during single phasing or loss of input.
 - 3. Undervoltage trip provides shutdown in event of power drop or interruption. Automatic reset. (Auto restart in ON position).
 - 4. Input fusing, provide thermal magnetic line circuit breaker with door or flange mounded lockable disconnect switch.
 - 5. Current limit, adjustable 100 percent - 50 percent of rated motor current.
 - 6. Transient suppression protects components from line notching and spikes.
 - 7. Input current shall not exceed 150 percent of motor full load current at start up.
 - 8. 3 percent line side reactor. DC chokes are not acceptable equal to line reactors.
- I. Nominal Output Power:
 - 1. The Adjustable Frequency Drive(s) shall be rated for the HP, full load amperes and rpm of the motors. The inverter(s) shall be microprocessor-based static adjustable frequency controller(s) designed to provide continuous speed adjustment of three-phase motors. In the event of motor and pump critical speeds the drive control shall have the capability of being programmed to quickly "drive through" or avoiding prolonged operation at the critical speed. The adjustable frequency output voltage shall provide constant volts-per- Hertz excitation to the motor terminals up to 60 Hertz. The AC current output when connected to its motor shall have a maximum harmonic content of 5% of base frequency.
 - 2. The Adjustable Frequency Drive shall be capable of sustaining a 150% torque overload for one minute period in order to allow for breakaway torque.
- J. The Adjustable Frequency Drive (VFD) shall be of modular construction and Pulse Width Modulated (PWM) design and shall include the following basic capabilities.
 - 1. Designed in protection against overloads, output short circuits, ground faults and ac line disturbances. Any kind of fault in the driven motor or motor circuit conductors shall not cause damage to the drive control.

2. Diagnostic/troubleshooting capability.
 3. The minimum VFD efficiency shall be 95% at 100% speed and 87% at 60% speed.
 4. The inverter shall be rated for an ambient temperature of 0 degrees C to 40 degrees C, and altitude of up to 3,300 feet above sea level and humidity of 0 to 95% non-condensing. All components shall have an anti-corrosion coating.
 5. 20-60 Hertz continuous operating range with standard motor. Harmonic content - 5 percent of fundamental maximum.
 6. Utilize insulated gate bi-polar transistor (IGBT) with PWM output technology.
- K. Output Power Control and Protection:
1. Instantaneous Overvoltage Trip:
 2. VFD must be capable of withstanding ground faults and short circuit faults on the motor load side without damage to the VFD.
 3. Instantaneous static over-current trip.
 4. Fault sensing and trip circuit with manual reset.
 5. Over-speed trip.
 6. Module over-temperature trip.
- L. Control Features:
1. Provide all pilot devices and control relays as shown on drawings.
 2. Provide 115V AC control power for operator devices.
 3. Provide unidirectional operation, coast to rest upon stop.
 4. Provide linear independent timed acceleration and deceleration, adjustable.
 5. Provide adjustable full time torque limit throughout the operating range.
 6. Provide 20 to 60 Hertz constant torque operation for all pumps and aerators/rotors.
 7. Provide 20 to 60 Hertz variable torque operation for all fans.
 8. Provide adjustment as follows:
 - a. Minimum speed - 20 to 40 Hz
 - b. Maximum speed - 40 to 60 Hz
 - c. Torque limit - 50 - 150%.
 - d. Low frequency boost - 0 to 60 Volts
 - e. Volts per Hertz - Adjustable from 3.83 to 11.5 volts per Hertz.
 - f. Stability adjustment.
 - g. Shall be capable of programmable segmented starting and stopping with two individual ramp times for both starting and stopping. Drives using I/O for this function will be rejected.
 9. Provide the following features:
 - a. Automatic restart upon return of power following an electric source outage.
 - b. Electrical isolation between the power and logic circuit, as well as between the 115 V AC control power and the static digital sequencing.
 - c. Door mounted operator accessible diagnostic display of over-frequency, instantaneous overcurrent, DC overvoltage, AC undervoltage/ loss-of-phase, emergency stop, overload, overtemperature, inverter trip.
 - d. Process instrument follower control for a 4-20 mA DC control signal.
- M. Cabinets: NEMA 1 enclosures.
1. All VFD power and control components shall be mounted on a sub-panel mounted on the inside back of the cabinet. This shall include but not be limited to VFD, reactors, disconnect switch, circuit breakers and fuses, transformers relays and contactors. No components may be mounted in the inside sides of the cabinet. This requirements excludes pilot devices, HMI and disconnect handles that are required to be mounted on the cabinet door.
Cabinet shall be welded finished steel with no removable back, top or side panels

- N. Provide one (1) set of manufacturer's recommended spare parts for VFD. At a minimum include following spare parts:
 - 1. One set all fuses.

- O. Acceptable Manufacturers:
 - 1. Toshiba
 - 2. Allen Bradley
 - 3. Danfoss
 - 4. GE
 - 5. Eaton
 - 6. Yaskawa
 - 7. ABB
 - 8. Mitsubishi
 - 9. Square D
 - 10. ENGINEER approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install all equipment in accordance with Drawings and Specifications, manufacturer's recommendations, and applicable codes and regulations.

3.02 START-UP AND OPERATOR TRAINING:

- A. Provide the services of an experienced competent service engineer for a minimum of (1) 4-hour day per drive not including travel time for start up assistance. **Service engineer must be a direct employee of the Drive Manufacturer, not an employee of the Drive Manufacturers Distributor.** Base bid on no more than (2) drive start ups per day. Service engineer shall be responsible for:
 - 1. Checking the installation including wiring and connections.
 - 2. Setting the adjustments on the drive control.
 - 3. Executing a complete drive start up demonstrating the operation of the equipment to the OWNER.
 - 4. Making field adjustments to drive programming paramaters as directed by ENGINEER.

- B. It is the responsibility of the CONTRACTOR to be certain that the service engineering specified time is adequate since start ups of each VFD will be at different times. The cost for additional time if required shall be responsibility of the CONTRACTOR.

3.03 CLEANING:

- A. Prior to acceptance of the work of this Section, thoroughly clean all installed materials, equipment and related areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

3.04 START UP PROGRAMMING SETTINGS:

A. Program each variable frequency drive to the following settings at a minimum.

MOTOR LOAD	Max Speed (Hz)	Min Speed (Hz)	On Ramp 1 Range (Hz)	On Ramp 1 Time (Sec)	On Ramp 2 Range (Hz)	On Ramp 2 Time (Sec)	Off Ramp 1 Range (Hz)	Off Ramp 1 Time (Sec)	Off Ramp 2 Range (Hz)	Off Ramp 2 Time (Sec)	Overload
Low Service Pump 1	60	*40	0-30	1	31-60	5	60-31	5	CTS	NU	Motor NP
Low Service Pump 2	60	*40	0-30	1	31-60	5	60-31	5	CTS	NU	Motor NP

* Final
Adjustment at
start-up
CTS - Coast to Stop
NP - Nameplate
NU - Not Used

END OF SECTION

SECTION 26 60 03

WATER TREATMENT PLANT CONTROL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. This Section includes, but is not necessarily limited to, the furnishing and the installation of the control hardware and instrumentation for the Water Treatment Plant Modifications. Existing SCADA system shall be reused but modified as shown on the drawings and described in the specifications. Major work items are described below:
 - a. Provide instrumentation.
 - b. Modify existing SCADA MTU Panel by Owners Systems Integrator.
 - c. Start up new controls.
 - d. Provide all necessary instrumentation and software to make a completely functional SCADA system.
 - e. Other major items listed below and as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

B. Related Sections:

1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. All pertinent Sections of Division 26 - Electrical.

1.02 OWNERS SYSTEMS INTEGRATOR (OSI) ALLOWANCE:

- A. Owners Systems Integrator is responsible for all labor, programming and materials indicated in this specification associated with the existing SCADA MTU modifications as described in this specification and shown on drawings.
- B. Owners Systems Integrator shall work with the CONTRACTOR to provide a completely functional SCADA system.
- C. Owners Systems Integrator shall be Kerr Pump and Supply, Oak Park Michigan. Mr. Darick Husken (231) 248-543-3880.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittals.
- B. Shop Drawings: The CONTRACTOR and OSI shall submit to the ENGINEER, Drawings cut sheets and other documents for the ENGINEER'S approval prior to manufacture and/or assembly of the system.
Submit for all SCADA Equipment and Instrumentation:
 1. General:
 - a. Dimensions.
 - b. Details of construction and installation.
 - c. Detailed system schematic.
 - d. Manufacturer's name and model number.
 - e. Bill of Materials.

- f. Existing SCADA MTU wiring diagrams including electrical connections to related field equipment.
 - g. Proposed MTU HMI screen updates.
- C. Product Data: Provide data for each component specified showing electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.
- E. AS-BUILT DRAWINGS
- 1. Prior to final payment, the Owners Systems Integrator shall submit as-built Drawings of the system that was installed. The as-built Drawings shall include connection and schematic diagrams of all panel and field wiring. The Drawings shall include schedules showing the terminal and wire number at each terminal point, both internal and external to panels.
 - 2. The as-built Drawing shall fully and accurately reflect any and all modifications made to the system during the course of installation or start-up.

1.04 REFERENCES

- A. Applicable Standards and Codes:
- 1. American National Standards Institute [ANSI]
 - 2. American Water Works Association [AWWA]
 - 3. American Society for Testing & Materials [ASTM]
 - 4. Institute of Electrical & Electronic Engineers [IEEE]
 - 5. Instrument Society of America [ISA]
 - 6. National Electrical Code [NEC]
 - 7. National Electrical Contractors "Standard of Installation" [NECA]
 - 8. National Electrical Manufacturers Association [NEMA]
 - 9. Factory Mutual [FM]
 - 10. National Board of Fire Underwriters [NBFU]
 - 11. National Fire Protection Association [NFPA]
 - 12. Underwriters' Laboratories, Inc. [UL]
 - 13. Occupational Safety and Health Administration [OSHA]
 - 14. FCC Part 15.247
 - 15. UL/CUL Standard 508 A, Industrial Control Equipment

1.05 WATER TREATMENT SYSTEM CONTROL SEQUENCE OF OPERATIONS:

- A. CONTROL SEQUENCE MODIFICATIONS: **(OSI)**
- 1. The existing water treatment plant control sequence shall be reused by the OSI.
 - 2. The following changes shall be made.
 - a. Add the following display icons to the OIT screens at the Water Treatment Plant.
 - 1) Dynamic Static Mixer Running
 - 2) Filter 1 Level 0-15'
 - 3) Filter 2 Level 0-15'
 - 4) Filter 3 Level 0-15'
 - 5) Raw Water Wet Well Level 0-15'
 - 6) Filter 1 Turbidity 0-100 NTU
 - 7) Filter 2 Turbidity 0-100 NTU
 - 8) Filter 3 Turbidity 0-100 NTU
 - 9) Raw Water Turbidity 0-100 NTU

3. Provide Well House 4 RTU PLC with the following I/O:
 - a. Dynamic Static Mixer Running (DI)
 - b. Filter 1 Level (AI)
 - c. Filter 2 Level (AI)
 - d. Filter 3 Level (AI)
 - e. Filter 4 Level (AI)

4. Provide the following alarms to be displayed on the OIT at the Water Treatment Plant. Setpoints shall be operator adjustable.
 - a. Filter 1 High Level Alarm – 10.5'
 - b. Filter 2 High Level Alarm – 10.5'
 - c. Filter 3 High Level Alarm – 10.5'
 - d. Raw Water Wet Well Low Level Alarm – 4.75'
 - e. Raw Water Wet Well High Level Alarm – 12.1'

5. Program the SCADA system dialer to provide a notification to the owner when any of the alarms in 4 a. through g. above.

PART 2 – PRODUCTS

2.01 EXISTING SCADA MTU MODIFICATIONS: (OSI)

- A. Materials and methods indicated below shall be followed by the OSI in the modification of the existing SCADA MTU Panel.

2.02 RELAYS: (CONTRACTOR AND OSI)

- A. Time Delay:
 1. Electric type.
 2. Delay on energize as necessary.
 - a. Minimum contact rating 1 ampere at 120 volt A.C.
 - b. Design based on Diversified Electronics TSC-100 Series or ENGINEER approved equal.

- B. Control:
 1. Miniature plug-in type.
 2. Minimum contact rating 10 ampere at 120 volt A.C. with necessary contacts as shown on drawings.
 3. Design based on Square D or ENGINEER approved equal.

2.03 SELECTOR SWITCHES AND PUSHBUTTONS: (CONTRACTOR AND OSI)

- A. All selector switches and push buttons shall be oil tight NEMA Type 13, with contacts, colors, and legend plates as indicated on Drawings. Manufacturer shall be Allen-Bradley, Bulletin 800T or ENGINEER approved equal.

- B. Pilot lights shall be transformer push-to-test type. Same type and brand as push buttons.

2.04 EXISTING SCADA MTU (OSI)

- A. OSI shall program existing SCADA MTU to perform the control functions described in part 1 above.

- B. All control panels shall be wall mount or floor mount as shown on plans, with components, and other instrumentation necessary for the operation described on the drawings and specifications.
- C. Enclosure shall be Hoffman or approved equal with NEMA 1 minimum.
- D. Before painting, thoroughly clean all surfaces, grind smooth all projections. Fill and sand any imperfections on surface. Apply one coat primer to all surfaces followed by two coats of primer to exterior surfaces. Apply one finish coat, air drying white lacquer to interior surfaces and 2 coats air drying lacquer to exterior surfaces in color to be selected by OWNER.
- E. No variations in layout, dimensions or electrical design shall be allowed without prior consent of ENGINEER.
- F. Nameplates shall be 3 ply, white laminated plastic with engraved black lettering.
- G. All wiring installation shall be executed in a workmanlike manner, and shall be grouped, bundled, supported and routed horizontally and vertically, to provide neat appearance. All connections to devices remote from the panel shall be executed through terminal boards.
- H. All internal panel wiring and terminations shall be designed in accordance with the latest applicable standards of the National Electric Code (NEC) as well as applicable state and local electrical codes. The minimum wire size is #14 AWG except for internal circuits using 5 VA or less #16 AWG is acceptable. Power circuits extending outside the control panel shall be #12. Conductors shall not be spliced and shall be continuous from terminal to terminal.
- I. Signal wiring shall be segregated from control power wiring, grouped functionally and arranged neatly to facilitate circuit tracing. No combination of analog, digital input or control output wiring shall be intermixed within the same bundle or duct within a panel. DC signal wires shall be segregated from AC signal wires.
- J. Plastic wiring wraps shall be used to bundle wires, except within wiring ducts. The bundles shall be securely fastened to the steel structure at suitable intervals, not exceeding 12".
- K. Where lugs are required, provide locking fork [ring lugs on equipment grounds] with insulating sleeves. Lugs shall be sized according to wire size, and crimped with a ratchet type crimper.
- L. Where shielding is required, shields shall be continuous foil or metalized plastic providing 100% coverage. A drain wire in continuous contact with the shield shall be included.
- M. Conductors shall be stranded copper with 600 volt Type MTW insulation. Wiring from sub-panel to a hinged door or panel shall include a loop in bundle to relieve the tension and allow door to open 150° minimum.
- N. Provide 1" x 6" x 1/4" copper ground bus.
- O. Control panel wiring shall be identified at each termination by marking with a number to correspond with the diagrams. Wire identification shall be one piece wrap on or sleeve type with machine lettering and numbers. Conductors shall be color coded as follows:
 - 1. AC Line and Load Circuits: Black

2. AC Control Circuits: Red
3. DC Control Circuits: Blue
4. Interlock Control Circuits on the Panel Energized from External Source: Yellow
5. Equipment Grounding Conductors: Green
6. Current Carrying Grounded Conductor (neutral): White
7. Intrinsically Safe Circuits: Light Blue

2.05 FINISHES: **(CONTRACTOR AND OSI)**

- A. Provide baked enamel finishes on exposed surfaces.
- B. Provide galvanized finishes for damp or wet locations.
- C. Touch up or refinish damaged paint.

2.06 ACCESSORIES FOR CONTROL PANEL: **(CONTRACTOR AND OSI)**

- A. Nameplates: Minimum 1 inch x 3 inch white plastic with engraved black lettering.
- B. Pilot and Alarm Lights: 120 volt transformer type, push to test, 60 Hertz, with plastic lens and color matched rings; furnish special tools for lamp replacement, if required.
- C. Selector Switches and Push Buttons: Rated oil-tight not less than 120 volt, 10 ampere, 60 Hertz with maintained or momentary contacts as required. Provide legend plates "HAND-OFF-AUTO" or as shown on drawings.

2.07 LOW VOLTAGE, LIGHTING AND POWER CONDUCTORS: **(CONTRACTOR AND OSI)**

- A. Identify each end of each conductor by wire marking tape or sleeve. This includes splice points at all junction boxes. Mark on outer cover giving loop number and/or discrete wire number.
- B. Conductors provided on 120/240 and 480 volt power and control systems to be stranded per ASTM B-8 soft drawn copper.
- C. Insulation system shall be type THHN for field and MTW for panel, rated 600V as defined and listed in Article 310 of NEC.
- D. Minimum size conductor utilized shall be #14 AWG for control circuits and #12 for power and lighting circuits.

2.08 PLC Manufacturer: **(OSI)**

- A. OSI shall provide the required Allen Bradley I/O to accommodate the new I/O listed in this specification and shown on the drawings.

2.09 RADAR LEVEL TRANSMITTER: **(CONTRACTOR)**

- A. Provide Endress and Hauser Radar Level Transmitter model FMR20. Provide suspension cord with sufficient length to reach the control junction box at the control building without splicing. Approved Equal by Vega acceptable.
- B. Calibrate 0-20 feet range.

- C. Provide 2' long mounting bracket to attach to top of concrete wall as shown on drawings.
- D. Tag LT-0, LT-1, LT-2, LT-3,

2.10 PLASTIC WIREWAY: (**CONTRACTOR AND OSI**)

- A. Provide 2" x 3" or 1" x 3" slotted plastic wire way, as required for internal RTU and MTU wireway. Provide Panduit or equal.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install controls in accordance with Drawings, approved shop drawings, and manufacturer's recommendations.

3.02 START-UP AND TRAINING:

- A. Provide service technicians for 2 eight hour days (not including any system programming, debugging, or travel time) to check out the system installation at system start-up. During this time the owners systems integrator and electrical contractor will be asked to assist in fine tuning all controls for optimum operation. This will include but not be limited to making programming changes and time delay adjustments on variable frequency drives, PLC's, HMI's and SCADA Screens.
- B. Provide a service technician for an additional eight (4) hours total to train the facility personnel in the operation, adjustment, and maintenance of control system.

3.03 CLEANING:

- A. Prior to acceptance of the work of this Section, thoroughly clean all related areas in accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION

SECTION 31 20 00

EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes earthwork for foundations, floor slabs, miscellaneous exterior concrete, concrete and asphalt pavements, yard piping and rough site grading.

1.02 REFERENCES:

- A. MDOT - Michigan Department of Transportation, "*2020 Standard Specifications for Construction*".
- B. ASTM - American Society of Testing Materials, latest edition.

1.03 DEFINITIONS:

- A. Maximum Density: Maximum unit weight per volume for an established material.
- B. Optimum Moisture: Percentage of water at maximum density.
- C. Borrow: Material required for earthwork construction in excess of the quantity of suitable material available from required excavation grading or cutting. Borrow may be necessary even though not shown on the plans.
- D. Suitable Excavated Material: Mineral (inorganic) soil free of cinders, refuse, sod boulders, rocks, pavement soft or plastic clays, vegetable or other organic material capable of being compacted as specified. Moisture content has bearing on the suitability of materials to be used.
- E. Granular Material: Coarse grained materials having no cohesion, which derive their resistance to displacement from internal stability.
- F. Cohesive Material: Fine grained material which produces resistance to displacement by mutual attraction between particles. Clays are cohesive.
- G. Rough Grade: Earth grade before placing structure or landscaping.
- H. Subgrade: Earth grade upon which a pavement structure is to be placed.
- I. Rock Excavation: Boulders or rock weighing 4,000 pounds (approximately one cubic yard) or more and all solid or ledge rock, slate, shale, sandstone and other hard materials that require continuous use of pneumatic tools, heavy rippers or continuous drilling and blasting for removal. Pavements are not included.
- J. Proof Rolling: Applying test loads over the rough grade or subgrade surface by means of a heavy pneumatic tire roller or other approved means, to locate and permit timely correction of deficiencies likely to adversely affect performance of the pavement structure.

1.04 JOB CONDITIONS:

- A. If, during progress of the work, testing indicates that materials do not meet specified requirements, remove defective work and replace at no cost.
- B. Protect and preserve all public and private property including existing vegetation, landscape features, monuments within, along and adjacent to the work area.
- C. Moisture content has bearing on the suitability of material to be used.
 - 1. The moisture content of a material may be such that its use will require extensive manipulation to achieve required compaction.
 - 2. It is the Contractor's responsibility to determine the economics of using or disposing and replacing of such materials.
 - 3. Materials determined by the Contractor to be uneconomical for use may be disposed on-site in areas approved by the Engineer and shall be replaced with other material at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Fill:
 - 1. Granular Material shall be MDOT 902.07, Table 902-3, Class III limited to 1.0-inch maximum size.
 - 2. Select Granular Material shall be MDOT 902.07, Table 902-3, Class II or IIA limited to 1.0-inch maximum size.
 - 3. Suitable Excavated Material: ARTICLE 1.03 DEFINITIONS.
- B. Topsoil: Surface soils containing organic matters and productive of plant life.
- C. Pipe Bedding: Compact granular material.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Clearing and Grubbing: MDOT Sections 201 and 202.
 - 1. Remove trees and shrubs as required, unless otherwise indicated.
 - 2. Grub out all stumps and roots:
 - a. To a minimum depth of 4 feet below finished grade within roadways.
 - b. To a minimum depth of 2 feet below finished grade in other locations.
 - 3. Remove all debris from site resulting from clearing and grubbing.
- B. Remove topsoil from all areas of new construction and stockpile on site in designated areas.
- C. Utilities:
 - 1. Before starting excavation, establish location and extent of underground utilities in work area.
 - 2. Notify utility companies to remove and relocate lines which are in conflict with the proposed utility.
- D. Protect Plantings and other features to remain as part of final landscaping.

3.02 EXCAVATION:

- A. Excavate as required for construction of the work. Utilize or dispose of excavated materials as required.
 - 1. Protect excavation by shoring, bracing, sheet piling or other methods as required.
 - 2. Remove unsuitable material to firm underlying soils beneath footings, pipelines, floor slabs, paved areas and walks.
- B. Preparation of Subgrade:
 - 1. Compact top 12 inches of subgrade under footings, slabs, pavement structure areas and walks to ninety-five percent (95%) maximum density unless otherwise specified.
 - 2. Compact top 12 inches under landscaped areas to eighty-five percent (85%) maximum density.
- C. Utilities:
 - 1. Maintain, reroute or extend existing utility lines to remain in excavation area, as required.
 - 2. Protect utility services uncovered by excavation.
 - 3. Cap off, plug or seal discontinued utility services and remove from site within excavated areas.

3.03 FILL:

- A. Under Floor Slabs and Exterior Slabs: Place select granular material in layers maximum 9 inches deep compacted to ninety-five percent (95%) maximum density.
- B. Landscape Areas: Place suitable excavated material or granular material in layers maximum 12 inches deep compacted to eighty-five percent (85%) maximum density.

3.04 ROUGH GRADING:

- A. Rough grade to levels, profiles, contours and elevations required for finished grades and surface treatment.
- B. Maintain the following rough grades:
 - 1. Sidewalk: 4 inches below finished grade.
 - 2. Floor slabs, exterior slabs and sidewalk at driveways: 6 inches below finished grade.
 - 3. Pavement surfaces: As shown on drawings.
 - 4. Landscape areas: 4 inches below finished grade to receive topsoil.

3.05 DEWATERING:

- A. Provide dry excavations until structures have been placed and fill is complete.
- B. Provide and maintain slopes, crowns, ditches and ponds to ensure satisfactory surface drainage at all times.
 - 1. Construct ditches and other drainage facilities necessary to remove ponded water as soon as practical to provide dry work areas for progression of the work.
 - 2. Interruption of surface drainage or underdrainage: Provide temporary drainage facilities until permanent drainage work complete.

3.06 COMPACTION:

- A. Place and compact all required materials and provide proper control of moisture content of the material and other details necessary to obtain satisfactory results.
 - 1. Remove materials that cannot be compacted with manipulation and moisture control.
 - 2. Replace with suitable excavated material or granular material at no additional cost.
- B. Correct any deficiencies resulting from insufficient or improper compaction. Retest if required.
- C. Provide equipment and personnel for access to test locations.
- D. Moisture - Density Relationship:
 - 1. Cohesive (Clays) or Granular (Sands) Soils: ASTM D1557 (Modified Proctor).
 - 2. Granular (Sands) Soils: Michigan Cone Test.
- E. Testing will be by ENGINEER or OWNER approved independent laboratory.

3.07 SURPLUS MATERIALS:

- A. Surplus excavated or unsuitable excavated material shall become the property of the Contractor.
- B. Dispose of surplus or unsuitable materials off-site.

END OF SECTION

SECTION 31 23 33

TRENCHING, EXCAVATING, BACKFILLING AND COMPACTING

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes the work required for trenching, excavating and backfilling, special pipe foundations and special work below grade.

1.02 DEFINITIONS:

- A. Maximum Density: Maximum dry weight in pounds per cubic foot of a specific material.
- B. Optimum Moisture: Percentage of water at maximum density.
- C. Rock Excavation: Includes all boulders or rock weighing 4,000 pounds (approximately one cubic yard) or more and all solid or ledge rock, slate, shale, sandstone and other hard materials that require continuous use of pneumatic tools, heavy rippers or continuous drilling and blasting for removal. Pavements are not included.
- D. Suitable Excavated Material: Mineral (inorganic) soil free of cinders, refuse, sod, boulders, rocks, pavement, soft or plastic clays, vegetable or other organic material, and capable of being compacted as specified. Moisture content has bearing on the suitability of materials to be used.
- E. Granular Material: Coarse grained materials having no cohesion, which derives its resistance to displacement from internal stability.
- F. Cohesive Material: Fine grained material which derives its resistance to displacement by manual attraction between particles of the mass, involving forces of molecular origin (i.e. Clays are considered cohesive).
- G. Grade Terminology: In accordance with the detail.

1.03 REFERENCES:

- A. MDOT - Michigan Department of Transportation, *"2020 Standard Specifications for Construction"*.
- B. ASTM - American Society of Testing Materials, latest edition.

1.04 JOB CONDITIONS:

- A. Obtain and comply with construction permits from agencies having jurisdiction over the work.
- B. Scheduling: Clean up promptly following utility installation backfilling.
- C. Dust Control: Broom or apply dust palliatives as needed.

- D. Driveway Closing: Eight (8) hour maximum with prior notification to resident. Maintain emergency access to all properties during construction.
- E. Signs, mailboxes and other movable surface features:
 - 1. Witness location prior to removal. Relocate to accessible location and maintain during construction.
 - 2. Upon completion of construction, replace to original position and condition.
 - 3. Replace regulatory traffic control signs immediately after utilities are placed and backfilled.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Trench Backfill:
 - 1. Trench backfill shall not contain frozen soil.
 - 2. Granular Material shall be MDOT 902.07, Table 902-3, Class III limited to 1.0-inch maximum size.
 - 3. Select Granular Material shall be MDOT 902.07, Table 902-3, Class II or IIA limited to 1.0-inch maximum size.
 - 4. Concrete Grade 3000 per MDOT Section 1004.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Clearing and Grubbing:
 - 1. Save and protect all trees and vegetation not identified to be removed.
 - 2. Repair or replace trees, shrubs and other vegetation damaged by CONTRACTOR's operation at no additional charge.
- B. Conflicting Underground Facilities:
 - 1. Before starting work, establish location and extent of existing underground facilities in work area.
 - 2. Establish potential conflict areas prior to construction.
 - 3. Excavate and expose existing underground facilities presenting potential conflict to determine their exact location and elevation.
 - 4. Advise Engineer of conflicts and obtain instructions on how to proceed.
 - 5. Make adjustments in proposed utility location at no additional cost.
 - 6. Make arrangements with owner of existing underground facilities for relocation, if necessary.
 - 7. Schedule work accordingly.

3.02 EXCAVATION:

- A. General:
 - 1. Dispose of surplus and unsuitable excavated material.
 - 2. Remove, salvage and stockpile topsoil.
 - 3. Unsuitable material encountered in subgrade or below payment line: obtain instruction on how to proceed.
- B. Trenches:
 - 1. Depth: Provide a uniform and continuous bearing and support for proposed utility on solid and undisturbed or compact granular material.

2. Minimum Width: Allow space for jointing and bedding. Meet requirements of AWWA C600 or C605, as applicable, for water main.
 3. Maximum Width: The following limitations shall apply at utility crown:
 - a. 6 inch through 10-inch diameter: 30 inches.
 - b. 12 inch through 30-inch diameter: Outside diameter plus 24 inches.
 - c. 30 inch and over diameter: Outside diameter plus 36 inches.
 - d. Elliptical: Outside pipe width plus 36 inches.
- C. Blasting:
1. Not allowed unless otherwise indicated.
 2. If allowed, obtain and comply with required permits.
 3. If allowed, perform only during hours approved by Owner.
- D. Length of Open Trench shall be 200 feet maximum.
- E. Damage to Existing Underground Utilities:
1. Report all damage to Engineer and utility owner.
 2. Repair to utility owner's standard.

3.03 BACKFILLING:

- A. Pipe bedding area: Compact granular material to ninety percent (90%) of maximum density according to the Modified Proctor Method or to ninety-five percent (95%) of maximum density using the Michigan Cone Test.
- B. Trench Backfill Area:
1. Under permanent pavement, shoulder areas and areas within a one on one slope from the shoulder edge:
 - a. Compact suitable excavated material or granular material in 9.0-inch layers to ninety percent (90%) of maximum density according to the Modified Proctor Method or to ninety-five percent (95%) of maximum density using the Michigan Cone Test.
 2. Under nonpermanent pavement: Same as permanent pavement.
 3. Under unimproved right-of-way areas: Compact suitable excavated material to eighty-five percent (85%) of maximum density.
 4. Under landscaped and unimproved areas: Compact suitable excavated material to eighty percent (80%) of maximum density.
 5. Under undercut existing structure: Place concrete.
- C. Structures:
1. Density requirements: Same as Trenches.
 2. Concrete structure: Place backfill only after seventy-five percent (75%) of concrete design strength has been reached.

3.04 TRENCH UNDERCUTTING AND BACKFILL:

- A. Excavation: Perform to Owner or Owner's Representative instructions.
- B. Backfill: Provide with granular material compacted in place.

3.05 COMPACTION, TESTING AND INSPECTION:

- A. Surplus excavated and unsuitable excavated material shall become the property of the Contractor.

- B. Dispose of surplus excavated or unsuitable excavated materials off-site.
 - C. Performance and test equipment will be provided by Owner or Owner's Representative approved independent laboratory.
 - D. Moisture - Density relationships:
 - 1. Cohesive (clays) soils: ASTM D 1557 (Modified Proctor).
 - 2. Granular (sands) soils: Michigan Cone Test.
 - E. Field Density: ASTM D-2922 (Nuclear).
 - F. Furnish equipment and personnel to provide access to test location and depth. Density tests will be performed at various levels, during or after backfilling operation.
 - G. Correct any deficiencies resulting from insufficient or improper compaction. Retesting of density in areas of failed tests shall be performed by Owner or Owner's Representative at the Contractor's expense.
- 3.06 SOIL EROSION AND SEDIMENTATION CONTROL:
- A. See SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENTATION CONTROL.

END OF SECTION

SECTION 32 92 00

SURFACE PROTECTION, RESTORATION AND TURF ESTABLISHMENT

PART 1 - GENERAL

1.01 SUMMARY:

- A. Work included in this specification consists of the establishment of a durable, permanent, weed free, mature, perennial turf and protection and restoration of site improvements.
- B. Definition of Site Improvements: Fences, mailboxes, street signs, sheds, playground equipment, landscaping stones and decorations, underground lawn irrigation systems, retaining walls, parking appurtenances, and yard accessories.

1.02 REFERENCES:

- A. MDOT - Michigan Department of Transportation, *"2020 Standard Specifications for Construction"*.
- B. MDOT – Michigan Department of Transportation, "Materials Source Guide" current edition.
- C. ASTM – American Society of Testing Materials, latest edition.

1.03 SUBMITTALS:

- A. Pre-Construction:
 - 1. Topsoil test results.
 - 2. Property owner notification letter.
 - 3. Seed mixture.
 - 4. Fertilizer product.
 - 5. Herbicide product and application method
- B. Post Construction:
 - 1. Contractor's Daily Reports

1.04 JOB REQUIREMENTS:

- A. Surface Areas Disturbed by Construction Operation:
 - 1. Restoration and Turf Establishment:
 - a. Fine grade to 4 inches below finished grade.
 - b. Remove all stones and debris greater than 1-inch diameter.
 - c. Place 4 inches of topsoil.
 - d. Rake smooth to finished grade, seed, fertilize and mulch, or place mulch blanket pegged in place, where specified or required for slope stability.
 - 2. Place sod in areas indicated on the Drawings.
- B. Site Improvements:
 - 1. Protect all items not indicated for removal.
 - 2. Where Site Improvements impact proposed construction, remove the item carefully, store and protect the item and reinstall the item upon completion of construction.
- C. Scheduling:

1. Restoration of lawns and other surface features:
 - a. As soon as possible after final grading of the areas designated for turf establishment but no later than the maximum time frames stated in MDOT 208.03 or as required by project soil erosion control permit.
 2. Clean up: Promptly following restoration.
- D. Seasonal Limitations:
1. MDOT 816.03.C.4.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Topsoil:
1. Topsoil may be salvaged and reinstalled from the project site or imported to the site:
 - a. Salvaged topsoil:
 - 1) Must be segregated during construction and kept free of intermingling with other soils.
 - 2) The acceptance of salvaged topsoil is subject to its ability to establish turf. The salvaged topsoil must be acceptable to the Owner and property owner after turf is established. The existing topsoil may or may not be acceptable in its existing condition.
 2. Material:
 - a. Salvaged and imported topsoil:
 - 1) Shall be screened and amended either on-site or off-site.
 - 2) Shall be loose, friable, and free of refuse and foreign material.
 - 3) 20% minimum organic material by test method ASTM D2974.
 - 4) pH of 6.8 to 7.5 by test method ASTM D4972.
 - 5) Gradation:
 - a) 100% passing the ½" sieve.
 - b) 98% minimum passing the ¼" sieve.
 - c) 30% maximum passing the #200 sieve.
- B. Grass Seed Mixture:
1. All species and their cultivars or varieties must be guaranteed hardy for Michigan.
 2. The species selected must be disease and insect resistant and of good color.
 3. Grass seed mix shall contain no more than 5% inert material by weight.
 4. The species of seed selected must be adapted for the site conditions and locations including but not limited to manicured yards.
 5. Grass Seed Mix shall be comprised of at least four of the below species and each species selected shall be 5% to 25% of the grass seed mixture by weight. At least two species selected shall be salt tolerant.
 - a. Kentucky Bluegrass.
 - b. Perennial Ryegrass.
 - c. Hard Fescue.
 - d. Creeping Red Fescue.
 - e. Chewings Fescue.
 - f. Turf-type Tall Fescue.
 - g. Buffalo grass.
 - h. Alkaligrass-Fults Puccinellia distans.
- C. Chemical Fertilizer: MDOT 917.09, Class A.
1. Phosphorus can only be used at the time of planting or when soil conditions require.

- D. Hydro-mulch: MDOT 917, Recycled newsprint or wood fiber.
- E. Co-polymer Gel: Finn Hydro Gel B, or equal.
- F. Herbicide:
 - 1. Herbicides shall be furnished and applied as required to control weed growth. The Contractor shall select the herbicide and rate of application in accordance with the manufacturer's recommendations. The Contractor shall comply with all federal, state and local laws as noted in MDOT Section 107.
- G. Water:
 - 1. Water shall be furnished and applied from an approved source. Do not draw water from any waterway (i.e. river, ditch, creek, lake, etc.)
- H. Sod:
 - 1. MDOT 917.12.
- I. Mulch Blanket:
 - 1. MDOT 917.14, Excelsior or straw mulch blanket listed on the current Qualified Products List in the MDOT Materials Source Guide.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Prior to construction, provide advance notice to property owners of privately-owned surface features within the project area to allow the property owner time to remove or relocate them.
- B. Prior to placing topsoil, shape, compact and assure all areas to be seeded are debris and weed free. Place topsoil to a minimum depth of 4 inches and to meet proposed finished grade. If the area being restored requires more than the minimum depth of topsoil to meet finished grade, this additional depth shall be filled using topsoil. Furnishing and placing this additional material will not be paid separately.

3.02 TREES AND SHRUBS:

- A. Protect all trees and shrubs during construction.
- B. Where existing trees and shrubs will be impacted by construction, Contractor shall prune or trim branches in accordance with industry standard horticulture practice.
- C. Tree limbs inadvertently damaged during construction shall be trimmed to remove the damaged portion within 5 days. Contractor shall notify the property owner and Owner or Owner's representative of the inadvertent damage caused and the remedy.

3.03 IRRIGATION SYSTEMS:

- A. Contractor shall make every effort to protect existing irrigation systems adjacent to the project area.
- B. Irrigation repair is the responsibility of the Contractor. Where existing irrigation systems are encountered during construction the Contractor shall temporarily relocate or remove as required to place the proposed improvements and repair the irrigation system promptly

following construction of the improvements. This work may require cutting and capping of the existing sprinkler lines and salvaging of the existing sprinkler heads for reuse during replacement. Where lines are cut Contractor shall take measures to prevent dirt or debris from entering the existing sprinkler lines or heads. Damaged irrigation heads shall be replaced in-kind. Acceptance of the repair subject to the approval of the property owner.

3.04 TOPSOIL:

- A. Place 4 inches of topsoil in preparation of seeding.
- B. Construction methods:
 - 1. MDOT 816.03.A.

3.05 RESTORATION NOTIFICATION TO THE PROPERTY OWNERS:

- A. The Contractor shall distribute a letter to all residents at the time of seeding that states, at minimum, the following: Topsoil, grass seed, and fertilizer were placed on XX date, the minimum watering requirements that the contractor will be doing and the time frame, and it will be the responsibility of the home owner to water and maintain the grass after that time period. A copy of the letter shall be provided to the Owner and Owner's representative prior to the time that it is distributed to the residents.

3.06 HYDROSEEDING, FERTILIZING AND MULCHING:

- A. Construction methods: Hydro-seed with mixture of seed, fertilizer, and mulch, and co-polymer gel with the following minimum rates:
 - 1. Seed:
 - a. 220 pounds per acre.
 - 2. Fertilizer:
 - a. 228 pounds per acre.
 - 3. Mulch:
 - a. 1,200 pounds per acre of recycled newsprint or 2,000 pounds per acre of wood fiber.
 - 4. Co-polymer gel:
 - a. 10 pounds per acre between June 1 and September 1.
 - b. Zero at other times of the year.

3.07 SODDING:

- A. Construction Methods:
 - 1. MDOT 816.

3.08 MULCH BLANKET:

- A. Construction Methods:
 - 1. MDOT 816.

3.09 MAINTENANCE

- A. Repair:
 - 1. The Contractor is responsible, at no additional cost, for the repair of turf establishment work occasioned by storm events up to 3 inches of rain in a 24-hour period as documented by local meteorological data.

2. Repairs made to damaged turf establishment areas as a result of a documented storm by a local meteorological data resulting in rainfall amounts of more than 3 inches in a 24 hr period will be paid for as an increase to the turf restoration quantity.

B. Inspections:

1. The Contractor is responsible for all inspection of turf establishment work. Provide notification to Owner or Owner's representative of upcoming inspections or maintenance work.
2. Provide a Contractor's Daily Report to report inspections made and to document turf establishment work performed on this project.
3. Complete and submit a Contractor's Daily Report when any work performed is in progress.
4. Include all necessary materials documentation including tests slips, certifications, etc. with the associated Contractor's Daily Report.

3.10 ACCEPTANCE

A. Final Acceptance:

1. Before final acceptance of the turf establishment work there must be no exposed bare soil and the turf must be fully germinated, erosion free, weed free, disease free, dark green in color and in a vigorous growing condition.
2. Once growth of weed-free grass has been achieved the Contractor's responsibility in this matter shall have ended. However, it is to be clearly understood that any failure on the part of the property owner to properly care for the restored lawn area prior to achieving a good growth of weed-free grass shall in no way relieve the Contractor of his responsibility as set forth above.

3.11 SITE IMPROVEMENTS:

- A. Site Improvements damaged by contractor shall be replaced by Contractor at Contractor's cost.
- B. Unique and one-of-a-kind items damaged during construction shall be repaired, replaced or otherwise resolved by the Contractor to its owner's satisfaction.

END OF SECTION

SECTION 33 21 14

In-Line Dynamic Mixer

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Work includes, but is not necessarily limited to, the furnishing and installation of an in-line dynamic mixer and associated piping and accessories as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. AWWA – American Water Works Association standards:
 - 2. ASTM Standard Specifications:
 - a. A 53 – Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - b. A 108 – Steel Bars, Carbon, Cold-finished, Standard Quality.
 - c. A 120 – Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses.
 - d. A 276 – Stainless and Heat-Resisting Steel Bars and Shapes.
 - e. B 505 – Copper-Base Alloy Continuous Castings.
 - f. B 584 – Copper Alloy Sand Castings for General Applications.
 - 3. National Electric Code (NEC).
 - 4. National Fire Protection Association (NFPA).

1.03 DESIGN AND PERFORMANCE REQUIREMENTS:

- A. Design:
 - 1. Liquid: Surface Water
 - 2. Design Flowrate: 1700 gpm.
 - 3. G-Value:
 - a. Minimum: 750 s⁻¹
 - b. Maximum: 14,000 s⁻¹
- B. Performance:
 - 1. Motor:
 - a. Maximum Speed: 1800 rpm.
 - b. 5 brake horsepower maximum.

1.04 SUBMITTALS:

- A. Pre-Construction:
 - 1. Mixer & Motor:
 - a. Manufacturers, models, and rotative speed.
 - b. Motor horsepower, efficiency, full load and start up amp draw.
 - c. Dimensional drawings of unit.
 - 2. Shop Drawings of the proposed mixing equipment.

3. Operation and maintenance manuals:
 - a. Equipment function, normal operating characteristics and limiting conditions.
 - b. Assembly, installation, alignment, adjustment and checking instructions.
 - c. Operating instructions for start-up, routine and normal operating, regulation and control, and shutdown and emergency conditions.
 - d. Lubrication and maintenance instructions.
 - e. Guide to "troubleshooting".
 - f. Parts lists and predicted life of parts subject to wear.
 - g. Outline, cross-sections, assembly drawings, data and wiring diagrams.

1.05 QUALITY ASSURANCE:

- A. Qualifications:
 1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the approved Shop Drawings.
- B. Manufacturer's certification:
 1. Submit Manufacturer's sworn statement that the equipment furnished complies with this Specification.
 2. Provide Manufacturer's field service.
- C. Regulatory requirements.
 1. Occupational Safety and Health Act of 1970: All equipment installations shall comply with Act and regulations.

1.06 WARRANTY:

- A. The System Manufacturer shall guarantee the equipment against defects in materials and workmanship under normal use and service, to the original purchaser, for a period of twelve (12) months from date of equipment startup by an authorized technician.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Dynamix
- B. UET
- C. Or Engineer Approved Equal

2.02 MIXER EQUIPMENT:

- A. General:
 1. Provide: mixer with flanged housing, motors, supports, stainless steel anchor bolts, anchor bolt assemblies and replacement of components and ancillary equipment as necessary to complete the specified modifications and to attain design and performance requirements.
 2. Dynamic Mixer: In-line type.
 3. All materials which may come in contact with water intended for use in the public water supply shall be certified to meet ANSI/NSF Standard 14, 61, 372, and 600 as applicable.

- B. Mixer components:
 1. 12" flanged, in-line mixer
 2. Flanges to be ANSI 150# RFSSO
 3. Includes internal baffles
 4. (2) 4-blade axial impellers
 5. Includes a drain plug
 6. Material of Wetted Parts: 316 Stainless Steel

- C. Motor (AWWA E101, A4.1.2): Provide new motors for all pumps. New motors shall meet the following:
 1. The mixer shall be power by an AC motor sized to handle the maximum torque and horsepower.
 2. Motor shall have a NEMA 184TC frame, 5HP, 1800 rpm / 4-poles, 230VAC, 60 Hz, 3 phase, with a TEFC enclosure.
 3. Motor shall be premium efficiency, rated for severe duty.
 4. Motor shall have Class F, with a service factor of at least 1.25.

- D. Shaft
 1. The mixer shaft shall be connected to the motor output shaft by means of a coupling.
 2. A protective wear sleeve shall be added between the shaft and sealing packing.
 3. Shaft material to be 316 stainless steel.

- E. Sealing
 1. Mixer sealing shall consist of square GFO expanded PTFE-Graphite packing, with Teflon throttle bushing and lantern rings.

- F. Mixing Impellers
 1. The mixer shall include (2) impellers. Impellers shall be 4-blade, 45-degree axial type.
 2. Impellers shall be welded to the shaft.

- G. Protective Coating
 1. Normally painted parts not subject to continuous wetting by the process liquid include electric motors, speed reducers, pedestals, mounting bases, etc. These painted surfaces shall receive a protective coating per the mixer manufacturer's specifications.
 2. Surfaces normally left uncoated, such as the coupling and material that contacts the process fluid, will not require special coatings.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install all pumping components in conformance with:
 1. Accepted Shop drawings.
 2. Manufacturer's recommendations.
 3. Michigan Department of Energy, Great Lakes, and Environment (EGLE): "Suggested Practice for Waterworks Design, Construction and Operation".

- B. The equipment specified herein shall be located as shown or described and installed in accordance with the manufacturer's recommendations.

- C. Each mixer, including motor, shall be factory assembled, aligned, and securely crated for shipment.

3.02 FIELD QUALITY CONTROL AND DEMONSTRATION:

- A. Provide one day of services of a representative of the Manufacturer to inspect the mixer equipment and accessories after the mixer has been installed and to test and certify installation and instruct Owner's personnel in the proper operation and maintenance.
- B. Schedules:
 - 1. Installation, start-up trip, and training:
 - a. Minimum of 8 hours.
 - b. Dedicated for installation and start-up check out.
 - c. Perform any other tests recommended by Manufacturer.
 - d. Submit written report of installation verification and acceptance to Owner or Owner's representative.
 - e. Submit written notice to Contractor and Owner or Owner's representative of all deficiencies, changes, or additions.
 - f. Trip schedule approved by Contractor and Owner or Owner's representative.

3.03 CLEANING:

- A. Prior to acceptance of the work of this Section, thoroughly clean all installed materials, equipment and related areas.

END OF SECTION

SECTION 33 21 14

VERTICAL TURBINE WELL PUMP AND ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Work includes, but is not necessarily limited to, the furnishing and installation of a vertical turbine pump and associated piping and accessories as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. AWWA – American Water Works Association standards:
 - a. A 100 – Water Wells.
 - b. E 101 – Vertical Turbine Pumps – Line Shaft and Submersible Type.
 - 2. ASTM Standard Specifications:
 - a. A 53 – Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - b. A 108 – Steel Bars, Carbon, Cold-finished, Standard Quality.
 - c. A 120 – Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses.
 - d. A 276 – Stainless and Heat-Resisting Steel Bars and Shapes.
 - e. B 505 – Copper-Base Alloy Continuous Castings.
 - f. B 584 – Copper Alloy Sand Castings for General Applications.
 - 3. National Electric Code (NEC).
 - 4. National Fire Protection Association (NFPA).
 - 5. National Sanitation Foundation (NSF)

1.03 DESIGN AND PERFORMANCE REQUIREMENTS:

- A. Design:
 - 1. Pumped material: Surface Water.
 - 2. Design Flowrate:
 - a. Running near full speed: 1700 gpm.
 - b. Running at reduced speed: 970 gpm.
 - 3. Total dynamic head:
 - a. 26.2 ft. TDH @ 1700 gpm.
 - b. 20 ft. TDH @ 970 gpm.
 - 4. Static Lift Required: 18 ft.
- B. Performance:
 - 1. Pump curve:
 - a. 1700 gpm at 26.2 feet TDH (Design Point).
 - b. Maximum number of stages: 2.
 - c. Pump shall operate within the normal operating range specified without cavitation or excessive vibration.
 - 2. Pump/motor:
 - a. Speed: 1200 rpm
 - b. 20 brake horsepower maximum.

- c. Minimum pump efficiency at design point: 80 %.
- d. NPSH required: Less than 10 feet at design point.

1.04 SUBMITTALS:

A. Pre-Construction:

1. Pump & Motor:
 - a. Manufacturers, models, rotative speed and number of bowls
 - b. Complete performance curves for each bowl and all bowls combined.
 - 1) Resulting from a certified, non-witnessed test using a calibrated motor.
 - 2) Showing capacity, head, NPSH required, efficiency, brake horsepower, impeller diameter and shutoff head
 - c. Motor horsepower, efficiency, full load and start up amp draw.
 - d. Dimensional drawings of unit.
2. Riser Pipe, Line Shaft and Accessories:
 - a. Riser pipe material, diameter and joint construction.
 - b. Line shaft material, size, bearing details and connection details.
 - c. Screen material, opening size and dimensional drawings
 - d. Check valve manufacturer, size and number and location of check valves in the riser pipe.
3. Operation and maintenance manuals:
 - a. Equipment function, normal operating characteristics and limiting conditions.
 - b. Assembly, installation, alignment, adjustment and checking instructions.
 - c. Operating instructions for start-up, routine and normal operating, regulation and control, and shutdown and emergency conditions.
 - d. Lubrication and maintenance instructions.
 - e. Guide to "troubleshooting".
 - f. Parts lists and predicted life of parts subject to wear.
 - g. Outline, cross-sections, assembly drawings, data and wiring diagrams.

1.05 QUALITY ASSURANCE:

A. Qualifications:

1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the approved Shop Drawings.

B. Manufacturer's certification (AWWA E101, A3.3):

1. Submit Manufacturer's sworn statement that the equipment furnished complies with this Specification.
2. Provide Manufacturer's field service.

C. Regulatory requirements.

1. Occupational Safety and Health Act of 1970: All equipment installations shall comply with Act and regulations.

1.06 WARRANTY:

- A. Warranty provided shall not be void with the use of a variable frequency drive (VFD).
- B. The System Manufacturer shall guarantee the equipment against defects in materials and workmanship under normal use and service, to the original purchaser, for a period of twelve

(12) months from date of equipment startup by an authorized technician, or 18 months from the date of shipment – whichever is less.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. The vertical turbine well pump, accessories, and ancillary equipment shall be the product of Hydroflo, American Marsh, Faribanks Morse, or approved equal.

2.02 PUMPING EQUIPMENT:

- A. General:
 - 1. Provide: pumps, motors, pump bases, pump column assemblies, supports, stainless steel anchor bolts, anchor bolt assemblies and replacement of components and ancillary equipment as necessary to complete the specified modifications and to attain design and performance requirements.
 - 2. Vertical turbine pumps: Open line shaft type.
 - 3. Water lubricated.
 - 4. All materials which may come in contact with water intended for use in the public water supply shall be certified to meet ANSI/NSF Standard 14, 61, 372, and 600 as applicable.
- B. Motor (AWWA E101, A4.1.2): Provide new motors for all pumps. New motors shall meet the following:
 - 1. Vertical hollow-shaft motor.
 - 2. Non-reverse ratchet.
 - 3. Enclosure:
 - a. Totally Enclosed Fan Cooled (TEFC).
 - b. Coordinate base diameter with pump discharge head.
 - 4. Insulation: Class F
 - 5. Motor thrust capability: Exceed pump thrust for full performance curve.
 - 6. Efficiency:
 - a. Premium or high grade.
 - b. Guaranteed minimum of 92% at rated horsepower.
 - 7. Electrical: 240-volt, 3 phase, 60 Hertz, 1200 rpm (max.).
 - 8. Motor shall be approved by manufacturer to be used on the load side of a variable frequency drive. Motor shall be NEMA MG1, Part 31.
 - 9. Minimum Nameplate Motor Sizes:
 - a. 20 HP.
 - 10. NEMA Class B design.
 - 11. Service factor 1.15.
 - 12. NEMA Code G.
 - 13. . Inverter Duty Rated
- C. Pump components:
 - 1. Discharge head:
 - a. Type: Under floor.
 - b. Material: Steel Fabricated Head, A53 GrB
 - c. Discharge flange: 150# FF Discharge Flange
 - 1) 10 Inch
 - d. Motor base drain.
 - e. OSHA approved coupling guard.
 - f. Provide sufficient clearance to allow for sealing maintenance.

2. Head base plate:
 - a. Material: Steel Fabricated, A53 GrB
3. Water-lubricated pump column (AWWA E101, A-4.3):
 - a. Column pipe:
 - 1) Material: Steel Fabricated, A53 GrB
 - 2) Connections: Threaded sleeve type couplings:
 - a) Coupling material: Steel ASTM A 108 Gr1020.
 - 3) Minimum diameter: 10-inch.
 - 4) Minimum Wall Thickness: .365"
 - b. Line shaft:
 - 1) Top shaft: Stainless steel, ASTM A 582, Type 416.
 - 2) Line shaft: Steel, ASTM A 108, Gr1045.
 - 3) Line shaft couplings: Steel, ASTM A 108, Gr114 or Gr1213.
 - 4) Minimum diameter: Manufacturer's recommended diameter or 1-1/2-inch whichever is larger.
 - 5) Shaft section length: 10 feet maximum.
 - c. Line shaft bearing retainers:
 - 1) Material: Stainless Steel, Type 316
 - 2) Type: Removable.
4. Bowl assembly:
 - a. Shaft: Stainless steel, ASTM A 582, Type 416.
 - b. Bowls (AWWA E101, A-4.3):
 - 1) Material: Cast iron ASTM A 48, Class 30.
 - 2) Connections: Flanged.
 - 3) Provide wear rings on pumps with enclosed impellers.
 - c. Bearings:
 - 1) Material: Rubber or bronze ASTM B 584.
 - 2) Above and below each impeller.
 - d. Impellers:
 - 1) Material: Bronze ASTM B 584.
 - 2) Type: Enclosed or semi-enclosed.
 - 3) Lock collet.
 - 4) Collet locknut: Stainless Steel, Type 316
 - 5) Keyed to shaft with split ring for convenient disassembly.
5. Suction pipe:
 - a. Material: Match column pipe.
6. Strainer:
 - a. Material: Type 304 stainless steel
 - b. Size: 1/4-inch openings.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install all pumping components in conformance with:
 1. Accepted Shop drawings.
 2. Manufacturer's recommendations.
 3. Michigan Department of Environment, Great Lakes, and Energy (EGLE): "Suggested Practice for Waterworks Design, Construction and Operation".

3.02 FIELD QUALITY CONTROL AND DEMONSTRATION:

- A. Provide the services of a representative of the Manufacturer to check out the pump equipment and accessories after the pump has been installed and to instruct Owner's personnel in the proper operation and maintenance.
- B. Schedules:
 - 1. Installation, start-up trip, and training:
 - a. Minimum of 8 hours.
 - b. Dedicated for installation and start-up check out.
 - c. Run head versus capacity test at minimum of 5 points including design point. During test record the following:
 - 1) Flow.
 - 2) Discharge pressure.
 - 3) Static water level.
 - 4) Pumping water level.
 - 5) Amp draws.
 - 6) RPM.
 - 7) Vibration.
 - 8) Lubrication.
 - d. Perform any other tests recommended by Manufacturer.
 - e. Submit written report of installation verification and acceptance to Owner or Owner's representative.
 - f. Submit written notice to Contractor and Owner or Owner's representative of all deficiencies, changes, or additions.
 - g. Trip schedule approved by Contractor and Owner or Owner's representative.

3.03 DISINFECTION AND BACTERIOLOGICAL TESTING:

- A. Chlorination:
 - 1. Disinfect well in accordance with ANSI/AWWA C654-97.
 - 2. Observation: By Owner or Owner's representative.
 - 3. Sequence: Following equipment installation and prior to connection to the water system.
- B. Bacteriological Testing:
 - 1. Two consecutive safe bacteriological samples shall be taken 24 hours apart before placing the well into service.
 - 2. One sample shall be collected at each well.
 - 3. Sampling: By Owner, with a minimum 24 hours notice from Contractor.
 - 4. Correction: Rechlorinate the well and piping.
 - a. Retesting costs shall be paid for by Contractor.

3.04 CLEANING:

- A. Prior to acceptance of the work of this Section, thoroughly clean all installed materials, equipment and related areas.

END OF SECTION

SECTION 40 05 13

PROCESS PIPING

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and installation of process piping and appurtenances as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 40 05 23 – Process Valves.
 - c. Section 09 96 00 – High-Performance Coatings.
- C. Work included:
 - 1. The work covered under this section includes nonburied piping, exterior or interior, and buried piping which is less than a distance of 3 feet from a structure penetration, as indicated on the Drawings and herein specified.
- D. Work not included:
 - 1. The work not covered under this Section includes buried piping, which is greater than a distance of 3 feet from a structure penetration. The work does not include domestic cold and hot water systems, building waste, vent, and drainage systems, and piping systems to support HVAC systems.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the Work of this Section shall comply with the following:
 - 1. ASTM Standard Specification:
 - a. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - b. A307 - Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
 - c. A403 - Wrought Austenitic Stainless Steel Piping Fittings.
 - d. A563 - Carbon and Alloy Steel Nuts.
 - e. A774 - As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures.
 - f. A778 - Welded, Unannealed Austenitic Stainless Steel Tubular Products.
 - g. D1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - h. D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - i. D2464 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
 - j. D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 - k. D2467 - Socket Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
 - l. D2564 - Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
 - m. F437 - Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.

- n. F438 - Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40.
- o. F439 - Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
- p. F441 - Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
- q. F493 - Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
- r. F656 - Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- 2. AWWA Standards:
 - a. C110 - Ductile-Iron and Gray-Iron Fittings, 3-Inch through 48-Inch, for Water and Other Liquids.
 - b. C115 - Flanged Ductile-Iron Pipe with Threaded Flanges.
 - c. C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
 - d. C207 – Steel Pipe Flanges for Waterworks Service.
 - e. C219 - Bolted, Sleeve-Type Couplings for Plain-End Pipe.
 - f. C606 - Grooved and Shouldered Joints.
- 3. Manufacturers Standardization Society (MSS) Standards:
 - a. SP-58 - Pipe Hangers and Supports – Materials, Design, Manufacture, Selection, Application, and Installation.
 - b. SP-114 - Corrosion Resistant Pipe Fittings Threaded and Socket Welding, Class 150 and 1000.
- 4. ASME Standards:
 - a. B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300.
 - b. B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
 - c. B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

1.03 DEFINITIONS:

- A. Abbreviations:
 - 1. BSP: Black steel pipe.
 - 2. DIP: Ductile iron pipe.
 - 3. GSP: Galvanized steel pipe.
 - 4. SS: Stainless steel.

1.04 SUBMITTALS:

- A. Pre-Construction:
 - 1. Submit in accordance with Section 01 33 00 - Submittals.
 - 2. Shop Drawings:
 - a. Submit for process piping systems.
 - b. Show pipe diameter, wall thickness, length, materials, coatings, connections, centerline elevations, and locations and dimensions of valves and fittings.
 - c. Indicate the location and centerline elevation of all wall sleeves and wall pipes.
 - d. Indicate the type and location of pipe supports on 8-inch pipe and larger.
 - e. Indicate the type and location of pipe couplings.
 - f. Indicate pipe joint gasket material, style, and location.
 - g. Indicate pipe joint bolting materials, sizes, and lengths.
 - 3. Installation instructions:
 - a. Submit complete Manufacturer's installation instructions for all products.
 - b. Submit pipe Manufacturer's recommended span lengths between hangers or supports for each pipe size and type.

4. Submit Manufacturer's certification the Products and materials conform to Specifications.

- B. Post Construction:
 1. Not Used

1.05 QUALITY ASSURANCE:

- A. Qualifications:
 1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the reviewed Shop Drawings.

1.06 DELIVERY, STORAGE AND HANDLING:

- A. Receiving and storage:
 1. All materials shall be delivered in original, unbroken, brand marked containers or wrapping as applicable.
 2. Handle and store materials:
 - a. In a manner which will prevent:
 - 1) Deterioration or damage.
 - 2) Contamination with foreign matter.
 - 3) Damage by weather or elements.
 - b. In accordance with Manufacturer's directions.
- B. Rejected material and replacements:
 1. Reject damaged, deteriorated, or contaminated material and immediately remove from the Site.
 2. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Copper Alloy (Brass & Bronze) documentation for dezincification protection to be submitted in accordance with the Submittals section of this specification:
 1. All parts of brass products and fittings that come into contact with potable water must be constructed of an alloy with the following Copper Alloy Unified Number System (UNS) designations: C89833, C87850, C27451, C69300; or
 2. The copper alloy must be annealed with documentation provided; or
 3. The copper alloy must be tested for:
 - a. ISO 6509-1 and 6509-2; Dezincification resistance with acceptance criteria of:
 - 1) Maximum depth dezincification of 200 microns in any one location, and
 - 2) Average depth dezincification of 100 microns or less, and
 - b. ISO 6957 Resistance to stress corrosion per the latest version of ISO 6957.
- B. Piping 4-inch and larger:
 1. Ductile iron unless otherwise specified below or indicated on the Drawings.
 2. Grooved joint pipe may be used where flanged joint pipe is indicated on the Drawings.
- C. Provide taps at locations indicated on the Drawings.

- D. Fasteners: Type 304 or 316 stainless steel for pipe submerged and within 18 inches of the high water surface, and pipe located in a wet well.
- E. Dielectric Unions: Provide dielectric unions with appropriate end connections for the pipe materials in which installed (screwed, soldered, or flanged), which effectively isolate dissimilar metals, prevent galvanic action, and stop corrosion.

2.02 DUCTILE IRON:

- A. Pipe:
 - 1. Flanged: AWWA C115.
 - 2. Grooved:
 - a. AWWA C151.
 - b. Rigid joint unless shown on the Drawings as flexible.
 - c. Minimum thickness class: AWWA C606.
 - 3. Flanges: Ductile iron.
- B. Fittings:
 - 1. Ductile iron.
 - 2. Flanged joint fittings:
 - a. AWWA C110.
 - b. Fittings not covered by AWWA C110:
 - 1) Laying dimensions: ANSI B16.1 Class 125; manufacturer's standard for fittings not covered by ANSI B16.1.
 - 2) Thickness design and pressure rating: AWWA C110.
 - c. Grooved joint:
 - 1) AWWA C110 for fitting center-to-end dimensions.
 - 2) AWWA C110 or C153 for wall thickness design and pressure rating.
 - 3) AWWA C606 for rigid grooves.
- C. Gaskets:
 - 1. In accordance with AWWA C115, Appendix A, Section A.2.
- D. Fasteners:
 - 1. In accordance with AWWA C115, Appendix A, Section A.1.
 - 2. Cast iron flanges with ring gaskets:
 - a. Bolts: ASTM A307 Grade B.
 - b. Nuts: ASTM A563 Grade A Heavy Hex.
- E. Outside coating: Shop prime uncoated pipe and fittings in accordance with Section 09 96 00 – High-Performance Coatings.
- F. Lining:
 - 1. Cement-mortar, standard thickness, pipe and fittings.

2.03 STAINLESS STEEL PIPE (SS):

- A. General:
 - 1. Pipe: ASTM A778.
 - a. Weld point: Type 304L, Schedule. 10S.
 - b. Threaded: Type 304 or 304L, Schedule. 40S.
 - 2. Fittings:
 - a. Butt weld: ASTM A778, Type 304L.
 - b. Threaded: MSS-SP-114 for dimensions, ANSI B1.20.1; Class 150 for pipe threads.

- c. Flanged: AWWA C207, Class D unless otherwise indicated.

2.04 POLYVINYL CHLORIDE (PVC) PIPE:

A. General:

1. Materials: ASTM D 1784, Class 12454-B.
2. Pipe: ASTM D 1785, Schedule 80.
3. Fittings:
 - a. Socket: ASTM D 2467, Schedule 80.
 - b. Threaded: ASTM D 2464, Schedule 80. Use only to connect to threaded appurtenances.
4. Joint primer: ASTM F 656; solvent cement: ASTM D 2564.

2.05 WALL AND FLOOR PENETRATIONS:

A. General:

1. Wall sleeves: Use either steel or plastic sleeves unless otherwise noted.
2. Floor Sleeves: Use only steel sleeves.

B. Plastic sleeves:

1. Material: High density polyethylene.
2. End caps with nailing flanges that can be attached to wall forms and prevent movement during wall pouring.
3. Water ring:
 - a. Provide when indicated on the Drawings.
 - b. Ring outside diameter shall be 4-inches greater than the outside diameter of the sleeve.
 - c. Full circle.
4. Sleeve diameter: Coordinate with modular mechanical seal.
5. Manufacturers and model:
 - a. Advance Products & Systems, Inc., Infinity
 - b. Pipeline Seal and Insulator, Inc., Century-Line.
 - c. Or equal.

C. Steel sleeves:

1. Pipe: ASTM A53, Grade A, Type E or S.
2. Standard weight.
3. Hot dip galvanize in accordance with ASTM A123 with a minimum of 2 ounces per square foot.
4. Water ring and floor support ring:
 - a. Provide when indicated on the Drawings.
 - b. Ring outside diameter shall be 4-inches greater than the outside diameter of the sleeve.
 - c. Full circle.
 - d. Continuous weld to sleeve.
5. Sleeve diameter: Coordinate with modular mechanical seal.
6. Provide threaded couplings welded to sleeve for mechanical seal retainers where a mechanical retaining assembly is indicated on the drawings.

D. Modular mechanical seal:

1. Interlocking links shaped to continuously fill the annular space between pipe and wall opening.
2. Provide leak-free seal between passing pipe and sleeve.
3. Materials of construction:

- a. Links: EPDM.
- b. Pressure plates: Glass reinforced nylon.
- c. Bolts and nuts: 316 Stainless steel.
- 4. Furnish mechanical retaining assemblies at the locations indicated on the Drawings.
- 5. Manufacturers and models:
 - a. Advance Products & Systems, Incorporated, Innerlynx.
 - b. Calpico, Incorporated, Sealing Linx.
 - c. Pipeline Seal and Insulator, Inc., Link Seal.
 - d. Or equal.

2.06 WALL PIPE:

- A. General:
 - 1. Use with mud valves and where specifically named on the Drawings.
 - 2. Pipe: AWWA C151 Special Class 53.
 - 3. Water stop:
 - a. Weld both sides of collar.
 - b. Height: 1.3 inch minimum.
 - 4. Flanges and mechanical joint bells: Tapped for studs to enable assembly of joints flush with the wall face.

2.07 COUPLINGS:

- A. Bolted sleeve-type for air service:
 - 1. AWWA C219.
 - 2. Center sleeve thickness: Same or greater than pipe where coupling is installed.
 - 3. Marking: Rated working pressure.
 - 4. Center sleeve and end rings: Stainless steel, type 304L.
 - 5. Fasteners: 300 series stainless steel.
 - 6. Gaskets: Rated for 250 degrees F minimum.
 - 7. Light pattern coupling.
 - 8. Manufacturers:
 - a. Dresser Industries.
 - b. Smith-Blair, Incorporated.
 - c. Power Seal.
- B. Grooved pipe couplings for air service:
 - 1. AWWA C606.
 - 2. Coating: Paint in accordance with Section 09 96 00 – High-Performance Coatings.
 - 3. Manufacturers:
 - a. Victaulic Company of America.
 - b. Or equal.

2.08 FLANGE ADAPTER:

- A. Manufacturers and models:
 - 1. Ebba Iron Sales, Incorporated; Megaflange Series 2100.
 - 2. Victaulic Company of America; Style 341 Vic-Flange Adapter.
 - 3. Star Pipe Products; AF-4 Grooved Flange Adapter.

2.09 EXPANSION JOINT:

A. General:

1. Type: Non-Metallic expansion joint.
2. Materials of construction:
 - a. Tube: EPDM
 - b. Cover: EPDM
 - c. Backup flanges: Steel, hot dipped galvanized.
3. Service: Air at 10 psig and 210 degrees F.
4. Designed to meet or exceed the pressure, movement and dimensional rating of the Spool Type arch as shown in the Rubber Expansion Joint Division, Fluid Sealing Association "Technical Handbook - Sixth Edition" Tables IV & V.
5. Provide control unit assembly to limit axial movement of the joint.

B. Manufacturers and models:

1. PROCO Products, Inc., Series 240.
2. Or equal.

2.10 HANGERS AND SUPPORTS:

A. General:

1. Products shall be in accordance with MSS SP-58.
2. Hangers and supports for ductile iron pipe shall fit the outside diameter of the pipe.
3. Hanger and support assemblies in submerged service or within 18 inches of the high water level shall be 304 or 316 stainless steel.

B. Manufacturers:

1. Anvil International.
2. Carpenter & Patterson Co.
3. Cooper B-Line, Inc.
4. ERICO International Corporation.
5. Globe Pipe Hanger Products, Inc.
6. Or equal.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General:

1. Install all process piping and accessories in conformance with:
 - a. The Shop Drawings reviewed by ENGINEER.
 - b. The Manufacturer's recommendations.
2. Install items to be embedded before concrete is placed.
3. Fasten embedded items securely to prevent movement when concrete is placed.
4. Install items true to lines, grades, elevations, and locations as indicated on the Drawings and herein specified.

B. Wall and floor sleeves:

1. Embed in concrete or grout.
2. After pipes have been placed through wall sleeves, clean the space between the pipe and the wall sleeve and install modular mechanical seal.
3. Install where pipe penetrates floor or wall.

- C. Bolted-sleeve type couplings:
 - 1. Harness all couplings.
 - a. Steel pipe: Lugs on pipe.
 - b. Ductile iron pipe: Tie bolts installed between flanges across coupling.
 - c. Other piping materials or special circumstances: As approved by the ENGINEER.
 - 2. Restraint: In accordance with drawings, specifications and AWWA Design Manual M-11 for the pipeline pressure.
- D. Supports and hangers:
 - 1. Design of spacing and location for pipe supports and hangers shall be the responsibility of CONTRACTOR unless otherwise indicated on the drawings.
 - 2. Select hangers and supports in accordance with MSS SP-58.
 - 3. Install supports and hangers at less than maximum spacing recommended by pipe manufacturer.
 - 4. Pipes less than 4-inches: Support from floor, wall, floor above or roof.
 - 5. Pipes 4-inch to 10-inch: Support from floor, wall or floor above. Coordinate with ENGINEER when support from roof is desired to insure that the structure is capable of supporting pipe weight.
 - 6. Pipes 12-inch and larger: Support from floor below. Coordinate with ENGINEER when support from other structures such as walls, floor above and roof to insure that the structure is capable of supporting pipe weight.
 - 7. Adjust supports and hangers to bring pipe lines to proper elevations.
 - 8. Install embedded inserts flush with surface and capable of developing the full strength of the bolt.

3.02 PAINTING:

- A. Paint pipe, fittings, supports, hangers, sleeves and accessories in accordance with Section 09 96 00 – High-Performance Coatings.

3.03 TESTING:

- A. General:
 - 1. Hydrostatically test process pressure piping lines.
 - 2. Tests shall be witnessed by a Representative of ENGINEER.
 - 3. Provide all necessary equipment (pumps, plugs, hoses, gages, etc.) to perform tests.
- B. Procedure:
 - 1. Pressure test procedure shall be in conformance with AWWA C 600, Section 4.
 - 2. Duration: 2 hours.
 - 3. Pressure: Maintain 150 pound per square inch.
 - 4. Makeup water: From measurable source.
 - 5. Maximum allowable leakage:

$$L = \frac{S \times D \times \sqrt{P}}{148,000}$$

Where:

- L = Allowable leakage, gallons per hour.
- S = Length of pipe tested, feet.
- D = Nominal diameter of pipe, inches.
- P = Average test pressure, pounds per square inch, gage.

- 6. No visible leaks.

C. Repairs:

1. In case of leakage under test, the leaks shall be discovered and repaired in an approved manner and the Section again tested until a satisfactory test is secured.

3.04 CLEANING:

A. Thoroughly clean all installed materials and products and related areas:

1. Prior to acceptance of the work of this Section.
2. In accordance with Section 01 74 00 – Cleaning and Waste Management.

END OF SECTION

SECTION 40 05 23

PROCESS VALVES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and installation of valves, actuators and accessories required for the process piping system and equipment as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Work included:
 - 1. The work under this Section includes all valves and operators in the process piping system as defined in Section 40 23 00 - Process Piping.
- C. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the Work of this Section shall comply with the following:
 - 1. ASTM Specification:
 - a. A126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
 - b. A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
 - c. A536 - Ductile Iron Castings.
 - 2. AWWA Standards:
 - a. C111 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron.
 - b. C504 - Rubber-Seated Butterfly Valves.
 - c. C508 - Swing-Check Valves for Waterworks Service, 2-in. through 24-in. NPS.
 - d. C509 - Resilient-Seated Gate Valves for Water Supply Service.
 - e. C512 - Air-Release, Air/Vacuum, and Combination Air Valves for Water Supply Service.
 - f. C515 - Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
 - g. C517 - Resilient-Seated Cast-Iron Eccentric Plug Valves.
 - h. C530 - Pilot Operated Control Valves.
 - i. C541 - Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates.
 - j. C542 - Electric Motor Actuators for Valves and Slide Gates.
 - k. C550 - Protective Epoxy Interior Coatings for Valves and Hydrants.
 - 3. American Society of Sanitary Engineering (ASSE) Standards:
 - a. 1013 - Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers.

1.03 SUBMITTALS:

A. Pre-Construction:

1. Submit in accordance with Section 01 33 00 - Submittals.
2. Shop Drawings:
 - a. Submit for valves and actuators:
 - b. Required information:
 - 1) Dimensions.
 - 2) Details of construction and installation.
 - 3) Name of Manufacturer.
 - 4) Model.
 - 5) Materials.
 - 6) Coating systems.
3. Installation instructions:
 - a. Submit complete Manufacturer's installation instructions for all products.

B. Post Construction:

1. Operation and maintenance manuals:
 - a. Submit for valves and operators.
 - b. Required information:
 - 1) Equipment function, normal operating characteristics and limiting conditions.
 - 2) Assembly, installation, alignment, adjustment and checking instructions.
 - 3) Operating instructions for start-up, routine and normal operating, regulation and control, and shutdown and emergency conditions.
 - 4) Lubrication and maintenance instructions.
 - 5) Guide to "troubleshooting."
 - 6) Parts lists and predicted life of parts subject to wear.
 - 7) Outline, cross-sections, assembly drawings, and engineering data.
2. Submit Manufacturer's certification that Products and materials comply with these Specifications.

1.04 QUALITY ASSURANCE:

A. Qualifications:

1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the reviewed Shop Drawings.

1.05 DELIVERY, STORAGE AND HANDLING:

A. Receiving and storage:

1. All materials shall be delivered in original, unbroken, brand marked containers.
2. Handle and store materials:
 - a. In a manner which will prevent:
 - 1) Deterioration or damage.
 - 2) Contamination with foreign matter.
 - 3) Damage by weather or elements.
 - b. In accordance with Manufacturer's directions.

B. Rejected material and replacements:

1. Reject damaged, deteriorated or contaminated material and immediately remove from the Site.
2. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Copper Alloy (Brass & Bronze) documentation for dezincification protection to be submitted in accordance with the Submittals section of this specification:
 - 1. All parts of brass products and fittings that come into contact with potable water must be constructed of an alloy with the following Copper Alloy Unified Number System (UNS) designations: C89833, C87850, C27451, C69300; or
 - 2. The copper alloy must be annealed with documentation provided; or
 - 3. The copper alloy must be tested for:
 - a. ISO 6509-1 and 6509-2; Dezincification resistance with acceptance criteria of:
 - 1) Maximum depth dezincification of 200 microns in any one location, and
 - 2) Average depth dezincification of 100 microns or less, and
 - b. ISO 6957 Resistance to stress corrosion per the latest version of ISO 6957.

2.02 VALVES AND ACTUATORS:

- A. General:
 - 1. Valve opening direction: Counterclockwise on valves 4-inches and larger.
 - 2. Valves 6 feet or more above the floor shall have chainwheel operator.
 - 3. All valves of each type shall be the product of one Manufacturer.
 - 4. Size, quantity and valve actuators are presented in the valve schedule shown on the Drawings.
 - 5. Valve service (open/close or modulating) is presented in the valve schedule shown on the Drawings.
 - 6. Valves are generally shown on the Drawings as flanged. Contractor has the option of providing grooved end valves in place of flanged valves.
 - 7. Exterior surface coating:
 - a. Valves installed indoors: Prime coat metal-body valves with universal alkyd paint after blast cleaning in accordance with manufacturer's recommendations, or coat in accordance with AWWA C550.
 - b. Valves installed outdoors or submerged: Coat in accordance with AWWA C550 or in accordance with Section 09 96 00 - High-Performance Coatings.
 - 8. Valves in submerged service or within 18 inches of a liquid surface shall be equipped with Type 304 or 316 stainless steel fasteners.

2.03 VALVE ACTUATORS:

- A. Handwheel operated:
 - 1. Indicate direction to open or direction to close on handwheel.
 - 2. Provide a position indicator.

2.04 CHECK VALVES:

- A. Horizontal swing:
 - 1. Valve: AWWA C508.
 - 2. Lever and weight type.
 - 3. Interior coating: Coat in accordance with AWWA C550 using an epoxy certified to NSF-61 by an independent organization.
 - 4. Provide affidavit of compliance in accordance with AWWA C508 Section 6.3.

2.05 BUTTERFLY VALVES:

- A. Water service:
 - 1. Valve: AWWA C504.
 - 2. Minimum acceptable valve classification:
 - a. 20-inch diameter and smaller: Class 150B.
 - 3. Position indicator: Provide on all in-plant, non-submerged valves.
 - 4. Valve shaft: Stainless steel.
 - 5. Coating:
 - a. Interior surfaces: Coat in accordance with AWWA C550 using an epoxy certified to NSF-61 by an independent organization.
 - b. Exterior surfaces: Paint in accordance with Section 09 96 00 – High-Performance Coatings.
 - c. Flange faces: In accordance with AWWA C504.
 - 6. End connection: Flanged.

2.06 GATE VALVES:

- A. 2-1/2 inch diameter and smaller:
 - 1. In conformance with MSS SP-80.
 - 2. Materials of construction:
 - a. Bonnet, body and wedge: Bronze ASTM B-62.
 - b. Handwheel: Malleable iron ASTM A-47.
 - 3. Rising stem, solid wedge.
 - 4. Pressure rating: minimum 200 psi non-shock cold working pressure.
 - 5. Manufacturers:
 - a. Crane.
 - b. Lunkenheimer.
 - c. Nibco.
 - d. Or equal.
- B. 3-inch to 30-inch diameter:
 - 1. Valves: AWWA C515 or C509.
 - 2. Coating:
 - a. Interior surfaces: Coat in accordance with AWWA C550 using an epoxy certified to NSF-61 by an independent organization.
 - 3. Provide affidavit of compliance in accordance with AWWA C509/C515 Section 6.3.

2.07 BACKFLOW PREVENTER:

- A. General:
 - 1. Reduced pressure principle assembly: AWWA C511.
 - 2. ASSE Listed 1013.
 - 3. Materials of construction:
 - a. Bronze body.
 - b. Cover bolts: Stainless steel.
 - c. Replaceable polymer check seats for first and second checks.
 - d. Removable stainless steel relief valve seat.
 - e. Silicone rubber disc material in the first and second check plus the relief valve.
 - 4. Inlet and outlet connections: Bronze union.
 - 5. Quarter turn, full port, resilient seated, bronze ball valve shutoffs.
- B. Manufacturer and model:
 - 1. Watts Regulator Company, Series 009.
 - 2. Wilkins, Model 375.
 - 3. Or equal.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install in conformance with:
 - 1. The Shop Drawings reviewed by ENGINEER.
 - 2. The Manufacturer's recommendations.
- B. Chemical feed systems:
 - 1. Materials of construction shall be compatible with the chemical service.
- C. Check and adjust valves, operators and accessories for smooth operation.
- D. Provide pipe support at valves.
- E. Paint valves and accessories in accordance with Section 09 96 00 – High-Performance Coatings.

3.02 CLEANING:

- A. Thoroughly clean all installed materials and products and related areas:
 - 1. Prior to acceptance of the work of this Section.
 - 2. In accordance with Section 01 74 00 – Cleaning and Waste Management

END OF SECTION

SECTION 43 21 43
PROCESS SUMP PUMPS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and installation of 2 submersible sump pump and appurtenances as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 01 of these Specifications.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Pumps (2):
 - 1. Design point: Max flow 1750 GPH at 0 ft.
 - 2. 1-inch discharge connection.
 - 3. Power: Power cord, 25-ft minimum length.
 - a. 120 AC, 60 Hz
 - 4. Horsepower: 1/4.
 - 5. Motor:
 - a. Encased in pump.

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittals.
- B. Shop Drawings:
 - 1. Submit for sump pump, basin and appurtenances.
 - 2. Required information:
 - a. Manufacturer's sales literature and performance data.
 - b. Dimensions.
 - c. Details of construction and installation.
 - d. Name of Manufacturer.
 - e. Model.
- C. Operation and maintenance manuals:
 - 1. Submit for sump pump system.
 - 2. Required information:
 - a. Equipment function, normal operating characteristics and limiting conditions.
 - b. Assembly, installation, alignment, adjustment and checking instructions.
 - c. Operating instructions for start-up, routine and normal operating; regulation and control, and shutdown and emergency conditions.
 - d. Guide to "troubleshooting".

1.04 QUALITY ASSURANCE:

A. Qualifications:

1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the reviewed Shop Drawings.

1.05 DELIVERY, STORAGE AND HANDLING:

A. Receiving and storage:

1. All materials shall be delivered in original, unbroken, brand marked containers or wrapping as applicable.
2. Handle and store materials:
 - a. In a manner which will prevent:
 - 1) Deterioration or damage.
 - 2) Contamination with foreign matter.
 - 3) Damage by weather or elements.
 - b. In accordance with Manufacturer's directions.

B. Rejected material and replacements:

1. Reject damaged, deteriorated or contaminated material and immediately remove from the Site.
2. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 MANUFACTURERS AND MODELS:

1. Drummond.
2. Or Engineer Approved equal.

2.02 PUMP:

A. General:

1. Installation type: Removable, wet well arrangement with hose connection to discharge.
2. Automatic start-up when water is detected.

B. Cooling System:

1. Motors are sufficiently cooled by the surrounding environment or pumped media. A water cooling jacket is not required.

C. Strainer Base

1. Pump shall be furnished with a removable strainer base.
 - a. Minimum water drawdown to 3/4" with strainer base attached.
 - b. Minimum water drawdown to 3/8" without strainer base attached.

D. Discharge:

1. 1" NPT with 3/4" garden hose adapter.
2. 3/4" garden hose shall be supplied with pump
3. Provide 3/4" NPT by 1" PVC adapter to connect hose discharge to PVC pipe.

E. Accessories

1. Pump shall include:
 - a. Integral check valve
 - b. 25 ft. (min) positioning rope

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install equipment in conformance with:
 1. Shop Drawings reviewed by ENGINEER.
 2. The Manufacturer's recommendations.

3.02 CLEANING

- A. Thoroughly clean all installed materials and products and related areas:
 1. Prior to acceptance of the work of this Section.
 2. In accordance with Section 01 74 00 – Cleaning and Waste Management

END OF SECTION

SECTION 46 41 23
SUBMERSIBLE MIXERS

PART 1 - GENERAL

1.01 EQUIPMENT OVERVIEW

- A. This Section includes, but is not necessarily limited to, the furnishing and installation of a potable tank mixer as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.

1.02 REFERENCES

- A. Occupational Safety and Health Administration, OSHA
- B. Department of Transportation, DOT
- C. NSF / ANSI Standard 61
- D. Underwriters Laboratories Inc., UL 508
- E. American Water Works Association (AWWA)

1.03 QUALITY ASSURANCE

- A. Continuous Operation Equipment. The mixer shall operate continuously using 120 VAC as the power source.
- B. No Visual Defects. The mixer shall have no visual defects, and shall have high quality welds, assembly, and corrosion resistant finish.
- C. Qualified US Manufacturer. The manufacturer of the mixer shall have extensive experience in the production of such equipment, and the equipment shall be manufactured in the continental United States.
- D. Warranty. The mixer shall be warranted to be free of defects in materials and workmanship for a period of 5 years. This equipment warranty would run directly from the manufacturer of the equipment to the owner.

1.04 SUBMITTALS

- A. The awarded Bidder shall provide an electronic copy of the following documents. Upon acceptance of these documents by the Engineer, the Bidder will be issued a Notice to Proceed, and may then proceed to place the equipment.
 - 1. Manufacture Qualification Document
 - 2. List of Supplied Equipment
 - 3. Manufacturer Product Sheets
 - 4. Electric Power Source Requirements
 - 5. NSF / ANSI Standard 61 Documentation
 - 6. Warranty Statement
 - 7. Operation Manuals

1.05 FIELD SERVICES

- A. Placement and startup. Equipment manufacturer shall offer placement and startup performed by equipment manufacturer's full time factory employees trained in the operation of the mixer who have completed OSHA safety trainings applicable to this type of equipment placement and startup.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. The mixer shall be Medor GridBee GS-9, , or equal.

2.02 PERFORMANCE AND FEATURES

- A. The mixer shall mix the existing elevated storage tank which is a 750,000-gallon single-leg tank.
- B. Complete Water Circulation Required. To meet the project objectives, the tank or reservoir circulation shall be achieved by a single unit within the reservoir capable of providing long distance circulation of water. The mixer shall have a direct measurable flow rate where suction shall enter specified mixer's intake positioned within 2 inches of reservoir floor and discharging water vertically in a sheet flow pattern to induce a large volume, low velocity flow to reach the tank or reservoir water surface. The mixer must be placement flexible in design to allow best hydraulic positioning for tank or reservoir conditions to prevent hydraulic short circuiting within tank or reservoir. Suction within 2 inches of tank or reservoir floor is not allowed.
- C. Complete Mix: The mixer manufacturer guarantees that the subject tank will be completely mixed by the mixer. In continuous operation of the mixer:
 - 1. at least once per 24 hours all water temperatures within the tank shall converge to within 0.8 degrees C, and
 - 2. at least once per 72 hours all chlorine concentrations within the tank shall converge to within 0.18 mg/l.
- D. Fit Through Small Hatch Opening. The mixer shall be capable of fitting through a clear, unobstructed opening of 12" diameter without requiring disassembly.
- E. Continuous Operation with 120VAC, 20 Amp Power Source. The mixer shall operate continuously while connected to electric power.
- F. Stainless Steel Construction. The mixer shall be constructed primarily of Type 316 stainless steel metal for strength and superior corrosion resistance.
- G. Motor. The mixer shall be mechanically operated by a submersible motor that meets the following criteria.
 - 1. Direct Drive, with no gearbox and no lubrication maintenance required.
 - 2. Designed for submersible operation. Mixer design shall include flow sleeve or housing around motor to provide water flow past motor per submersible motor design criteria to lower the total motor temperature and increase winding life.
 - 3. Designed for Continuous Operation without overheating or compromising motor life expectancy. Constant, full speed operation, variable frequency drive or other method of speed reduction not required and not allowed.
 - 4. 120 VAC, 20 Amp power source.

- H. Exposed Rotating Protection. The mixer shall not have any rotating equipment openly exposed. Rotating shafts, impellers, and motors shall not be openly exposed, and in the event of any part of the mixer exterior contacting the floor or cord, it shall not cause damage to either.
- I. Low Elevation Intake: The mixer shall be supplied with an intake capable of being positioned at the lowest elevation of the tank or reservoir floor. The intake level shall bring water into the mixer at horizontal layer within 2 inches of the tank or reservoir floor to prevent hydraulic short circuiting of inflow water through the tank.
- J. Restraint System. The mixer shall not require any brackets, penetrations, rope, ties, or fixed connections to the tank or reservoir columns, walls, or floor below the overflow elevation. The mixer shall allow for placement and servicing without requiring tank or reservoir to be drained. The mixer shall not require the use of a diver or diving team to enter the tank or reservoir to complete placement or service of the specified equipment.
- K. Functional for All Water Levels. The mixer shall function properly and not be negatively impacted by fluctuating water levels down to 24 inches of water depth. Devices requiring more than 24 inches of water depth to properly function without damage not allowed.
- L. Electrical Control Box. The mixer equipment shall be supplied with a Control Box capable of disconnecting 120 VAC outgoing power to the mixer equipment and meeting the following criteria:
 - 1. NEMA 4 enclosure shall be provided with protection against condensation and moisture in a marine environment.
 - 2. Control Box shall be UL 508 Listed for sound electrical design and safety.
 - 3. Control Box shall include exterior mounted HOA switch, definite purpose contactor for mixer control, exterior display showing green run, red fault indication, and motor operating amperage, grounding lug, 120 VAC standard three-prong male molded plug, and locking latch for security.
 - 4. Control Box shall include configurable open collector outputs for run and fault indication, or 4-20 mA analog output scaled to motor current. Control Box shall include a 24 VDC relay to allow for remote on and off control of the mixer. Integration of 4-20 mA output and remote on/off relay into site PLC/RTU shall be provided.
 - 5. Control Box requires a 120 VAC power source, Minimum 20 Amp rated service located near the final placement of the Control Box.
- M. Chlorine Boost Connection: The mixer shall be supplied with a connection point for injection of sodium hypochlorite. The connection point shall be provided with a 1/2" cap for a future connection to a 1/2" diameter hose and be rated for contact with 12.5% Sodium Hypochlorite solution.
- N. The complete mixer shall be NSF / ANSI Standard 61 and NSF / ANSI Standard 372 listed for safe contact with potable water. The mixer shall be NSF / ANSI Standard 61 listed to be safely in contact with a potable water volume as low as 5,000 gallons.
- O. Maintenance Requirements. The mixer shall operate normally with the following maintenance features.
 - 1. No scheduled lubrication is required of any system components including motor.
 - 2. No spare parts shall be required to be kept on hand.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Coordinate Site access and staging area with Owner prior to mobilization.

- B. Installation of mixer shall be in accordance with the manufacturer's recommendations and these specifications.

3.02 DISINFECTION

- A. The mixer and all appurtenances that will be in contact with the potable water shall be disinfected per AWWA C652 Chlorination Method 2 prior to installation.

END OF SECTION

SECTION 46 61 23.01

GRAVITY FILTER REHABILITATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the inspection and upgrades of the rapid gravity filters at the Marine City Water Treatment Plant as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 - 2. Existing filter:
 - a. Filter No. 1: Rapid Gravity Filter with lateral underdrains and surface wash.
 - b. Filter No. 2 Rapid Gravity Filter with lateral underdrains and surface wash.
 - c. Filter No. 3: Rapid Gravity Filter with tile underdrain and surface wash.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 01 21 13 – Cash Allowances.
 - c. Section 09 96 00 – High-Performance Coatings.

1.02 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. Occupational Safety and Health Act.
 - 2. NSF - Standard 61 - Drinking Water Systems Components - Health Effects
 - 3. American National Standard Institute (ANSI).
 - 4. American Society of Mechanical Engineers (ASME).
 - 5. American Society of Testing and Materials (ASTM).
 - 6. American Water Works Association (AWWA).
 - 7. 2021 International Building Code (IBC)

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – Submittals.
- B. Shop Drawings:
 - 1. Submit for the underdrain system.
 - a. Required information:
 - 1) Name of Manufacturer.
 - 2) Material Safety Data Sheets.
 - 3) Drawings.
 - 4) Details of installation.
 - 5) Assembly, installation, alignment, adjustment and checking instructions.
 - 6) Detailed start-up, hydraulic, and backwash test procedures.
 - 2. Submit for the surface wash system.
 - a. Required information:
 - 1) Name of Manufacturer.

- 2) Material Safety Data Sheets.
 - 3) Drawings.
 - 4) Details of installation.
 - 5) Assembly, installation, alignment, adjustment and checking instructions.
 - 6) All electrical equipment, electrical enclosures and instrumentation.
3. Submit for the filter media.
 - a. Required information:
 - 1) Name of Manufacturer.
 - 2) Media type, size, uniformity coefficient, quantity.
 - 3) Details of installation.
 4. Operation and maintenance manuals:
 - a. Submit for all equipment.
 - b. Required information:
 - 1) Equipment function, normal operating characteristics and limiting conditions.
 - 2) Assembly, installation, alignment, adjustment and checking instructions.
 - 3) Operating instructions for start-up, routine and normal operating, regulation and control, and shutdown and emergency conditions.
 - 4) Lubrication and maintenance instructions.
 - 5) Guide to "troubleshooting".
 - 6) Parts lists and predicted life of parts subject to wear.
 - 7) Outline, cross-sections, assembly drawings, engineering data and wiring diagrams.
 - 8) Test data and performance curves.
 - 9) Copies of all approved Shop Drawing submittals.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the reviewed submittals.
- B. Manufacturer's services:
 1. Submit Manufacturer's sworn statement that the equipment furnished complies with this Specification.
 2. Provide Manufacturer's field service.

1.05 WARRANTY

- A. The System Manufacturer shall guarantee the equipment against defects in materials and workmanship under normal use and service, to the original purchaser, for a period of five (5) years from date of equipment startup by an authorized technician.

1.06 DESIGN CONDITIOINS

- A. Design Capacity: 0.7 MGD per filter
- B. Backwash:
 1. Backwash rate: 15 gpm/sft
 2. Surface wash

C. Filter Area: 14ft x 14 ft

1.07 DELIVERY, STORAGE AND HANDLING

A. Receiving and storage:

1. All materials shall be delivered in original, unbroken, brand marked containers or wrapping as applicable.
2. Handle and store materials:
 - a. In a manner which will prevent:
 - 1) Deterioration or damage.
 - 2) Contamination with foreign matter.
 - 3) Damage by weather or elements.
 - b. In accordance with Manufacturer's directions.

B. Rejected material and replacements:

1. Reject damaged, deteriorated, or contaminated material and immediately remove from the Site.
2. Replace rejected materials with new materials at no additional cost to OWNER.

C. Handle so as to prevent damage to equipment during handling and transportation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable underdrain and backwash system manufacturers:

1. Robert's
2. Or ENGINEER approved Equal.

B. Media replacement shall be provided by FILTRATION EQUIPMENT MANUFACTURER.

2.02 SYSTEM

A. Each underdrain system shall include:

1. Type 316L stainless steel laterals.
2. Type 316L stainless steel inlet/outlet flume cover plates sealed and anchored over the recessed influent/effluent trench.
3. Type 316L stainless steel plates for closing the end of each filter block row.

B. Laterals:

1. Each lateral shall have one primary effluent collection/backwash distribution conduit and two secondary distribution conduits in distinct and separate compartments, designed to distribute water during backwashing.
2. Laterals shall discharge effluent water and receive backwash water through primary orifices located where the laterals span the flume.
3. The laterals shall be evenly spaced and anchored onto the concrete floor of each filter.
4. Any outer exposed portion of the underdrain lateral shall be seam welded to provide a complete seal. Spot welding down the length of the lateral by itself is not acceptable.
5. Center to center spacing between the filter blocks shall be a maximum of 12 inches.
6. Laterals shall be a minimum of 10.5 inches wide and cover the filter floor.
7. Laterals shall cover a minimum of 85% of the filter floor to eliminate filter dead-spots and achieve proper collection and backwashing.

8. Slots:
 - a. Media retaining slots shall be cut directly into the sides of the laterals to support media without the need for gravel, while allowing passage of water for effluent water collection and backwashing.
 - b. Louvered slots shall be supported on three sides, creating a supported opening. Louvers supported only on two sides shall not be permitted.
- C. Orifices:
 1. Laterals shall discharge effluent water and receive backwash water through primary orifices located where the laterals span the flume.
 2. Distribution orifices shall be located within each lateral to evenly control the distribution of backwash water flows along the entire lateral length.
 3. The orifices shall be designed to evenly collect filtered water and distribute backwash water by compensating for velocity and momentum changes within the flume.
 4. The center line of the flow control orifices shall be no greater than 1 inch above the lateral base.
- D. Structural Design:
 1. The filter underdrain system, including anchorage, supports, etc. shall be designed by the manufacturer to safely withstand loadings for the specified conditions.
 2. The filter underdrain system shall be designed to withstand a net downward loading of not less than 1,440 pounds per square foot, plus its own dead weight.
 3. The outer layer of the underdrain shall be a minimum of 16-gauge Type 316L stainless steel to withstand dynamic loading.
 4. The design shall adequately provide for all loads incurred during shipment, handling, and installation.
 5. Adequate safety factors shall be included in the design to account for dynamic loadings which may occur during the initiation and termination of backwash.

2.03 MEDIA

- A. Anthracite:
 1. Size: 0.90-1.10 mm.
 2. Uniformity Coefficient: 1.4.
 3. Depth of 8".
 4. An extra inch (2.54cm) of anthracite shall be supplied for backwashing and skimming of fines.
 5. The anthracite shall have a hardness of not less than 2.7 on the MOH scale and a specific gravity of not less than 1.4.
 6. It shall be free from iron sulfides, clay, shale and all foreign matter.
 7. Acid solubility shall not exceed 5 percent.
- B. Silica Sand:
 1. Size: 0.45-0.55 mm.
 2. Uniformity Coefficient: 1.4.
 3. Depth of 15"
 4. Specific Gravity not less than 2.5.
 5. An extra inch (2.54cm) of filter sand shall be supplied for backwashing and skimming of fines.
 6. The sand shall be free from clay, loam and all organic materials.
- C. Torpedo Sand:
 1. Size: 0.8-2.0 mm.
 2. Depth of 3".

3. Coarse sand shall have be 3/16" (.476cm) x #10 (.2cm).
 4. The sand shall consist of hard, rounded stones with an average specific gravity of not less than 2.5.
 5. Not more than 1 percent by weight of the material shall have a specific gravity of 2.25 or less.
 6. The coarse silica sand shall have an acid solubility of less than 5 percent.
 7. The coarse silica sand shall have an uniformity coefficient of less than 1.7.
- D. The filter media shall be in accordance with the latest revisions of AWWA B100 and shall be NSF 61 Listed.
- E. Sufficient quantities of fine filter sand and anthracite shall be furnished and installed so that the finished depths correspond to the specifications once the filter beds have been backwashed and skimmed of fines.

2.04 SURFACE WASH SYSTEM

- A. Each filter shall be equipped with one (1) surface washer assembly.
- B. Components:
1. Surface agitators:
 - a. Surface agitators shall consist of a drop pipe terminating in a rotary joint bearing assembly connected at its lower end to an arm assembly.
 2. Agitator arm unit:
 - a. Agitator arm unit shall consist of a single, continuous horizontal and curved arm fabricated of a single section of Schedule 5 Type 304 stainless steel.
 3. Rotary Joint:
 - a. The rotary joint bearing assembly shall be fusion welded directly to the horizontal arm. Units fabricated with arm assemblies of more than one piece or units using tee type assemblies shall not be allowed.
- C. Distributer Arm:
1. The distributor arm shall be provided with non-clogging nozzles threaded into its trailing edge, so spaced that the water distribution shall be substantially uniform over the entire area of influence of the rotary media agitator.
 2. Each distributor arm shall be fitted with an end cap assembly containing three (3) integral discharge nozzle openings. End Caps which are not threaded to the agitator arm shall not be allowed.
 3. A distance of 2-1/2" shall be provided between the top of the filter media and the centerline of the agitator distributor arm.
- D. Supply Piping:
1. All supply piping within the filter unit shall be Schedule 5 Type 304L stainless steel.
 2. Pipes shall be factory cut and welded to the required dimensions for field assembly.
 3. Type 304 stainless steel agitator supply header support brackets and securement hardware shall be used for adequate support of the supply piping from the wash water troughs and from the filter.
 4. Drop pipes shall be Schedule 40 Type 304 stainless steel.
 5. Dimensions:
 - a. Structural member minimum thickness:
 - 1) 3/16 inches.
 - b. U bolt minimum diameter:
 - 1) 3/8 inches

- c. Drop Pipe diameter:
 - 1) 2 inches

PART 3 - EXECUTION

3.01 MEDIA REMOVAL

- A. CONTRACTOR shall remove the existing filter media carefully to not damage any portion of the filter. The filter media shall be properly disposed of in a State approved landfill by CONTRACTOR. Any portion of the filter damaged as a direct result of the media removal shall be repaired by CONTRACTOR at no expense to OWNER.

3.02 INSTALLATION

- A. Floor preparation:
 - 1. Contractor shall remove existing filter media, underdrains, grout and supports to provide a flat level plane.
 - 2. Care shall be exercised in preparing the filter floor slab and in setting the underdrains to assure proper alignment and elevation.
 - 3. Contractor shall use min ½" of leveling grout to level the floor.
- B. Underdrain Installation
 - 1. Each filter underdrain lateral shall be anchored to the filter floor.
 - a. Anchors shall be furnished by the filter underdrain manufacturer.
 - b. Epoxy anchors shall be installed in the floor.
 - c. All laterals shall be bolted down to the floor with gaskets.
 - d. No grout shall be used to install the underdrains.
 - 2. Each stainless steel inlet/outlet flume cover plates shall be sealed and anchored over the recessed influent/effluent trench.
 - 3. Underdrain laterals shall be installed flush against the floor preventing the creation of unwashed stagnant water.
 - 4. Plates for closing the ends of each row of block shall be factory installed.
 - 5. The filter underdrain sections shall be set in place such that the water and air metering orifices are in a true and level plane within plus or minus 1/8" over the entire filter area.
- C. Media Installation
 - 1. All support gravel, sand and anthracite depths shall be marked on the filter unit walls.
 - 2. Each gravel layer shall be leveled by hand prior to placing the next layer and walking directly on the support gravel shall not be permitted.
 - 3. The fine filter sand and anthracite shall be backwashed and skimmed a minimum of three (3) times each in order to remove all fines.
 - 4. The filling of the filter with water shall only be permitted using the backwash supply and shall be under the direct control of the Owner.
 - 5. Extreme care shall be employed to insure a slow removal of all entrained air from the filter bed prior to increasing the backwash rate to maximum.
 - 6. Once the air has been removed from the filter bed, the backwash rate can then be increased to 18 gallons (43.9 M³/HR/M²) per minute per square foot of filter area or to the maximum achievable high rate normally used by the Owner, but no higher than 25 gpm/sqft (60.975 M³/HR/M²).
 - 7. Install filter media in conformance with:
 - a. The submittals reviewed by ENGINEER.
 - b. The Manufacturer's recommendations.

- D. Surface Wash Installation:
 - 1. All surface wash agitators shall be installed level and plumb.
 - 2. Follow manufacturer instructions.

3.03 PRODUCT HANDLING, STORAGE AND DELIVERY

- A. Place or store underdrains and specialties only in designated staging areas shown on the drawings and approved by the Engineer.
- B. Store underdrains and specialties off the ground, under ultraviolet-resistant tarps from time of delivery on-site until final installation of the filters.
- C. Replace, at no charge to Owner, underdrains and specialties damaged during storage and delivery.
- D. Underdrains and specialties are subject to inspection at the Engineer's request if visual evidence of damage is observed.

3.04 PAINTING (pending results of inspection report)

- A. See Section 09 96 00 High-Performance Coatings for coating requirements.

3.05 TESTING:

- A. Disinfection and Bacteriological Testing:
 - 1. Chlorination:
 - a. Disinfect each portion of the water treatment plant systems in accordance with ANSI/AWWA C653.
 - b. Observation: By CONSTRUCTION MANAGER.
 - c. Sequence: following pressure tests and flushing and prior to connection to existing water system.
 - 2. Bacteriological Testing:
 - a. Two consecutive safe bacteriological samples shall be taken 24 hours apart before placing the equipment into service.
 - b. Two samples shall be collected from each filter unit, one above the filter media and one below.
 - c. Sampling: By CONTRACTOR w/ witness by OWNER and ENGINEER, with a minimum 24 hours notice from CONTRACTOR.
 - d. Correction: Rechlorinate entire system, including filter units and piping.
 - 1) Testing/Retesting costs shall be paid for by CONTRACTOR.
- B. The filter underdrain system in each filter cell shall be given a series of visual, qualitative, flow distribution tests to verify that the underdrains are not clogged with debris and that flow distribution is uniform. These tests shall be performed before the filter media is placed.
- C. During each test, the underdrain laterals shall be visually inspected for uniform distribution of water and for any signs of quiescent zones and excessive surface turbulence.
- D. The filter underdrain shall be tested using clean, clear water from the backwash supply as per the recommendations and instructions of the manufacturer.

- E. Fifty percent or alternate bolts in a group, including at least one-half the anchors in each group shall be tested according to 2021 IBC specifications 1910A.5 Test for Post-Installed Anchors in Concrete.

3.06 FIELD QUALITY CONTROL

- A. Manufacturer's field service:
 - 1. Arrange and pay for Manufacturer's engineer to:
 - a. Provide the services indicated below.
 - b. Minimum installation supervision time: 6 days, 2 separate trips.
 - 2. Schedule the following:
 - a. To observe installation.
 - b. At times approved by ENGINEER and OWNER.
 - 3. Manufacturer's engineer: Check work.
 - 4. CONTRACTOR shall promptly make all changes and additions required by Manufacturer's engineer at no additional cost to OWNER.
 - 5. Submit Manufacturer's engineer's written approval of installation.

3.07 QUALITY ASSURANCE

- A. All materials used in contact with the water and backwash air shall meet National Sanitation Foundation (NSF) Standard 61 Drinking Water System Components - Health Effects.
- B. The dual-parallel block units with integral flow metering elements and any specialties required for installation such as special anchorage, grout retaining bridges, closures, gaskets, etc., shall be the products of a single manufacturer/supplier.

3.08 CLEANING

- A. Thoroughly clean all installed materials and products and related areas:
 - 1. Prior to acceptance of the work of this Section.
 - 2. In accordance with Section 01 74 00 – Cleaning and Waste Management
- B. The CONTRACTOR shall take all precautions recommended by the underdrain manufacturer or specified herein to ensure that the filter underdrain system and any piping communicating therewith is completely clean and free of any debris, dirt, or other foreign materials which could clog the underdrain system or interfere with flow.
 - 1. Backwash piping shall be thoroughly flushed clean.
 - 2. All loose debris and dirt within the filter cell and flume shall be removed by brooming down and vacuuming.
 - 3. Care shall be taken to keep grout from being deposited anywhere where it could interfere with flow. Any grout so deposited shall be removed.
 - 4. As installation progresses, partially completed portions of the WORK shall be protected with heavy plastic sheeting or other suitable material to maintain the cleanliness of the underdrain system.

3.09 DISINFECTION AND BACTERIOLOGICAL TESTING:

- A. Chlorination:
 - 1. Disinfect each portion of the water treatment plant systems in accordance with the latest revision of ANSI/AWWA C653.
 - 2. Observation: By Engineer
 - 3. Sequence: following pressure tests and flushing and prior to connection to existing water system.

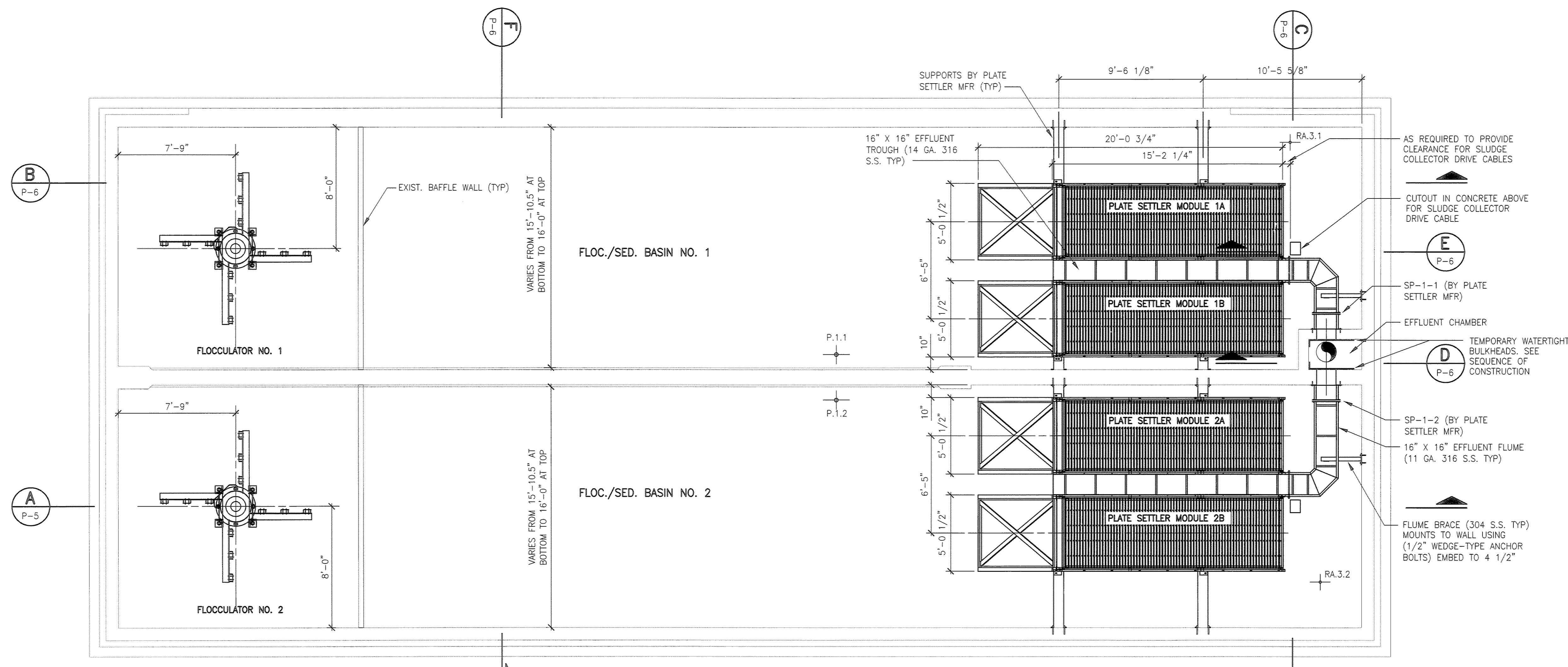
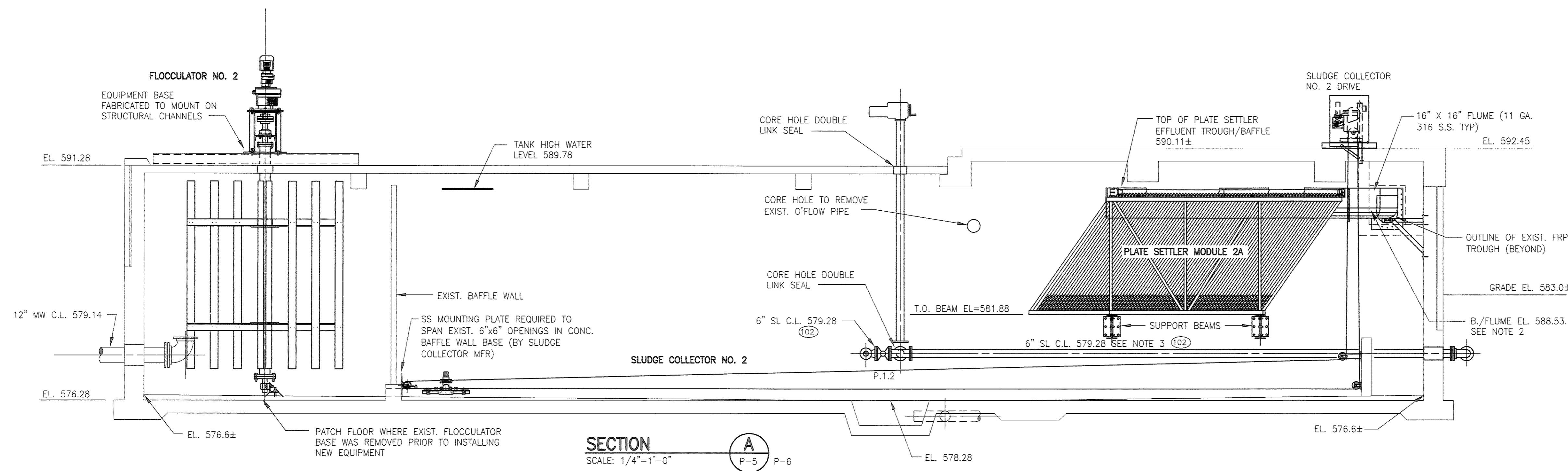
B. Bacteriological Testing:

1. Two consecutive safe bacteriological samples shall be taken 24 hours apart before placing the equipment into service.
2. Two samples shall be collected from each filter unit, one above the filter media and one below.
3. Sampling: By Contractor w/ witness by Owner/Engineer, with a minimum 24 hour notice from Contractor.
4. Correction: Re-chlorinate entire system, including filter units and piping.
 - a. Testing/Retesting costs shall be paid for by Contractor.

END OF SECTION

APPENDIX A

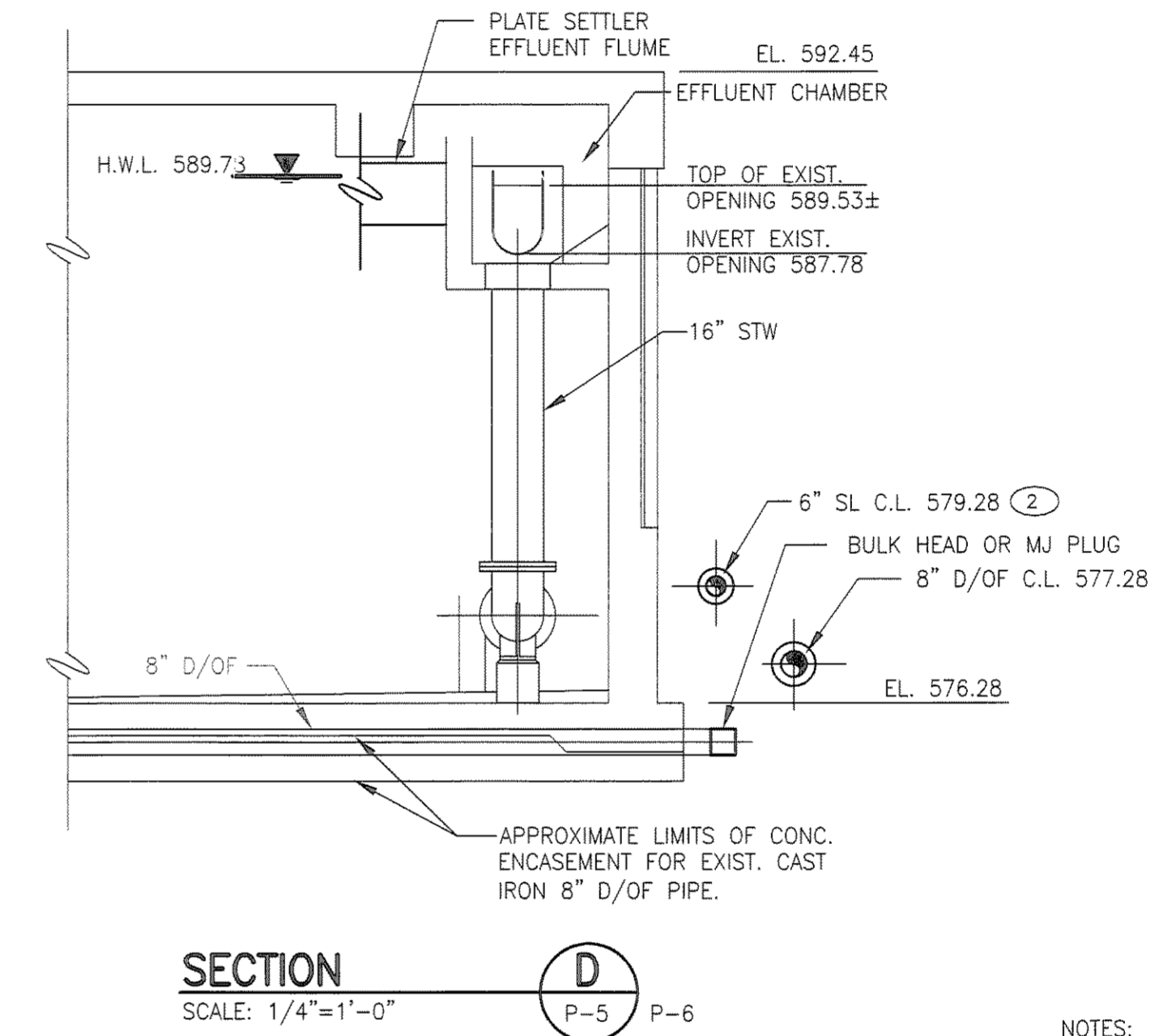
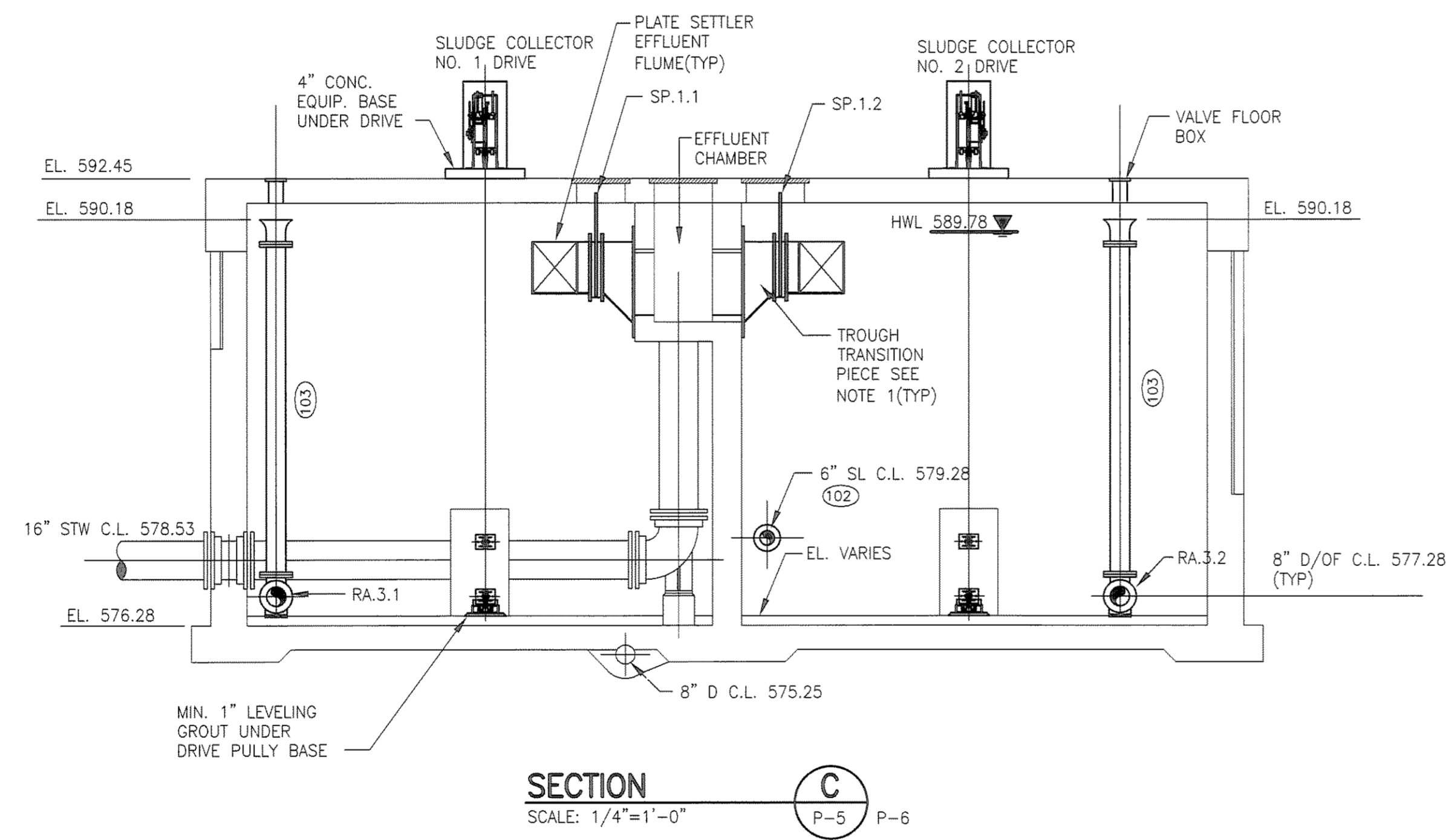
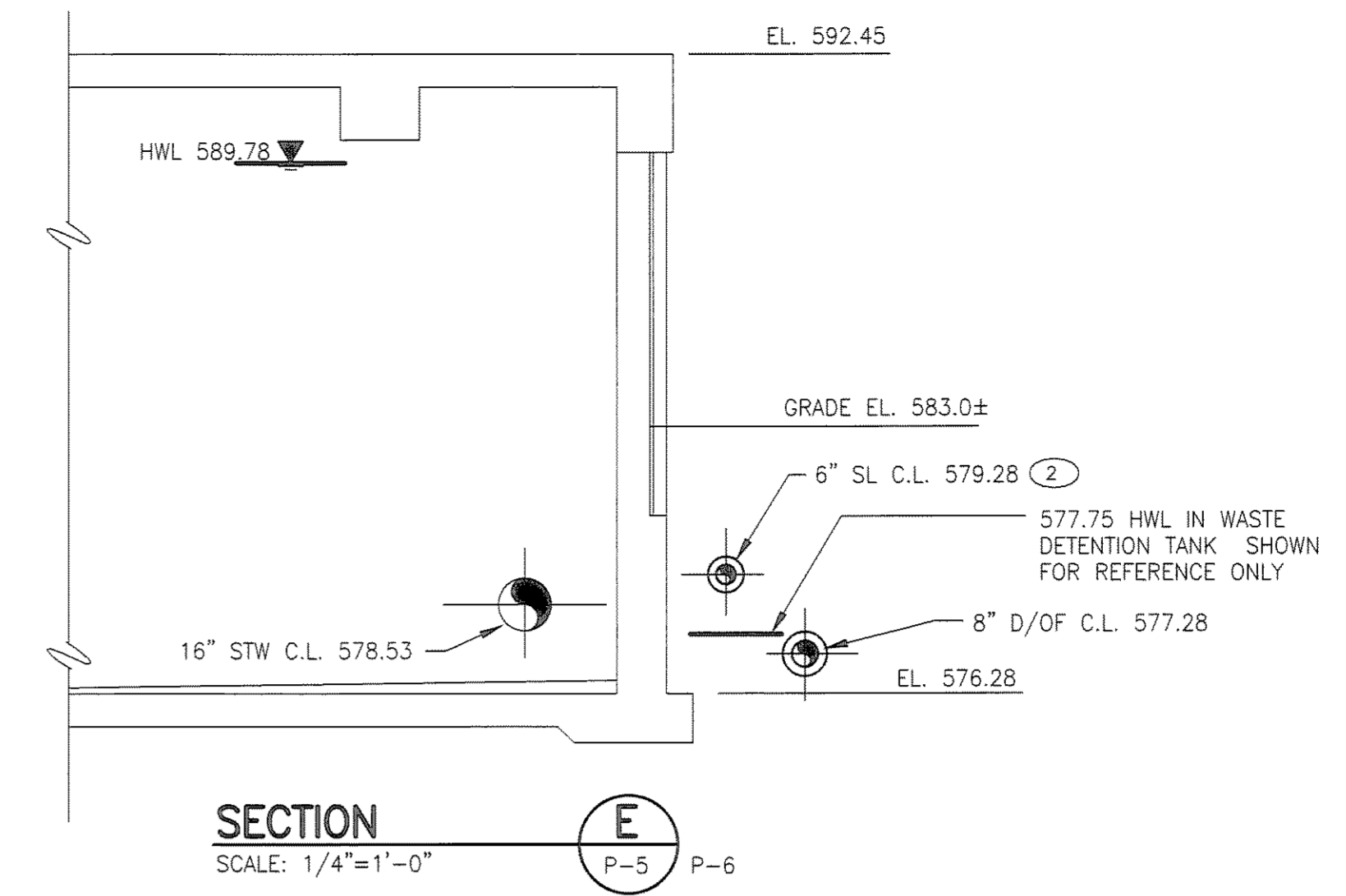
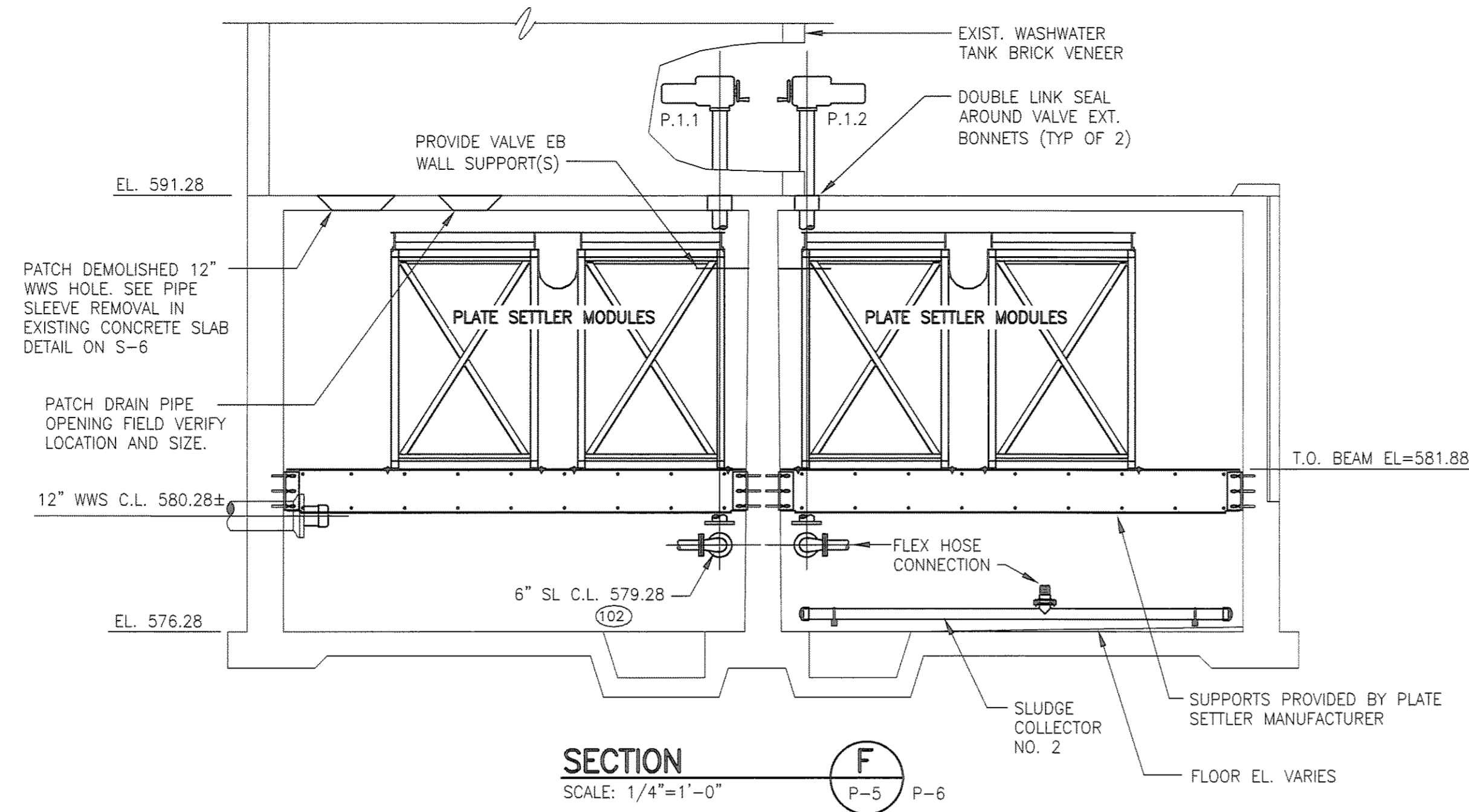
Reference Drawings



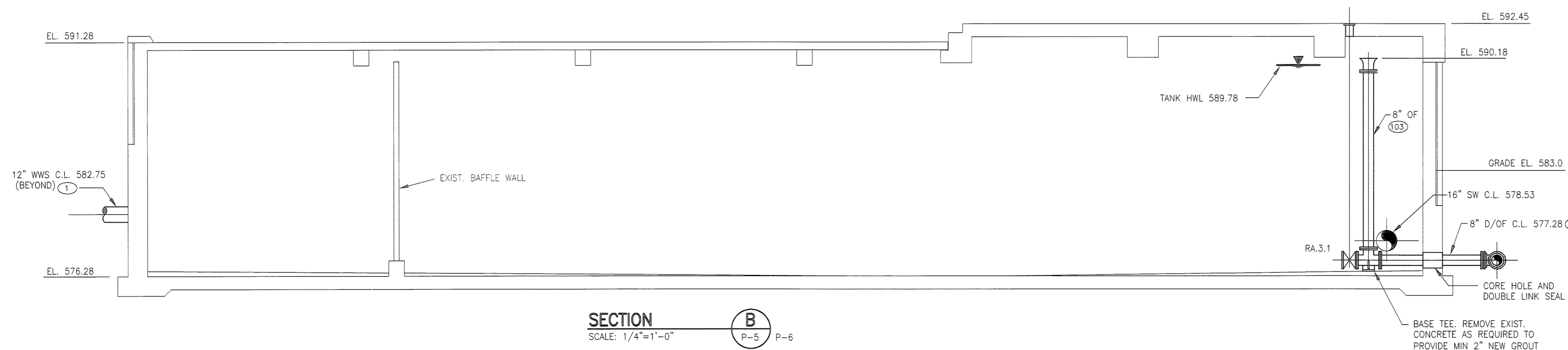
- NOTES:
- BASIN 1 AND 2 SHOW DIFFERENT PLATE SETTLER AND SLUDGE COLLECTOR LAYOUTS. EACH PLATE SETTLER AND SLUDGE COLLECTOR MFR. SPECIFIED HAS A DIFFERENT EQUIPMENT LAYOUT. CONTRACTOR IS RESPONSIBLE TO COORDINATE, DURING SHOP DRAWING PHASE, ANY AND ALL MODIFICATIONS REQUIRED.
 - THE PLATE SETTLER EFFLUENT TROUGH BOTTOM ELEVATION SHOWN REPRESENTS THE MIN. ACCEPTABLE TROUGH DEPTH. DEEPER TROUGHS MAY BE REQUIRED AS DETERMINED BY PLATE SETTLER MANUFACTURER HYDRAULIC CALCULATIONS.

**FLOCCULATION/SEDIMENTATION BASIN
HIGH LEVEL PLAN**
SCALE: 1/4"=1'-0"

CONFORMING TO CONSTRUCTION RECORDS	12/2007			
ISSUED FOR BIDS	06/2005			
REV	DESCRIPTION	BY	DATE	CHK'D
DESIGNED	R.KALIMAN	CHECKED	T.LARDER	
SCALE	AS NOTED	CADD DATE	12/16/05	KMU 07
FILE	0:\0188209\00\B\FLOCCSED\BANK.DWG			
MARINE CITY, MICHIGAN WATER TREATMENT PLANT IMPROVEMENTS				
PIPEWORK FLOCCULATION/SEDIMENTATION BASINS HIGH LEVEL PLAN AND SECTIONS				
DIVISION	CONTRACT	SHEET		
	0573057-W-1	P-5		OF 11



- NOTES:
1. PLATE SETTLER EFFLUENT TROUGH FLANGE SHALL CONNECT TO THE EXIST. CONC. WITH EXPANSION BOLTS, GASKET AND SEALANT MATERIAL. CONTRACTOR RESPONSIBLE TO DEMOLISH THE EXISTING TROUGH AND TO BRING THE EXIST. CONCRETE SURFACE WITHIN THE TOLERANCES REQUIRED FOR WATER TIGHT CONNECTION. CONTRACTOR SHALL PLAN ON GRINDING AND PATCHING AS A MINIMUM. ALTERNATIVE METHODS FOR THIS CONNECTION ARE ACCEPTABLE FOR REVIEW DURING SHOP DRAWING SUBMITTALS IF CONTRACTOR AND MANUFACTURE HAVE A BETTER METHOD.



CONFORMING TO CONSTRUCTION RECORDS	12/2007			
ISSUED FOR BIDS	06/2005			
REV	DESCRIPTION	BY	DATE	CHK'D
TETRA TECH MPS				
DESIGNED R.G.K.	CHECKED T.LARDER			
SCALE AS NOTED	CADD DATE 12/16/05	KMU 07		
FILE 0:\0186209\3\0\B\FLOCC&SED.TANK.DWG				
MARINE CITY, MICHIGAN WATER TREATMENT PLANT IMPROVEMENTS				
PIPEWORK FLOCC./SED. BASINS SECTIONS				
DIVISION	CONTRACT	SHEET		
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