

SPECIFICATIONS
FOR
FLINT WATER POLLUTION CONTROL FACILITY
SECONDARY CLARIFIER REHABILITATION PROJECT
SRF PROJECT NUMBER 5709-01

CITY OF FLINT
FLINT, MICHIGAN

JUNE 2021

Issued for Bids

HRC JOB NO. 20200783



555 Hulet Drive • PO Box 824
Bloomfield Hills, Michigan 48303-0824

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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 where the bidding procedures are to be administered.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the advertisement or invitation to bid may be obtained from the Issuing Office. The deposit will be refunded to each document holder of record who returns a complete set of Bidding Documents in good condition within 30 days after opening of Bids.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, within 3 days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below.
- 3.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01 *Subsurface and Physical Conditions*

A. The Supplementary Conditions identify:

1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site.
2. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. Copies of reports and drawings referenced in Paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.02 of the General Conditions has been identified and established in Paragraph 4.02 of 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.

4.02 *Underground Facilities*

A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

4.03 *Hazardous Environmental Condition*

A. The Supplementary Conditions identify any reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.

B. Copies of reports and drawings referenced in Paragraph 4.03.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.06 of the General Conditions has been identified and established in Paragraph 4.06 of 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.

4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in

the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.06 of the General Conditions.

- 4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.
- 4.06 A. Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of contract documents (other than portions thereof related to price) for such other work.
- B. Paragraph 6.13.C of the General Conditions indicates that if an Owner safety program exists, it will be noted in the Supplementary Conditions.
- 4.07 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;
- B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Paragraph 4.06 of the Supplementary Conditions as containing reliable "technical data";
- E. consider the information known to Bidder; 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 Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;

- F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
 - G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
 - H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
 - I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 – PRE-BID CONFERENCE

- 5.01 A Mandatory Pre-Bid conference will be held at 10:00 a.m. local time on July 8, 2021 at the Flint Water Pollution Control Facility, 4652 Beecher Road, Flint, MI. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are required to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective. Attendance at this meeting is required to submit a bid on the project.

ARTICLE 6 – SITE AND OTHER AREAS

- 6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid bond (on the form attached) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.
- 8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.
- 8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven 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 substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items.

Whenever it is specified or described in the Bidding Documents that a substitute or “or-equal” item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS AND OTHERS

12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute,

[in which case apparent Successful Bidder shall submit an acceptable 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.]

12.02 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, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity 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 revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 13 – PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from Engineer.

13.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each [section, Bid item, alternative, adjustment unit price item, and unit price item] listed therein. In the case of optional alternatives the words “No Bid,” “No Change,” or “Not Applicable” may be entered.

- 13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.06 A Bid by an individual shall show the Bidder's name and official address.
- 13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.08 All names shall be printed in ink below the signatures.
- 13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID; COMPARISON OF BIDS

14.01 Lump Sum & Alternates

- A. Bidders shall submit a Bid on a lump sum basis for the base Bid and include a separate price for each alternate described in the Bidding Documents as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate. Bidders are encouraged to fill in any Alternates which are listed as “Voluntary,” but need not do so. In the comparison of Bids, alternates may be applied in any order with all or none of them selected as determined solely by the OWNER.

14.02 Allowances

- A. For cash allowances the Bid price shall 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 11.02.B of the General Conditions.

ARTICLE 15 – SUBMITTAL OF BID

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

- 15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked 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 shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation “**BID ENCLOSED.**” A mailed Bid shall be addressed to the entity provided in the Bid Advertisement.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.
- 16.02 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, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

- 17.01 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 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 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 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.
- 19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.
- 19.06 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.

ARTICLE 20 – CONTRACT SECURITY AND INSURANCE

20.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

ARTICLE 21 – SIGNING OF AGREEMENT

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

ARTICLE 22 – SALES AND USE TAXES

22.01 The Contractor is responsible for payment of all State of Michigan sales and use tax on this project. Said taxes shall not be included in the Bid. Refer to Paragraph 6.10 of the Supplementary Conditions for additional information.

ARTICLE 23 – RETAINAGE

23.01 Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Agreement.

SECTION 00300

BID FORM

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

City of Flint, Michigan

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation, those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 120 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

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

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

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in SC-

4.02 as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in SC-4.06 as containing reliable "technical data."

- E. Bidder has considered the information known to Bidder; 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 Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
- F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. 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.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- 1. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid 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.

ARTICLE 5 – BASIS OF BID

5.01 The following unit prices are given based on the structural work pertaining to the concrete tanks on site as given on the Drawings with all of the remaining work of this Contract to be included under the Lump Sum Work Total. Final unit price amounts will be determined as given in Paragraph 11.03 of the General Conditions. All specified cash allowances are included in the prices set forth below and have been computed in accordance with Paragraph 11.02 of the General Conditions:

| Type | Description | Quantity | Unit | Unit Price | Total Price |
|------|--------------------------------------|----------|------|--------------|--------------|
| 1 | Non-Structural Crack Repair Type 1 | 1470 | LF | | |
| 2 | Structural Crack Repair Type 2 | 80 | LF | | |
| 3 | Spall Repair Type 3 | 205 | SF | | |
| 4 | Pressure Relief Valve Repair Type 4 | 47 | EA | | |
| 5 | Wall Repair Type 5 | 90 | SF | | |
| 6 | Grout Topping Replacement Type 6 | 875 | SF | | |
| 7 | Owner Contingency Allowance | 1 | LS | \$300,000.00 | \$300,000.00 |
| 8 | All Other Items, Lump Sum Work Total | 1 | LS | | |

Total Base Bid price for all above Work:

(\$ _____)

Use Words

Use Figures

ALTERNATE 1: Provide stainless steel in lieu of painted carbon steel for all the fabricated steel components on the project. Amount to be Added to Base Bid if this Alternate is accepted:

_____ (\$ _____)

Use Words

Use Figures

ALTERNATE 2: Coat the exposed portion of the walls of all eight clarifiers as detailed on the plans and specifications. Amount to be Added to Base Bid if this Alternate is accepted:

_____ (\$ _____)

Use Words

Use Figures

ALTERNATE 3: Coat the exposed portion of the floor of all eight clarifiers as detailed on the plans and specifications. Amount to be Added to Base Bid if this Alternate is accepted:

_____ (\$ _____)

Use Words

Use Figures

ARTICLE 6 – TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

- 7.01 The following documents are submitted with and made a condition of this Bid:
 - A. Required Bid security in the form of _____;

ARTICLE 8 – DEFINED TERMS

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

ARTICLE 9 – BID SUBMITTAL

9.01 This Bid is submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____
(Individual's signature)

Doing business as: _____

A Partnership

Partnership Name: _____

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

Name (typed or printed): _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

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

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

Name (typed or printed): _____

Title: _____
(CORPORATE SEAL)

Attest _____

Date of Qualification to do business in [State where Project is located] is
____/____/____.

A Joint Venture

Name of Joint Venture: _____

First Joint Venturer Name: _____ (SEAL)

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

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

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

Name (typed or printed): _____

Title: _____

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

Bidder's Business Address _____

Phone No. _____ Fax No. _____

E-mail _____

SUBMITTED on _____, 20____.

BID BOND

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

BIDDER *(Name and Address)*:

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

OWNER *(Name and Address)*:

BID

Bid Due Date:

Description *(Project Name and Include Location)*:

BOND

Bond Number:

Date *(Not earlier than Bid due date)*:

Penal sum _____ \$ _____
(Words) (Figures)

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

BIDDER _____ (Seal) **SURETY** _____ (Seal)
Bidder's Name and Corporate Seal Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.

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

**SUGGESTED FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)**

THIS AGREEMENT is by and between _____ City of Flint _____ (“Owner”) and
_____ (“Contractor”).

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: *Work shall include the installation of steel circumferential influent and effluent troughs, weirs, scum baffles and algae covers on the existing eight (8) secondary clarifiers and concrete rehabilitation of the existing tanks.*

ARTICLE 2 – THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows: Secondary Clarifier Project.

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Hubbell, Roth & Clark, Inc. (Engineer), which is to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

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 *Days to Achieve Substantial Completion and Final Payment*

A. The Work will be substantially completed within 400 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 420 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 loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. 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), Contractor shall pay Owner \$1,500.00 for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$1,500.00 for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A below:

- A. For all Work other than Unit Price Work, a lump sum of: \$ _____

All specific cash allowances are included in the above price in accordance with Paragraph 11.02 of the General Conditions.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 14 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 account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 7th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of 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 in the General Requirements.

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 Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.
 - a. The provisions set forth in Michigan Public Acts of 1980, Act No. 524, shall be adhered to by OWNER and CONTRACTOR for retainage. A copy of the Act is included in Section 00702, Act. No. 524, Michigan P.A. 1980.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the passbook savings rate.

ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:
 - A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."
 - E. Contractor has considered the information known to Contractor; 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 Site-related reports and drawings

identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that 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 Documents.
- G. 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.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 Contents

- A. The Contract Documents consist of the following:
 - 1. This Agreement.
 - 2. Performance bond.
 - 3. Payment bond.
 - 4. Other bonds _____.
 - 5. General Conditions.
 - 6. Supplementary Conditions.
 - 7. Specifications as listed in the table of contents of the Project Manual.
 - 8. Drawings as listed on attached sheet index.
 - 9. Addenda (numbers 1, inclusive).

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

- a. Contractor's Bid.
- b. Documentation submitted by Contractor prior to Notice of Award.

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

- a. Notice to Proceed.
- b. Work Change Directives.
- c. Change Orders.

B. The documents listed in Paragraph 9.01.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 9.

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

ARTICLE 10 – MISCELLANEOUS

10.01 Terms

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

10.02 Assignment of Contract

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by 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 Documents.

10.03 Successors and Assigns

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

10.04 *Severability*

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

10.05 *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 10.05:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of 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.

10.06 *Other Provisions*

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

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

OWNER:

CONTRACTOR

City of Flint _____

By: _____

By: _____

Title: _____

Title: _____

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

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

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

Agent for service of process:

Notice of Award

Date: _____

Project: City of Flint WPCF

Owner: City of Flint

Owner's Contract No.: n/a

Contract:

Engineer's Project No.:

Bidder

Bidder's Address

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for construction of Ultraviolet Disinfection Improvements.

The Contract Price of your Contract is _____ This reflects the base bid total.

10 sets of the Drawings will be delivered separately or otherwise made available to you.

You must comply with the following conditions precedent within [30] days of the date you receive this Notice of Award.

1. Deliver to the Owner [6] fully executed bonds and insurance as required in the Contract.

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within thirty days after you comply with the above conditions and funding has been secured, Owner will return to you one fully executed counterpart of the Contract Documents.

By: _____
Authorized Signature

Title

Copy to Engineer

Notice to Proceed

Date: _____

Project: Flint WPCF

Owner: City of Flint

Owner's Contract No.:

Contract:

Engineer's Project No.

Contractor:

Contractor's Address:

You are notified that the Contract Times under the above Contract will commence to run on _____ . On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the Agreement, the date of Substantial Completion is _____ and the date of readiness for final payment is _____).

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Owner

Given by:

Authorized Signature

Title

Date

Copy to Engineer

PERFORMANCE BOND

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

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

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:
Amount:
Description (*Name and Location*):

BOND

Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
 - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
 - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
 1. Surety in accordance with the terms of the Contract; or
 2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
 - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
 2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

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

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

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

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

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

11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

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

FOR INFORMATION ONLY – *(Name, Address and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other party)*:

PAYMENT BOND

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

CONTRACTOR (*Name and Address*):

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

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:
Amount:
Description (*Name and Location*):

BOND

Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL

SURETY

(Seal)
Contractor's Name and Corporate Seal

(Seal)
Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

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

the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

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

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

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

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

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

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms “labor, materials or equipment” that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and 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.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

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

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)

Surety Agency or Broker:

Owner’s Representative (*Engineer or other*):

Progress Estimate

Contractor's Application

| For (contract): | | | | Application Number: | | | | |
|---------------------------|-------------|-----------------|---------------------------------|---------------------|--|--|---------|---------------------------|
| Application Period: | | | | Application Date: | | | | |
| A | | B | Work Completed | | E | F | | G |
| Item | | Scheduled Value | C | D | Materials Presently Stored (not in C or D) | Total Completed and Stored to Date (C + D + E) | % (E) B | Balance to Finish (B - F) |
| Specification Section No. | Description | | From Previous Application (C+D) | This Period | | | | |
| | | | | | | | | |
| Totals | | | | | | | | |

Certificate of Substantial Completion

Project:

Owner:

Owner's Contract No.:

Contract:

Engineer's Project No.:

This [tentative] [definitive] Certificate of Substantial Completion applies to:

- All Work under the Contract Documents: 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 Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

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

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:

- Amended Responsibilities Not Amended

Owner's Amended Responsibilities:

Contractor's Amended Responsibilities:

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

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

Executed by Engineer

Date

Accepted by Contractor

Date

Accepted by Owner

Date

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer 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, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer’s written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given 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 under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *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.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *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 for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *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 at the Site.
44. *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 thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, 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 Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *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, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work

Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the 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 Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. 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 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean 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, shall mean 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, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

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

2.04 Starting the Work

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

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), 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 Documents;
 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.

2.06 *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 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, 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 instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial 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 for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall 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 component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one 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. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, 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 Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*
 1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, 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) any standard, specification, manual, or code, or (c) 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 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
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 Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); 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 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
 3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier 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 editions; or

2. 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.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

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

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor 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. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- 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 the Work is to be performed 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.

4.02 *Subsurface and Physical Conditions*

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

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “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; or
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.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
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 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments*:

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition 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 meet any one or more of the categories described in Paragraph 4.03.A; and
 - 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 Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final 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
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or 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) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

- A. *Shown or Indicated*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, 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 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *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.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “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; or
 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 any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) 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 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. 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, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

- F. 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. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. 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 or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. 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 a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as

Acceptable Reinsuring Companies” as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

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

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor’s obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor’s liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor’s Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor’s performance of the Work and Contractor’s other obligations under the Contract Documents, whether it is to be performed 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:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
 - C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
 - D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
 - E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their 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 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 Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (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. None of the above waivers shall extend to the rights that any party making such waiver may have

to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

- B. 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:
 - 1. loss 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 perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably

request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, 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. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *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. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *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 at all times maintain good discipline and order at the Site.
- B. 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. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *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.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall 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 shall 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.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 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 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 - 1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

- a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it 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; and
 - 3) it has a proven record of performance and availability of responsive service.
- b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

- b) 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
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
 - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. 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.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract

Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (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 any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *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 a particular 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 shall be disclosed by Owner 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.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. 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 opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *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. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *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.

6.11 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. 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 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 by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall 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 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 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 property to stresses or pressures that will endanger it.

6.12 *Record Documents*

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

6.13 *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. 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, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. 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. Contractor shall notify

owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. 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.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.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 (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).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of 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.

6.16 *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 threatened 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 thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.
1. *Shop Drawings:*
 - a. Submit number of copies specified in the General Requirements.
 - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.
 2. *Samples:*
 - a. Submit number of Samples specified in the Specifications.
 - b. 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 6.17.D.
- B. 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. *Submittal Procedures:*
1. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. 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, conform to the information given in 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 (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.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's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

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.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *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 and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, modification, or improper 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.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
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 or the issuance of a notice of acceptability by Engineer;
 6. any inspection, test, or approval by others; or
 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. 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 performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the 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 6.20.A shall not be limited in any way by any limitation on the amount or type of damages,

compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. 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. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, 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.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

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

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

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

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *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.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *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 Documents.

8.12 *Compliance with Safety Program*

- 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 pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *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 Documents.

9.02 *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 9.09. 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.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which 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. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. 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, subject to the provisions of Paragraph 10.05.

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

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents 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 shall 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 Paragraph 14.07.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 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *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 by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *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 as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the 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; and
3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *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.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
 1. deny the Claim in whole or in part;
 2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 Cost of the Work

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall 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. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall 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 shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall 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, who 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 shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including 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, and hand tools not owned by the workers, 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.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the 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 property insurance established in accordance with Paragraph 5.06.D), 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 shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall 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 telegrams, long distance telephone calls, telephone 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 Contractor is required by the Contract Documents to purchase and maintain.

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

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety 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 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. 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.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 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:*

1. Contractor agrees that:
 - a. 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
 - b. 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 on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a 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 on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *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. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- 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. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for 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, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall 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 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five 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 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, 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 the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or 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) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will 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 therewith as applicable.

13.03 Tests and Inspections

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- 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 and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. 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.

- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, 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, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay 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 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 Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. 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, or both, 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, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *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, 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 shall 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.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay 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 correction or removal (including but not limited to all costs of repair or replacement of work of others).

- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *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 terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
1. repair such defective land or areas; or
 2. correct such defective Work; or
 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If 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. 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 correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. 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.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, 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.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay 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) 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 pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *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 rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, 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, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, 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 (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) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. 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 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *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. 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 shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, 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 9.07, 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 Documents; 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, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, 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 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;

- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. 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;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action 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, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *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 (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

- 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 tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. 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 tentative list.

14.05 *Partial Utilization*

- 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. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and 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 14.04.A through D for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and 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 14.04 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 5.10 regarding property insurance.

14.06 *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 is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *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, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) 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.

B. Engineer's Review of Application and Acceptance:

1. 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 Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. 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. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 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 notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 Owner May Terminate for Cause

- A. The occurrence of any one or more of the following events will 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 established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's repeated disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
 1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. 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
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.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 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) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed 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.

- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. 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. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven 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;
 - 3. 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) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days

to pay Contractor any sum finally determined to be due, then Contractor may, upon seven 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 15.03.

- 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, seven 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 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 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 16 – DISPUTE RESOLUTION

16.01 Methods and Procedures

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 2. agrees with the other party to submit the Claim to another dispute resolution process; or
 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

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

17.03 *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 Documents. 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.

17.04 *Survival of Obligations*

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

17.05 *Controlling Law*

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

17.06 *Headings*

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

Act No. 524

Public Acts of 1980

Approved by Governor

January 29, 1981

STATE OF MICHIGAN
80th LEGISLATURE
REGULAR SEASON OF 1980

Introduced by Rep. Ryan

ENROLLED HOUSE BILL NO. 5541

AN ACT to provide for the terms of certain construction contracts with certain public agencies; to regulate the payment and retainage of payments on construction contracts with certain public agencies; and to provide for the resolution of certain disputes.

The People of the State of Michigan enact:

Sec. 1. As used in this act:

(a) "Agent" means the person or persons agreed to or selected by the contractor and the public agency pursuant to section 4(2).

(b) "Architect or professional engineer" means an architect or professional engineer licensed under Act No. 299 of the Public Acts of 1980, being sections 339.101 to 339.2601 of the Michigan Compiled Laws, and designated by a public agency in a construction contract to recommend progress payments.

(c) "Construction contract" or "contract" means a written agreement between a contractor and a public agency for the construction, alteration, demolition, or repair of a facility, other than a contract having a dollar value less than \$30,000.00 or a contract that provides for 3 or fewer payments.

(d) "Contract documents" means the construction contract; instructions to bidders; proposal; conditions of the contract; performance bond; labor and material bond; drawings; specifications; all addenda issued before execution of the construction contract and all modifications issued subsequently.

(e) "Contractor" means an individual, sole proprietorship, partnership, corporation, or joint venture, that is a party to a construction contract with a public agency.

(f) "Facility" means a building, utility, road, street, boulevard, parkway, bridge, ditch, drain, levee, dike, sewer, park, playground, or other structure or work that is paid for with public funds or a special assessment.

(g) "Progress payment" means a payment by a public agency to a contractor for work in place under the terms of a construction contract.

(h) "Public agency" means this state, or a county, city township, village, assessment district, or other political subdivision, corporation, commission, agency, or authority created by law. However, public agency does not include the state transportation department, a school district, junior or community college, the Michigan state housing development authority created in Act No. 346 of the Public Acts of 1966, as amended, being sections 125.1401 to 125.1496 of the Michigan Compiled Laws, and a municipal electric utility or agency.

“Assessment district” means the real property within a district area upon which special assessments are levied or imposed or the construction, reconstruction, betterment, replacement, or repair of a facility to be paid for by funds derived from those special assessments imposed or levied on the benefited real property.

(i) “Retainage” or “retained funds” means the amount withheld from a progress payment to a contractor pursuant to Section 3.

Sec. 2. (1) The construction contract shall designate a person representing the contractor who will submit written requests for progress payments, and a person representing the public agency to whom requests for progress payments are to be submitted. The written requests for progress payments shall be submitted to the designated person in a manner and at such time as provided in the construction contract.

(2) The processing of progress payments by the public agency may be deferred by the public agency until work having a prior sequence, as provided in the contract documents, is in place and is approved.

(3) Each progress payment requested, including reasonable interest if requested under subsection (4), shall be paid within 1 of the following time periods, whichever is later:

(a) Thirty days after the architect or professional engineer has certified to the public agency that work is in place in the portion of the facility covered by the applicable request for payment in accordance with the contract documents.

(b) Fifteen days after the public agency has received the funds with which to make the progress payment from a department or agency of the federal or state government, if any funds are to come from either of those sources.

(4) Upon failure of a public agency to make a timely progress payment pursuant to this section, the person designated to submit requests for progress payments may include reasonable interest on amounts past due in the next request for payment.

Sec. 3. (1) To assure proper performance of a construction contract by the contractor, a public agency may retain a portion of each progress payment otherwise due as provided in this section.

(2) The retainage shall be limited to the following:

(a) Not more than 10% of the dollar value of all work in place until work is 50% in place.

(b) After the work is 50% in place, additional retainage shall not be withheld unless the public agency determines that the contractor is not making satisfactory progress, or for other specific cause relating to the contractor’s performance under the contract. If the public agency so determines, the public agency may retain not more than 10% of the dollar value of work more than 50% in place.

(3) The retained funds shall not exceed the pro rata share of the public agency’s matching requirement under the construction contract and shall not be commingled with other funds of the public agency and shall be deposited in an interest bearing account in a regulated financial institution in this state wherein all such retained funds are kept by the public agency which shall account for both retainage and interest on each construction contract separately. A public agency is not required to deposit retained funds in an interest bearing account if the retained funds are to be provided under a state or federal grant and the retained funds have not been paid to the public agency.

(4) Except as provided in Section 4(7) and (8), retainage and interest earned on retainage shall be released to a contractor together with the final progress payment.

(5) At any time after 94% of work under the contract is in place and at the request of the original contractor, the public agency shall release the retainage plus interest to the original contractor only if the original contractor provides to the public agency an irrevocable letter of credit in the amount of the retainage plus interest, issued by a bank authorized to do business in this state, containing terms mutually acceptable to the contractor and the public agency.

Sec 4. (1) The construction contract shall contain an agreement to submit those matters described in subsection (3) to the decision of an agent at the option of the public agency.

(2) If a dispute regarding a matter described in subsection (3) arises, the contractor and the public agency shall designate an agent who has background, training, and experience in the construction of facilities similar to that which is the subject of the contract, as follows:

(a) In an agreement reached within 10 days after a dispute arises.

(b) If an agreement cannot be reached within 10 days after a dispute arises, the public agency shall designate an agent who has background, training, and experience in the construction of facilities similar to that which is the subject of the contract and who is not an employee of the agency.

(3) The public agency may request dispute resolution by the agent regarding the following:

(a) At any time during the term of the contract, to determine whether there has been a delay for reasons that were within the control of the contractor, and the period of time that delay has been caused, continued, or aggravated by actions of the contractor.

(b) At any time after 94% of work under the contract is in place, whether there has been an unacceptable delay by the contractor in performance of the remaining 6% of work under the contract. The agent shall consider the terms of the contract and the procedures normally followed in the industry and shall determine whether the delay was for failure to follow reasonable and prudent practices in the industry for completion of the project.

(4) This dispute resolution process shall be used only for the purpose of determining the rights of the parties to retained funds and interest earned on retained funds and is not intended to alter, abrogate, or limit any rights with respect to remedies that are available to enforce or compel performance of the terms of the contract by either party.

(5) The agent may request and shall receive all pertinent information from the parties and shall provide an opportunity for an informal meeting to receive comments, documents, and other relevant information in order to resolve the dispute. The agent shall determine the time, place, and procedure for the informal meeting. A written decision and reasons for the decision shall be given to the parties within 14 days after the meeting.

(6) The decision of the agent shall be final and binding upon all parties. Upon application of either party, the decision of the agent may be vacated by order of the circuit court only upon a finding by the court that the decision was procured by fraud, or other illegal means.

(7) If the dispute resolution results in a decision:

(a) That there has been a delay as described in subsection (3)(a), all interest earned on retained funds during the period of delay shall become the property of the public agency.

(b) That there has been unacceptable delay as described in subsection (3)(b), the public agency may contract with a subsequent contractor to complete the remaining 6% of work under the contract, and interest earned on retained funds shall become the property of the public agency. A subsequent contractor under this subdivision shall be paid by the public agency from the following sources until each source is depleted, in the order listed below:

(i) The dollar value of the original contract, less the dollar value of funds already paid to the original contractor and the dollar value of work in place for which the original contractor has not received payment.

(ii) Retainage from the original contractor, or funds made available under a letter of credit provided under section 3(5).

(iii) Interest earned on retainage from the original contractor, or funds made available under a letter of credit provided under section 3(5).

(8) If the public agency contracts with a subsequent contractor as provided in subsection (7)(b), the final progress payment shall be payable to the original contractor the time period specified in section 2(3). The amount of the final progress payment to the original contractor shall not include interest earned on retained funds. The public agency may deduct from the final progress payment all expenses of contracting with the subsequent contractor. This act shall not impair the right of the public agency to bring an action or to otherwise enforce a performance bond to complete work under a construction contract.

Sec. 5. (1) Except as provided in subsection (2), this act shall apply only to a construction contract entered into after the effective date of this act.

(2) For a construction contract entered into before the effective date of this date, the provisions of this act may be implemented by a public agency, through a contract amendment, upon the written request of the contractor, with such consideration as the public agency considers adequate.

Sec. 6. This act shall take effect January 1, 1983.

REQUIRED STANDARD CONTRACT LANGUAGE: CLEAN WATER STATE REVOLVING FUND AND DRINKING WATER REVOLVING FUND

- **Davis-Bacon/Prevailing Federal Wages, Including Labor Standards Provisions**
- **Disadvantaged Business Enterprise (DBE) Requirements***
- **Debarment/Suspension Certification***

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

Davis-Bacon/Prevailing Federal Wage Rates

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. A copy of the Federal Labor Standards Provisions is included and is hereby a part of this contract.

"General Decision Number: MI20210083 05/14/2021

Superseded General Decision Number: MI20200083

State: Michigan

Construction Type: Building

County: Genesee County in Michigan.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.95 for calendar year 2021 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, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.95 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 calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

| Modification Number | Publication Date |
|---------------------|------------------|
| 0 | 01/01/2021 |
| 1 | 04/02/2021 |
| 2 | 05/14/2021 |

ASBE0047-002 07/01/2020

| | Rates | Fringes |
|--|----------|---------|
| ASBESTOS WORKER/HEAT & FROST INSULATOR..... | \$ 32.52 | 17.88 |

 BOIL0169-001 03/01/2018

| | Rates | Fringes |
|------------------|----------|---------|
| BOILERMAKER..... | \$ 38.65 | 26.22 |

 BRMI0009-014 08/01/2020

| | Rates | Fringes |
|--------------------|----------|---------|
| BRICKLAYER..... | \$ 33.23 | 23.08 |
| TILE FINISHER..... | \$ 29.93 | 18.02 |
| TILE SETTER..... | \$ 29.93 | 18.02 |

FOOTNOTE:

Paid Holiday: Fourth of July, if the worker was employed by the contractor in any period of seven working days before said holiday within the current calendar year.

 CARP0706-001 06/01/2020

| | Rates | Fringes |
|---|----------|---------|
| CARPENTER, Includes Acoustical Ceiling Installation, Drywall Hanging, Form Work, and Metal Stud Installation..... | \$ 28.21 | 21.84 |

 ELEC0948-001 11/30/2020

| | Rates | Fringes |
|----------------------------------|----------|-------------|
| ELECTRICIAN | | |
| Excludes Low Voltage Wiring..... | \$ 39.17 | 23.51 |
| Low Voltage Wiring..... | \$ 30.34 | 8.20+31.50% |

 ENGI0324-011 06/01/2020

| | Rates | Fringes |
|---------------------------|----------|---------|
| OPERATOR: Power Equipment | | |
| GROUP 1..... | \$ 40.38 | 24.85 |
| GROUP 2..... | \$ 37.08 | 24.85 |
| GROUP 3..... | \$ 33.63 | 24.85 |
| GROUP 4..... | \$ 32.72 | 24.85 |
| GROUP 5..... | \$ 32.72 | 24.85 |

| | | |
|--------------|----------|-------|
| GROUP 6..... | \$ 26.86 | 24.85 |
| GROUP 7..... | \$ 24.38 | 24.85 |

FOOTNOTES:

Crane operator with main boom and jib 300' or longer: \$1.50 per hour above the group 1 rate. Crane operator with main boom and jib 400' or longer: \$3.00 per hour above the group 1 rate.

PAID HOLIDAYS: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Crane operator with main boom and jib 400', 300', or 220' or longer.

GROUP 2: Crane operator with main boom and jib 140' or longer, tower crane, gantry crane, whirley derrick

GROUP 3: Backhoe/Excavator/Trackhoe; Bulldozer; Concrete Pump; Crane; Grader/Blade; Highlift; Hoist; Loader; Roller; Scraper; Stiff Leg Derrick; Tractor; Trencher

GROUP 4: Bobcat/Skid Loader; Broom/Sweeper; Fork Truck (over 20' lift)

GROUP 5: Boom Truck (non-swinging)

GROUP 6: Fork Truck (20' lift and under for masonry work)

GROUP 7: Oiler

IRON0025-019 06/01/2019

| | Rates | Fringes |
|------------------|----------|---------|
| IRONWORKER | | |
| REINFORCING..... | \$ 30.98 | 27.99 |
| STRUCTURAL..... | \$ 36.77 | 29.03 |

LAB00334-005 06/01/2019

| | Rates | Fringes |
|------------------------------------|----------|---------|
| LABORER: Landscape & Irrigation | | |
| GROUP 1..... | \$ 20.75 | 7.10 |

| | | |
|--|----------|-------|
| PIPEFITTER (Includes HVAC Pipe Installation; Excludes HVAC System Installation)..... | \$ 39.81 | 20.95 |
| PLUMBER, Excludes HVAC Pipe Installation..... | \$ 39.81 | 20.95 |

ROOF0149-005 06/01/2020

| | Rates | Fringes |
|-------------|----------|---------|
| ROOFER..... | \$ 29.58 | 23.25 |

* SFMI0669-001 04/01/2021

| | Rates | Fringes |
|--|----------|---------|
| SPRINKLER FITTER (Fire Sprinklers)..... | \$ 36.97 | 24.12 |

SHEE0007-008 05/01/2018

| | Rates | Fringes |
|---|----------|---------|
| SHEET METAL WORKER, Includes HVAC Duct and Unit Installation..... | \$ 30.64 | 22.76 |

SUMI2011-008 02/01/2011

| | Rates | Fringes |
|--|----------|---------|
| IRONWORKER, ORNAMENTAL..... | \$ 18.48 | 7.93 |
| TRUCK DRIVER: Tractor Haul Truck..... | \$ 13.57 | 1.18 |

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 www.dol.gov/whd/govcontracts.

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) (ii)).

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 Regional Office for the area in which the survey was conducted because those Regional Offices have 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"

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

§ 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 <http://www.dol.gov/whd/forms/wh347.pdf> 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 (write the name of the agency) 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 may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) *Apprentices and trainees--(i) Apprentices.* Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its

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

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

(iii) *Equal employment opportunity*. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) *Compliance with Copeland Act requirements*. 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 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and 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 (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

Disadvantaged Business Enterprises (DBE)

Prime contractors bidding on this project must follow, document, and maintain documentation of their Good Faith Efforts, 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 time-frames 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 (Attachment 1), 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 Revolving Loan 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.

Debarment Certification

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 (Attachment 2).

Attachment 1

**Disadvantaged Business Enterprise (DBE) Utilization
GOOD FAITH EFFORTS WORKSHEET**

**Michigan Department of Environmental Quality
Office of Drinking Water and Municipal Assistance– Revolving Loan Section
Disadvantaged Business Enterprise (DBE) Utilization
State Revolving Fund/Drinking Water Revolving Fund
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 DBE.

| Company Name | Type of Contact | Date of Contact | Price Quote Received | Accepted/ Rejected | Please Explain if Rejected |
|--------------|-----------------|-----------------|----------------------|--|----------------------------|
| | | | | <input type="checkbox"/> A <input type="checkbox"/> R | |
| | | | | <input type="checkbox"/> A <input type="checkbox"/> R | |
| | | | | <input type="checkbox"/> A <input type="checkbox"/> R | |
| | | | | <input type="checkbox"/> A <input type="checkbox"/> R | |
| | | | | <input type="checkbox"/> A <input type="checkbox"/> R | |
| | | | | <input type="checkbox"/> A <input type="checkbox"/> R | |

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.

Rev.3-2015

Rick Snyder, Governor



Dan Wyant, Director

**Michigan Department of Environmental Quality
Office of Drinking Water and Municipal Assistance– Revolving Loan Section
Disadvantaged Business Enterprise (DBE) Utilization
State Revolving Fund/Drinking Water Revolving Fund
GOOD FAITH EFFORTS WORKSHEET**

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 e-mail, letter, or fax for each area of work to be subcontracted out. Copies of the solicitation letters/e-mails 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.mitadb.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 No. 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 e-mails, faxes, or letters.
 - Copies of announcements/postings in newspapers, trade publications, or minority media that target DBE firms.

Rev. 3-2015

Attachment 2

***Certification Regarding
Debarment, Suspension, and Other Responsibility Matters***

**Certification Regarding
Debarment, Suspension, and Other Responsibility Matters**

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.

Attachment 3

***Frequently Asked Questions About
Disadvantaged Business Enterprise (DBE) Solicitation***

Disadvantaged Business Enterprise (DBE) Requirements Frequently Asked Questions Regarding Contractor Compliance

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

A: This form captures efforts by the prime contractor to solicit DBEs for each area of work type that will be subcontracted out. A separate Good Faith Efforts Worksheet must be provided by the prime contractor for each area of work type to be subcontracted out. There are specific instructions that accompany this form 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 for certification under MDOT can be found at <http://mdotjboss.state.mi.us/UCP/LearnHowServlet>.

Applications for certification under EPA can be found on EPA's Small Business Programs website at http://www.epa.gov/osbp/dbe_firm.htm under Certification Forms.

Q: If a bidder follows the MDOT DBE requirements, will the bidder be in compliance with the SRF/DWRF DBE requirements?

A: No. Federally funded highway projects utilize DBE goals, which require that a certain percentage of work be performed by DBE subcontractors. For SRF/DWRF 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/DWRF.** However, if the SRF/DWRF project is part of a joint project with MDOT, the project can be excluded from SRF/DWRF DBE requirements (i.e., the Good Faith Efforts Worksheet is not required) as it would be difficult to comply with both programs' requirements.

Q: Must the Good Faith Efforts Worksheet and supporting documentation be turned in with the bid proposals?

A: Yes. This is a requirement to document that the contractor has complied with the DBE requirements and the Good Faith Efforts. 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 meetings. 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: Does EPA form 6100-2 need to be provided at the pre-bid meeting?

A: Yes. The form must be made available at the pre-bid meeting.

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

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

Q: How much time will compliance with the Good Faith Efforts 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: The Michigan Department of Transportation has a directory of all Michigan certified entities located at <http://mdotjboss.state.mi.us/UCP/>. Additionally, the federal System for Award Management (SAM) is another place to search and can be found at www.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: In the perfect world, the Good Faith Efforts Worksheet is required to be turned in with the proposal. 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 a determination/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: 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. Good Faith Efforts 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.

American Iron and Steel Contract Language

The Contractor acknowledges to and for the benefit of the *City of Flint* ("Purchaser") and the Michigan Department of Environmental Quality (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the State Revolving Fund and/or the Drinking Water Revolving Fund and such law contains provisions commonly known as "American Iron and Steel (AIS)," that requires all iron and steel products used in the project be produced in the United States ("AIS Requirements") including iron and steel provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the AIS Requirements, (b) all iron and steel used in the project will be and/or have been produced in the United States in a manner that complies with the AIS Requirements, unless a waiver of the requirements is approved or the State made the determination in writing that the AIS Requirements do not apply to the project, 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 AIS requirements, as may be requested by the Purchaser. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

SECTION 00800

SUPPLEMENTARY CONDITIONS

Supplementary Conditions

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2007 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the 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 thereto.

SC-2.02 *Copies of Documents*

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

- A. Owner shall furnish to Contractor up to 5 printed or hard copies of the Drawings and Project Manual and one set in electronic format (pdf). Additional copies will be furnished upon request at the cost of reproduction.

SC-5.04 *Contractor's Liability Insurance*

SC-5.04 Add the following new paragraph immediately after Paragraph 5.04.B:

- C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:
 - 1. Workers' Compensation, and related coverages under Paragraphs 5.04.A.1 and A.2 of the General Conditions:
 - a. State: Statutory
 - b. Applicable Federal (e.g., Longshoreman's): Statutory
 - c. Employer's Liability: \$500,000
 - 2. Contractor's General Liability under Paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion

with respect to property under the care, custody and control of Contractor:

- a. General Aggregate \$2,000,000
- b. Products - Completed Operations Aggregate \$2,000,000
- c. Personal and Advertising Injury \$1,000,000
- d. Each Occurrence (Bodily Injury and Property Damage) \$1,000,000
- e. Property Damage liability insurance will provide Explosion, Collapse, and Under-ground coverages where applicable.
- f. Excess or Umbrella Liability
 - General Aggregate \$2,000,000
 - Each Occurrence \$2,000,000

3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:

- a. Combined Single Limit of \$1,000,000

4. The Contractual Liability coverage required by Paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:

- a. Bodily Injury:
 - Each person \$1,000,000
 - Each Accident \$1,000,000
- b. Property Damage:
 - Each Accident \$1,000,000
 - Annual Aggregate \$1,000,000

5. The policy shall include an endorsement which includes the following as additional insured's:

- a. The Owner, their counsel, members, Board members, public officials, consultants, agents and employees.

- b. The “Engineer”, Hubbell, Roth & Clark, Inc., Bloomfield Hills, Michigan, Wade Trim and Associates, Detroit, Michigan; Their owners, directors, officers, consultants, agents and employees.

SC-5.06 *Property Insurance*

SC-5.06.A. Delete Paragraph 5.06.A in its entirety and insert the following in its place:

- A. Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof. Contractor shall be responsible for any deductible or self-insured retention. This insurance shall:
 - 1. include the interests of Owner, Contractor, Subcontractors, Engineer and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or loss payee;
 - 2. be written on a Builder’s Risk “all-risk” policy form that shall at least include insurance for physical loss and damage to the Work, temporary buildings, falsework, and materials and equipment in transit and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by these Supplementary Conditions.
 - 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 - 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 - 5. allow for partial utilization of the Work by Owner;
 - 6. include testing and startup;
 - 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days

written notice to each other loss payee to whom a certificate of insurance has been issued; and

8. comply with the requirements of Paragraph 5.06.C of the General Conditions.

SC-6.17 *Shop Drawings and Samples*

SC-6.17 Add the following new paragraphs immediately after Paragraph 6.17.E:

- F. Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, samples, or other items requiring approval and Contractor shall reimburse Owner for Engineer's charges for such time.
- G. In the event that Contractor requests a change of a previously approved item, Contractor shall reimburse Owner for Engineer's charges for its review time unless the need for such change is beyond the control of Contractor.

SC-9.03 *Project Representative*

SC-9.03 Add the following new paragraphs immediately after Paragraph 9.03.A:

- B. The Resident Project Representative (RPR) will be Engineer's employee or agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall:
 1. *Schedules:* Review the progress schedule, schedule of Shop Drawing and Sample submittals, and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.
 2. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

3. *Liaison:*
 - a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, assist in providing information regarding the 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 proper execution of the Work.
4. *Interpretation of Contract Documents:* Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
5. *Shop Drawings and Samples:*
 - a. Record date of receipt of Samples and approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
6. *Modifications:* Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
7. *Review of Work and Rejection of Defective Work:*
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that

RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

8. *Inspections, Tests, and System Startups:*

- a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
- b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

9. *Records:*

- a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
- b. Maintain records for use in preparing Project documentation.

10. *Reports:*

- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.
- b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
- c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition.

11. *Payment Requests:* Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

12. *Certificates, Operation and Maintenance Manuals:* During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

13. *Completion:*

- a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of lists of items to be completed or corrected.
- b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied.
- c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

C. The RPR shall 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, Suppliers, or Contractor’s superintendent.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor’s work unless such advice or directions are specifically required by the Contract Documents.
5. Advise on, issue directions regarding, or assume control over 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. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

SC-12.01 *Change of Contract Price*

SC-12.01.C *Contractor's Fee.* Delete the semicolon at the end of GC 12.01.C.2.c, and add the following language:

, provided, however, that on any subcontracted work the total maximum fee to be paid by Owner under this subparagraph shall be no greater than 27 percent of the costs incurred by the Subcontractor who actually performs the work;

SC-16.01 *Methods and Procedure*

SC-16.01 Delete Paragraph 16.01.C in its entirety and insert the following in its place:

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to demand arbitration of the Claim, pursuant to Paragraph SC-16.02; or
2. agrees with the other party to submit the Claim to another dispute resolution process.

SC-16.02 Add the following new paragraph immediately after Paragraph 16.01.

SC-16.02 *Arbitration*

A. All Claims or counterclaims, disputes, or other matters in question between Owner and Contractor arising out of or relating to the Contract Documents or the breach thereof (except for Claims which have been waived by the making or acceptance of final payment as provided by Paragraph 14.09) including but not limited to those not resolved under the provisions of Paragraphs SC-16.01A and 16.01.B will be decided by arbitration in accordance with the rules of the American Arbitration

Association, subject to the conditions and limitations of this Paragraph SC-16.02. This agreement to arbitrate and any other agreement or consent to arbitrate entered into 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 arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the 30 day period specified in Paragraph SC-16.01.C, and in all other cases within a reasonable time after the Claim or counterclaim, dispute, or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such Claim or other dispute or matter in question would be barred by the applicable statute of limitations.
- C. No arbitration arising out of or relating to the Contract Documents shall 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 is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
 - 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.
- D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include: (i) a concise breakdown of the award; (ii) a written explanation of the award specifically citing the Contract Document provisions deemed applicable and relied on in making the award.
- E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Controlling Law relating to vacating or modifying an arbitral award.
- F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

| | |
|---|-------|
| Received for Contractor by: | Date |
| Received by Funding Agency (if applicable): | Date: |

Change Order

No. _____

Date of Issuance: _____ Effective Date: _____

| | | |
|-------------|-------------------------|-----------------------|
| Project: | Owner: | Owner's Contract No.: |
| Contract: | Date of Contract: | |
| Contractor: | Engineer's Project No.: | |

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

Attachments (list documents supporting change):

CHANGE IN CONTRACT PRICE:

CHANGE IN CONTRACT TIMES:

Original Contract Price:
\$ _____

Original Contract Times: Working Calendar days
Substantial completion (days or date): _____
Ready for final payment (days or date): _____

[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____
\$ _____

[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____:
Substantial completion (days): _____
Ready for final payment (days): _____

Contract Price prior to this Change Order:
\$ _____

Contract Times prior to this Change Order:
Substantial completion (days or date): _____
Ready for final payment (days or date): _____

[Increase] [Decrease] of this Change Order:
\$ _____

[Increase] [Decrease] of this Change Order:
Substantial completion (days or date): _____
Ready for final payment (days or date): _____

Contract Price incorporating this Change
\$ _____

Contract Times with all approved Change Orders:
Substantial completion (days or date): _____
Ready for final payment (days or date): _____

RECOMMENDED:
By: _____
Engineer (Authorized Signature)

ACCEPTED:
By: _____
Owner (Authorized Signature)

ACCEPTED:
By: _____
Contractor (Authorized Signature)

Date: _____

Date: _____

Date: _____

Approved by Funding Agency (if applicable):

Date: _____

Change Order

Instructions

A. GENERAL INFORMATION

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

B. COMPLETING THE CHANGE ORDER FORM

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

SECTION 01000

GENERAL SPECIFICATIONS

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1.1 WORKING SPACE

- A. The contractor shall interfere as little as possible with traffic and in all cases shall confine the work operations to the minimum space possible.
- B. Stockpiling of construction material and equipment will be permitted as necessary, but in no case shall traveled roadways, driveways, or entrances be unduly obstructed.

- C. Should storage areas be desired on private property, the Contractor may obtain such space on privately owned property at his own expense, by agreement with the property owner thereof. The Contractor shall provide the Owner with a copy of the written permission from the private property owner prior to occupying the property.
- D. The contractor shall be allowed to use space adjacent to the Sulfur Dioxide building near the chlorine contact tank for office trailer or lay down area for materials.

1.2 WORK WITHIN PUBLIC STREETS OR LAND

- A. Where the centerline of the proposed improvement is within the public street or land, the contractor shall confine his operations to within the public street or land unless easements have been acquired (See "Easements"). It shall be the contractor's responsibility to use such methods and/or materials, including sheeting, so as to prevent any portion of the excavation from encroaching on private property. This shall not preclude the contractor from obtaining the right to encroach on private land in accord with the foregoing article "Working Space." All signing and barricading shall be done in accordance with current edition of the Michigan Manual of Uniform Traffic Control Devices (M.M.U.T.C.D.) as issued by the Michigan Department of Transportation.

1.3 EASEMENTS

- A. In certain instances the owner may have acquired certain permanent easements and construction easements for the contractor's use in constructing the work. The contractor shall confine work operations to these easements except as noted under the foregoing article "Working Space."

1.4 LOCATING WORK

- A. The contractor shall accurately locate the work from reference points established by the Owner along the surface of the ground and the line of work. For sewers, "cut sheets" will be furnished by the Owner. Reference points shall be protected and preserved by the contractor.

1.5 SOIL CONDITIONS

- A. The contractor, as such and as bidder, shall make his own determination as to soil and/or rock conditions and shall complete the work in whatever material and under whatever conditions may be encountered or created, without extra cost to the owner. This shall apply whether or not borings are shown on the drawings.
- B. The owner does not guarantee that the ground encountered during construction will conform with any boring information furnished herein.
- C. The Owner and Engineer may have been involved in the design, construction observation, and/or construction of other underground projects in the area of the proposed construction. The observation field reports, soil reports, and any soil information connected with these projects are available for review by the prospective bidders.

1.6 SURVEY MONUMENTS

- A. Monuments or other recognized property boundary markers at street intersections, section corners, acreage or lot corners, and right-of-way lines shall be preserved and protected. Where such monuments or markers must be removed during construction, the Owner shall be notified and the Contractor shall make all necessary arrangements with a land surveyor registered in the State of Michigan to have these monuments or markers properly witnessed prior to disturbance or removal and later reset by the registered land surveyor at no cost to the Owner.

1.7 TRENCH BACKFILL

- A. The Contractor, as such and as bidder, shall carefully review the contract drawings and specifications and shall determine the extent of the "Special Backfill" requirements. The cost of providing for and meeting the requirements for Special Backfill shall be included in the unit price of the work as bid at no extra cost to the Owner.
- B. Special backfill shall be used at all locations and of the type called for on the drawings, and at other locations specified herein whether called for on the drawings or not.
- C. The type and method of backfilling is dependent on its locations and function and shall conform with the following requirements. The owner will supply field observation on the special backfill compaction requirements.
- D. Backfilling of trenches in the shoulder area and under private gravel drives shall be carried to within 6 inches of the existing surface as specified under Trench A or Trench B as required. The shoulder shall be defined herein as the area within ten feet of the pavement edge, or the width of the existing graveled shoulder, whichever is the lesser. The remaining depth shall be backfilled with 6 inches of compacted 21AA aggregate. Backfilling of trenches crossing gravel roads or streets shall be carried to within 8 inches of the existing surface and the remaining depth shall be backfilled with 8 inches of compacted 21AA limestone aggregate. Compaction shall be performed by a pneumatic-tired roller or a vibratory compactor until the compaction requirements as required for Trench A or Trench B and as detailed in the following paragraphs are met.
- E. The requirements as specified herein are in addition to the conditions provided for under permit granted by the Board of County Road Commissioners of the County or the Michigan Department of Transportation.
- F. Trench A
 - 1. All trenches under graveled, slag or hard surfaced roads, pavements, hard surfaced parking lots and driveways, sidewalks, curbs and where the trench edge is within 3 feet of a pavement shall be backfilled with bank run sand meeting the requirements of Granular Material, MDOT Class II. The material shall be placed by the Controlled Density Method or other effective means having the approval of the Engineer and is to be compacted to 95 percent of maximum unit weight as determined by ASTM D-1557 Modified Proctor. Trenches under pavement to be constructed in the near future, as noted or shown on the drawings, shall be backfilled with MDOT Class II Granular Material, meeting the requirements of Table 902-3 Grading Requirements for Granular Materials 1996 in the MDOT 1996 Standard Specifications for Construction.

- G. Trench B
1. Trench B shall be used where called for on the drawings and where the trench crosses slag or gravel drives, shoulders, or parking lots whether called for on the drawings or not.

- H. All trenches shall be backfilled with granular material, MDOT Class II to a point 12 inches above the pipe for diameters less than 24 inches and up to the spring line with materials meeting the requirements of the 1996 MDOT Table 902-2, Class 34R for diameters 24 inches or larger. This portion of the backfill is to be placed in layers not exceeding 6 inches in depth and shall be thoroughly compacted by mechanical tamping to not less than 95% of maximum unit weight utilizing ASTM D-1557 Modified Proctor. The remainder of the backfill shall be made with suitable excavated material (excluding blue and gray clays, peat, muck, marl or other organic materials) placed in one foot layers with each layer being thoroughly compacted by approved mechanical methods, or other effective means having the approval of the Engineer, to a density of 90% of maximum unit weight utilizing ASTM D-1557 Modified Proctor.

1.8 MAINTENANCE AND RESTORATION OF PAVEMENTS, ROAD SURFACES, STRUCTURES AND TRENCH BACKFILL

- A. Where trenches cross existing improved roadways or drives or where the trench parallels an existing improved roadway which is disturbed by the contractor's operations, the contractor shall consolidate the trench backfill and shall place a temporary gravel fill, meeting 21AA Aggregate Gradation or (County Road Specifications) at least 8" thick; and shall, during the life of the contract, maintain the same in good condition with additional gravel as settling takes place. All structures, including curbing, walks, paving, gravel, or street road surfaces, etc., that may be damaged or destroyed by the contractor's operations, shall be repaired and replaced by him at his own expense. In restoring pavement, a saw shall be used and a cut equal to at least 3/4 of the thickness of the existing pavement shall be made on each side of the part to be restored, with the exception of expansion joints that shall be saw cut the full depth of the pavement. Concrete shall be 3500 psi, using six (6) sacks of cement per cubic yard of concrete, unless otherwise required.
- B. If the pavement removed had an asphaltic concrete surface, the surface shall be removed to a distance one foot beyond the limits of the removed concrete pavement. The butt joint in asphaltic concrete removal shall be prepared by sawing through the total depth of asphaltic concrete. The surface shall be replaced with a nominal two inches of MDOT bituminous surface mixture as required by the Owner and meeting the requirements of the Michigan Department of Transportation as to materials and method of replacement at no extra cost to the Owner.
- C. Trenches shall be backfilled to the requirement of "Trench A" or "Trench B" specifications as described in this section and as specified on plans and profiles. After completion of backfill, the work area shall be restored as noted under "Final Cleanup - Grading, Topsoil, and Seeding and/or Sodding".

1.9 ROAD PERMITS

- A. The contractor shall obtain any necessary construction permits required of contractors for work within public streets, highways, roads, or alleys. The cost of construction permits,

including, but not limited to, inspection fees, application fees, and/or review fees that may be required in connection with such permits, shall be at the Contractor's expense. Construction operations shall be conducted in accordance with provisions of such permits, including tunneling of pavements where required. The cost of any required bonds shall be included in the cost of the work as bid.

1.10 ROAD DETOURS

- A. The contractor shall provide and maintain all temporary roadways as required for work operations or as required under "Road Permits" or otherwise specified or shown on the drawings at no extra cost to the Owner.

1.11 PROTECTION OF THE PUBLIC

- A. The contractor shall provide sufficient barricades, guard railings, fencing, advance construction signing, coverings or other means to protect the public from injury due to the work operations, including completed or uncompleted work, at all times until acceptance of the work by the Owner at no extra cost to the Owner.

1.12 BARRICADES AND PROTECTION

- A. The contractor shall provide and maintain in good repair, all barricades, guard railings, etc., as required for the protection of the workers, the Owner's employees and employees of Owner's agent in strict compliance with state and local requirements.
- B. At dangerous points throughout the work, the contractor shall provide and maintain guard rails, colored lights, and flags. All possible precautions shall be taken to protect the workers from injury at no extra cost to the Owner.

1.13 MAINTENANCE OF TRAFFIC

- A. During the progress of the work, the contractor shall accommodate both vehicular and pedestrian traffic as provided in these specifications and as indicated on the drawings. In the absence of specific requirements, traffic shall be maintained in accordance with the current edition of the Michigan Manual of Uniform Traffic Control Devices. Access to fire hydrants and water valves shall always be maintained. The contractor's truck and equipment operations on public streets shall be governed by County regulations, all local traffic ordinances, and regulations of the Fire and Police Department.
- B. Small street openings necessary for manholes, alignment holes, sewer connections, etc. will be permitted. Such holes shall not be open longer than necessary and shall be protected and any traffic detouring necessary shall be done to the satisfaction of the Owner. Wherever possible, small openings shall be covered with steel plates at pavement level secured in place during periods that work is not being performed at no extra cost to the Owner.
- C. Where streets are partially obstructed, the contractor shall place and maintain temporary driveways, ramps, bridges and crossings which in the opinion of the Owner are necessary to accommodate the public at no extra cost to the Owner. In the event of the contractor's failure to comply with the foregoing provisions, the Owner may, with or without notice, cause the same to be done and deduct the cost of such work from any monies due or to become due the

contractor under this contract. However, the performance of such work by the Owner, or at his insistence, shall serve in no way to release the contractor from his liability for the safety of the traveling public.

- D. The contractor shall provide flagmen, warning lights, signs, fencing and barricades necessary to direct and protect vehicular and pedestrian traffic at no extra cost to the Owner.
- E. The contractor shall inform the local fire department in advance of work operations of street obstructions and detours, so that the fire department can set up plans for servicing the area in case of an emergency. The governing police department and the owner shall be notified at least one week prior to obstructing any street.

1.14 PRESERVATION OF TREES

- A. The contractor shall protect and preserve all trees along the line of work, and will be held responsible for any damage to trees. Where necessary to preserve a tree and its main roots, the contractor shall tunnel under such tree. Where specifically called for on the drawings, the contractor shall remove trees completely, including stumps and main roots.
- B. Where tunneling is not required for trees close to the trench and root trimming is necessary, the contractor shall hand trench ahead of the machine digging and cut all roots cleanly to minimize damage to the roots.
- C. Tree branches shall be tied back to protect them from the contractor's machinery.
- D. When a tree is removed by the contractor for his convenience and with the permission of the Owner and the adjacent property owner (where required), the contractor shall furnish one three (3) inch dia. tree for every six (6) inches of diameter of the tree removed. The species shall be as directed by the Owner. All trees installed shall be guaranteed to grow for a period of one (1) year.
- E. The contractor will receive no extra compensation for preservation of trees or for their removal and replacement where called for, and the cost of all work involved shall be included in the unit price bid or at no extra cost to the owner.

1.15 REPLACEMENT OF SHRUBBERY

- A. The contractor shall protect and/or replace all shrubbery damaged or destroyed by operations under this contract at no extra cost to the owner.

1.16 SODDING

- A. Where called for in the specifications, or on the drawings, the contractor shall furnish all labor and material and place Grade A sod to the finished grade shown or to conform with existing grades and provide a smooth and uniform surface to meet existing ground surface.
- B. Sod shall be densely rooted blue grass or other approved perennial grasses, free from noxious weeds and reasonably free from other weeds. Sod shall be not less than 2 inches thick, cut in strips not less than 10 inches wide by 18 inches long. The type of grass shall match the adjacent lawn.

- C. The area to be sodded shall be made smooth and shall be covered with not less than 2 inches of approved topsoil screened to remove all debris uniformly spread over the scarified ground surface.
- D. Sod shall be moist and shall be laid in a moist earth bed. Pegs shall be used where required to hold the sod in place.
- E. Sod shall not be placed during a drought nor during the period from July 1 to August 15.
- F. Sod to be kept moist by the contractor for fourteen (14) days to insure growth.
- G. The cost of providing for and meeting the sodding requirements shall be included in the bid price or at no extra cost to the owner.

1.17 FINAL CLEANUP, GRADING, TOP SOIL AND SEEDING

- A. Upon completion of construction and before final payment is made, the contractor shall restore the working area to as clean a condition as existed before construction operations started.
- B. The Contractor shall go over the entire area and regrade and fill any areas that may have settled, including fills made from excess excavated materials and all other areas that may have been disturbed during construction operations.
- C. Where established lawn or grass areas have been disturbed by the contractor's operations, the Contractor shall provide, unless otherwise specified or called for on the drawings or in the specifications, not less than the minimum depth of approved top soil and shall grade, seed, fertilize and mulch the areas as required by the Owner and per the following Table:

| <u>Location</u> | <u>Seed Mixture</u> | <u>Amount of Seed</u> | <u>Fertilizer</u> | <u>Top Soil (min.)</u> |
|-----------------|---------------------|-----------------------|-------------------|------------------------|
| Lawn | MDOT Class A | 100 lb/Acre | 400 lb/Acre | 3" |
| Other Areas | MDOT Roadside | 35 lb/Acre | 200 lb/Acre | 2" |

- D. Fertilizing and sowing shall be done in an approved manner, and the seed shall be covered by light raking or dragging, and then rolled with a light roller. Fertilizer shall be 10-6-4 commercial type.
- E. Seeding areas are to be kept moist for fourteen (14) days to insure growth. The cost of providing for and meeting these requirements shall be incidental to the project unless otherwise provided.

1.18 EXISTING STRUCTURES AND UTILITIES

- A. Certain underground structures and utilities have been shown as an aid to the contractor, but the owner does not guarantee their location or that other underground structures or utilities may not be encountered.

1.19 PUBLIC AND PRIVATE UTILITIES

A. Utilities

1. The Contractor must provide adequate protection for water, sewer, gas, telephone, TV cable, or any other public or private utilities encountered. The Contractor will be held responsible for any damages to such utilities arising from his operation.
2. When it is apparent that construction operations may endanger the foundations of any utility conduit, or the support of any structure, the contractor shall notify the utility owner of this possibility and shall take steps as may be required to provide temporary bracing or support of conduit or structures.
3. In all cases where permits or inspection fees are required by utilities in connection with changes to or temporary support of their conduits, the contractor shall secure such permits and pay all inspection fees.
4. Where it is necessary in order to carry out the work, that a pole, electric or telephone, be moved to a new location, or moved and replaced after construction, the contractor shall arrange for the moving of such pole or poles, and the lines thereof, and shall pay any charges therefor.
5. Where it is the policy of any utility owner to make repairs to damaged conduit or other structures, the contractor shall cooperate to the fullest extent with the utility and shall see that construction operations interfere as little as possible with the utilities operations. The contractor shall pay any charges for these repairs.

B. Existing Sewer Facilities

1. Existing sewers or drains may be encountered along the line of work. In all such cases, the contractor shall perform the work in such a manner that sewer service will not be interrupted. and shall make all temporary provisions to maintain sewer service as incidental to the work as bid.
2. Unless otherwise indicated on the drawings, the contractor shall replace any disturbed sewer or drain, or relay same at a new grade and/or location to be established by the Owner such that sufficient clearance for the sewer will be provided.
3. The contractor will receive no extra compensation for replacement or relocation of sewers or drains encountered, or for relaying at a new grade where called for by the drawings unless a separate bid item has been included in the proposal.

C. Existing Water Facilities

1. Where existing water mains are encountered in the work, they shall be maintained in operation. If necessary, they shall be re-laid using ductile iron pipe of the type and with joints as specified within the current water main specifications of the governmental agency controlling said utility.
2. The contractor will receive no extra compensation for the relaying and/or lowering or raising of water mains or water service leads, except where a separate bid item has been included in the proposal.

D. Existing Gas Facilities

1. Where existing gas mains and services are encountered, the contractor shall arrange with the gas company for any necessary relaying, and shall pay for the cost of such work unless otherwise provided.

1.20 PUMPING, BAILING AND DRAINING

- A. The contractor shall provide and maintain adequate pumping and drainage facilities for removal and disposal of water from trenches or other excavations.
- B. Where the work is in ground containing an excessive amount of water, the contractor shall provide, install, maintain, and operate suitable deep wells or well points, connecting manifolds and reliable pumping equipment to operate same to insure proper construction of the work. Alternate dewatering methods may be implemented if approved by the Owner.
- C. Drainage or discharge lines shall be connected to adjacent public storm water drains or extended to nearby water courses wherever possible. In any event, all pumping and drainage shall be done without damage to any highway or other property, public or private, and without interference with the rights of the public or private property owners and in accordance with the MDEQ and local requirements for soil erosion and sedimentation control.
- D. The contractor shall receive no extra compensation for providing, maintaining or operating any dewatering or drainage facilities.

1.21 SHEETING, SHORING AND BRACING

- A. Where necessary in order to construct the work called for by the contract, to insure the safety of the workers, or to protect other things of value, the contractor shall use and, if necessary, leave in place, such sheeting, shoring, and bracing as is needed to carry out the work or to adequately insure the stability of such work, or to insure the safety of the workers and/or to protect adjoining things of value. The contractor will receive no extra compensation for sheeting, shoring, or bracing, whether removed or left in place.

1.22 DISPOSAL OF EXCAVATED MATERIAL

- A. With the exception of an amount of excavated materials sufficient for backfilling and construction of fills, as called for on the drawings, all broken concrete, stone, and excess excavated materials shall be disposed of from the site by the contractor. The contractor will be required to obtain his own disposal ground and will receive no extra compensation for disposing of any of the excess materials.

1.23 DISPOSAL OF WASTE MATERIALS

- A. Unless otherwise directed by the owner, all waste materials and debris resulting from the construction work shall be removed from the premises at no extra cost to the owner.
- B. The contractor shall, at all times, keep the premises free from accumulations of waste material or debris caused by his employees or work, and shall remove same when necessary or required by the owner.

1.24 TUNNELING

- A. The contractor shall construct the work in tunnel where shown on the drawings or required by permits, and at other locations may, at his option, construct the work in tunnel where it crosses existing roadways, public and private utilities, walks or other structures. Tunnel work shall be

constructed in accordance with the drawings and specifications, "Road Permit" requirements, or as otherwise noted on the drawings at no extra cost to the owner.

1.25 COMPRESSED AIR

- A. The contractor shall provide compressed air as required for the work at no extra cost to the owner.

1.26 EXPLOSIVES

- A. Explosives may be brought or used on the premises only with the written consent of the owner.
- B. If explosives are used, the contractor shall comply with all laws, rules, and regulations governing their use. The contractor shall be fully responsible for the safety of all persons and property and any approval by the owner shall not relieve the contractor of such responsibility.
- C. All fees and assessments in connection therewith shall be paid for by the contractor, the cost of which shall be included in the proposal. The contractor shall be responsible for furnishing sufficient, properly qualified safety inspectors as required by the state and local governing bodies. The cost of providing for and meeting the requirements for handling explosives shall be at no extra cost to the owner.

1.27 INSPECTION OF PREMISES

- A. The bidder shall visit the premises and thoroughly acquaint himself with the conditions to be encountered in the installation of the work shown on the drawings and described in the specifications, as no extras will be allowed to cover work which he has not included in his tender due to his failure to inspect the premises.

1.28 SCHEDULE OF OPERATIONS

- A. The contractor shall submit, for the owner's review and approval, a schedule of his proposed operations. The contractor's schedule shall be complete and shall show in detail the manner in which he proposed to complete the work under this contract.

1.29 ORDINANCES AND CODES

- A. All work shall be executed and inspected in accordance with all local and state rules and regulations and all established codes applicable thereto and shall conform in all respects to the requirements of all authorities having jurisdiction thereover.
- B. Should any change in the contract plans and/or specifications be required to comply with local regulations, the contractor shall notify the owner in accordance with Specification 00120, Instructions to Bidders. After entering into contract, the contractor will be held to complete all work necessary to meet the local requirements without extra expense to the owner.
- C. Where the work required by the drawings and specifications is above the standard required, it shall be done as shown or specified.

1.30 REQUIREMENTS PERTAINING TO WORK WITHIN RAILROAD RIGHTS-OF-WAY

- A. Where the contract drawings call for work within railroad rights-of-way or where the work crosses under railroad tracks, the contractor shall secure the approval of the railroad company of the method and schedule of operations and shall carry out the work in strict accordance therewith, all to the satisfaction of the railroad company and at no extra cost to the owner.
- B. The owner will pay the cost of all inspectors and flagmen required and furnished by the railroad company during the construction operations.
- C. The additional named insured under General Supplementary Conditions for "Owner and Contractor's Protective Public Liability and Property Damage Insurance" shall include the name of the railroad company.

1.31 TRAFFIC CONTROL

- A. During construction the contractor shall control traffic in accordance with the current edition of the Michigan Manual of Uniform Traffic Control Devices issued by the Michigan Department of Transportation.

1.32 DUST CONTROL

- A. The contractor shall provide adequate measures to control dust caused by his operation. The methods employed, and frequency of application shall be as approved and directed by the Owner.

1.33 INCONVENIENCES

- A. The contractor shall at all times be aware of inconveniences caused to the abutting property owners and general public. Where undue inconveniences are not remedied by the contractor, the municipality, upon four hours notice, reserves the right to perform the necessary work and to have the owner deduct the cost thereof from the money due or to become due to the contractor.

END OF SECTION

SECTION 01030

ALTERNATES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Administrative and procedural requirements for Alternates.

1.2 SEQUENCING AND SCHEDULING

- A. Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the project.
- B. Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.
- C. Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the Work described under each Alternate.
1. Include as part of each Alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.
- D. Types of Alternates required include the following:
1. Additive Alternates. The cost of this Alternate if chosen, will be added to the Base Bid Price listed in the Bid Form.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 SCHEDULE OF ALTERNATES:

- A. Additive Alternate No. 1: Stainless Steel in lieu of painted carbon steel. The work of this Alternate is that all of the steel components as specified in section 11336 will be from stainless steel in lieu of painted carbon steel as specified in this section.
- B. Additive Alternate No. 2. Coating all of the exposed portions of the walls of the existing eight clarifiers as detailed on the plans and specifications.

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- C. Additive Alternate No. 3. Coating the floor of all of the existing existing eight clarifiers as detailed on the plans and specifications.

END OF SECTION

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SECTION 01039

COORDINATION AND MEETINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Related Sections
- B. Coordination.
- C. Pre-Bid Meeting.
- D. Pre-Award Meeting.
- E. Preconstruction Meeting.
- F. Progress Meetings.
- G. Preinstallation Meetings.

1.2 RELATED SECTIONS

- A. Section 00120 – Instructions for Bidders.
- B. Section 00700 - General Conditions.
- C. Section 00800 - General Supplementary Conditions.
- D. Section 01005 - Administration Provisions.
- E. Section 01300 - Submittals.
- F. Section 01310 - Progress Schedules.

1.3 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit,

as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

- D. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's occupancy.
- E. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4 PRE-BID MEETING

- A. Engineer will schedule a meeting as noted in the Information for Bidders.
- B. Attendance Required: Owner, Engineer, and Bidders.
- C. Attendance Requested: Regulatory Agencies, Utility Representatives.
- D. Agenda:
 - 1. Review of Permits Required.
 - 2. Review of Special Project Requirements.
 - 3. Regulatory requirements affecting the project.
 - 4. Review of Contract Documents.
 - 5. Critical work sequencing.
 - 6. Use of premises by Owner and Contractors
 - 7. Construction facilities and controls provided by Owner.
 - 8. Temporary utilities provided by Contractor and by Owner.
 - 9. Survey and layout.
 - 10. Security and housekeeping procedures.
 - 11. Responsibility for testing.
- E. Record minutes and distribute copies within two days after meeting to participants, with one copy to all participants, and those affected by decisions made.

1.5 PRE-AWARD MEETING

- A. Engineer will schedule a meeting prior to issuing Notice of Award.
- B. Attendance Required: Owner, Engineer, and Contractor.
- C. Agenda:
 - 1. Review of Owner-Contractor Agreement.
 - 2. Review of Submission of bonds and insurance certificates.
 - 3. Regulatory requirements affecting the project.
 - 4. Review of Federal, State and Local contract requirements.
 - 5. Review of list of Subcontractors, list of Products, and schedule of values.
 - 6. Designation of personnel representing the parties in Contract, and the Engineer.
 - 7. Critical work sequencing.
 - 8. Use of premises by Owner and Contractor
 - 9. Construction facilities and controls provided by Owner.

- 10. Mobilization
 - 11. Project Coordination
- D. Record minutes and distribute copies within two days after meeting to participants, with one copy to all participants, and those affected by decisions made.
- 1.6 PRECONSTRUCTION MEETING
- A. Engineer will schedule a meeting prior to issuing Notice of Award.
 - B. Attendance Required: Owner, Engineer, major subcontractors and Contractor.
 - C. Agenda:
 - 1. Review of Execution of Owner-Contractor Agreement.
 - 2. Review of Regulatory requirements affecting the project.
 - 3. Distribution of Control Documents.
 - 4. Submission of progress construction schedule.
 - 5. Designation of personnel representing the parties in Contract, and the Engineer.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 7. Critical work sequencing.
 - 8. Use of premises by Owner and Contractor
 - 9. Construction facilities and controls provided by Owner.
 - 10. Mobilization
 - 11. Project Coordination
 - 12. Temporary utilities provided by Contractor and Owner.
 - 13. Survey and layout.
 - 14. Security and housekeeping procedures.
 - 15. Procedures for testing.
 - 16. Procedures for maintaining record documents.
 - D. Record minutes and distribute copies within two days after meeting to participants, with one copy to all participants, and those affected by decisions made.
- 1.7 PROGRESS MEETINGS
- A. The Engineer will schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
 - B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
 - C. Attendance Required: Job superintendent, major Subcontractors and Suppliers, Owner, Engineer, as appropriate to agenda topics for each meeting.
 - D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
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5. Review of submittals schedule and status of submittals.
6. Review of on-site and off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.

1.8 PREINSTALLATION MEETING

- A. When required in individual specification sections, convene a preinstallation meeting at work site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Engineer four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 1. Review conditions of installation, preparation and installation procedures.
 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with copies to Engineer, Owner, participants, and those affected by decisions made.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01210

ALLOWANCES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for processing Allowances. Selected materials and equipment, and in some cases their installation, are shown and specified in the Contract Documents by Allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. Additional requirements, if necessary, will be issued by Change Order.

1.2 DEFINITIONS

- A. Lump Sum Allowance: A monetary sum that includes, as part of the Contract Price, the associated costs and requirements to complete the specified Allowance.

1.3 SUBMITTALS

- A. Submit invoices or delivery slips to indicate actual quantities of materials delivered to the Site for use in fulfillment of each Allowance.

1.4 OWNER'S INSTRUCTIONS

- A. At the earliest feasible date after Contract Award, advise ENGINEER of the date when the final selection and purchase of each product or system described by an Allowance must be completed in order to avoid delay in performance of the work.
- B. When requested by ENGINEER, obtain Bids for each Allowance for use in making final selections; include recommendations that are relevant to performance of the Work.
- C. Purchase products and systems as selected by ENGINEER from the designated supplier.
- D. Use Allowances only as directed for OWNER's purposes, and only by written directives from the Engineer which designate amounts to be charged to the Allowance.
- E. If the actual price for the specified Allowance is more or less than the stated Allowance, the Contract Price shall be adjusted accordingly by Change Order. The adjustment in Contract Price shall be made in accordance with Paragraph 11.02 of the General Conditions.
- F. CONTRACTOR'S overhead, profit and any other costs for administering these allowances shall be included in the Lump Sum bid price. No separate markup for these costs will be allowed for these Allowances with the exception if there is new work authorized under the Owner Controlled Change allowance normal O&P amounts as defined in the General Conditions for all Sub work apply.

- G. At Project closeout, any amounts remaining in Allowances will be credited to OWNER by Change Order.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 INSPECTION

- A. Inspect products covered by an Allowance promptly upon delivery for damages or defects.

3.2 PREPARATION

- A. Coordinate materials and their installation for each Allowance with related materials and installations to ensure that each Allowance item is completely integrated and interfaced with related construction activities.

3.3 SCHEDULE OF ALLOWANCES

- A. Owner Controlled Changes Allowance in the amount of \$300,000.00. This allowance will only be used when directed by the Engineer to the Contractor for additional work which may arise in the course of the project. Any work down under this item shall be included in the billing cycle associated with the completed work.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 SCHEDULE FOR SUBMISSION

- A. Submittal procedures
- B. Submittal Review
- C. Proposed Products list
- D. Shop Drawings, Product Data, and Samples
- E. Manufacture's installation instructions
- F. Manufacture's certificates

1.2 RELATED SECTIONS

- A. Standard General Conditions of the Construction Contract
- B. Section 01400 - Quality Control
- C. Section 01700 - Contract Closeout

1.3 SCHEDULE FOR SUBMISSION

- A. Prior to submitting any shop drawings, product data, portfolios, samples, etc. the Contractor shall prepare a summary, listing all items in the project which he will submit for review by the Engineer.
- B. The summary shall be submitted within twenty (20) calendar days after receipt of Notice to Proceed and shall be updated once per month thereafter.
- C. The summary shall include the proposed dates for submittal for each item for control purposes. The summary shall be prepared in coordination with the Project Schedule for Construction and adequate time shall be allowed therein for review and possible resubmittal.
- D. The summary and schedule for submittals shall not relieve the Contractor of his obligation to comply with specification requirements for items not listed on the schedule.
- E. Nothing herein shall be construed as allowing additional time for completion of the project in the event resubmittal is required for shop drawings or the other items to be submitted.

1.4 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Engineer approved transmittal form.
- B. Sequentially number the transmittal form. Re-submittals shall have original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor and supplier; pertinent drawing and detail number, and specification section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to the Engineer in a manner to allow sufficient time for review and processing by the Engineer so as to not cause delays in the Work. Coordinate submission of related items.
- F. All drawings, information and documentation shall be prepared and submitted with all words in the English language and dimensions in American units. No foreign language or metric units will be permitted.
- G. Identify variations from Contract Documents and Products and system limitations which may be detrimental to successful performance of the completed work.
- H. Provide space for Contractor and Engineer review stamps.
- I. Revise and resubmit submittals as required and identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals to all concerned and related parties. Instruct parties to promptly report any inability to comply with provisions.
- K. The Engineer reserves the right to refuse to check or review any submittal of a subcontractor or manufacturer which is not presented in compliance with the foregoing requirements.
- L. Electronic Submittals:
 - 1. All electronic submittals shall follow the procedures outlined above.
 - 2. Electronic submittal procedures are only applicable to Shop Drawings and product data submittals.
 - 3. Electronic submittals shall be made in a standard format the Engineer has agreed in advance to accept, JPEG, TIF, DGN, DXF, DWG, or PDF.
 - 4. Reviewed submittals shall be returned in JPEG, TIF, or PDF electronic format for the Contractor's printing and distribution.
 - 5. Contractor to provide an electronic, internet based system for uploading, transmitting and reviewing shop drawings and all other project correspondence between the Engineer, Contractor, Owner and other interested parties. System shall be Procore or Submittal Exchange.

1.5 SUBMITTAL REVIEW

- A. All subcontractors and manufacturers' drawings shall first be sent directly to the Contractor, who shall keep a record of the drawing numbers and the dates of receipt. The Contractor shall check thoroughly all such drawings, as regards measurements, sizes of members, materials, and all other details to assure himself that they conform to the intent of the drawings and the specification, and shall promptly return to the subcontractors and/or manufacturers for correction such drawings as are found inaccurate or otherwise in error.
- B. The Engineer will review the Contractor's, subcontractors' and manufacturers' drawings within a reasonable time after receipt thereof and will return one copy endeavoring to indicate, by notation thereon or written instructions, any correction which may be necessary to meet the Contract requirements. The Contractor shall then review such notations and/or instructions and if he concurs therein, shall make or have made such required corrections, and shall, when so noted on the drawings or requested by the Engineer, resubmit corrected drawings to the Engineer as soon as possible, for final review. Such further review by the Engineer will be limited to the corrections only, and the Contractor, by such re-submission shall be held to have represented that such drawings contain no other alterations, additions or deletions, unless the Contractor (in writing) directs the Engineer's specific attention to same. Should the Contractor question, or dissent from, such notations and/or instructions, he shall so inform the Engineer and request further clarification before resubmitting the drawings.
- C. The review of Contractor's, subcontractors', and manufacturers' drawings by the Engineer is for coordination and assistance, and the Engineer does not thereby assume responsibility for errors or omissions. Such errors or omissions must be made good by the Contractor, irrespective of the receipt, review of the drawings by the Engineer, and even though the work is done in accordance with such drawings.

1.6 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Owner-Contractor Agreement submit list of all major products proposed for use, including those previously called for to be submitted in the Proposal, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- C. Substitutions: Whenever a particular brand or make or type of material, equipment, or other item is specified or is indicated on the Contract Drawings, it is for the purpose of establishing a standard of quality, design, and type desired and to supplement the detailed specifications. Any other brand or make or type which in the opinion of the Engineer is equivalent to that specified or indicated may be offered as a substitute, subject to the following provisions:
 - 1. Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature and performance data together with samples of the materials where feasible to enable the Engineer to determine if the proposed substitution is equal to that specified.
 - 2. Contractor shall submit certified tests where applicable by an independent laboratory, acceptable to the Owner, attesting that the proposed substitution is equal.
 - 3. A list of installations where the proposed substitution is used.

4. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the Owner.
5. Where the review of a substitution requires revision or redesign of any part of the work, all such revision and redesign and all new drawings and details required, therefore, shall be provided by the Contractor at his own cost and expense and shall be subject to the review of the Engineer.
6. In all cases, the Engineer shall be sole judge as to whether a proposed substitution is to be incorporated into the project. The Contractor shall abide by the Engineer's decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No substitute items shall be used in the work without review of the Engineer.

1.7 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

- A. The intent of the Contract Documents is to include in the contract price the cost of all labor and materials, water, fuel, tools, plant, equipment, light, transportation, and all other expenses as may be necessary for the proper execution and completion of the work.
- B. While the contract drawings and specifications propose to be complete in all respects as to layout, type of equipment and materials, they are not intended to serve as detailed sleeve or insert drawings, and the preparation of such drawings required or necessary for this purpose, or to set equipment accurately, shall be the responsibility of the Contractor.
- C. These Contract Documents shall be supplemented by other drawings, product data, samples and portfolios of all equipment, apparatus, materials, etc. furnished by the Contractor and reviewed by the Engineer. All such supplementary drawings or instructions are intended to be consistent with the Contract Documents, true developments thereof and reasonably inferable therefrom. Therefore, no extra charge will be allowed on a claim that particular supplemental drawings or instructions differed from the Contract documents, incurring extra work, unless the Contractor has first brought the matter, in writing, to the Engineer's attention for proper adjustment before starting on the work covered by such and has received from the Engineer an order in writing to so proceed.
- D. These original and supplementary drawings constitute the drawings according to which the work is to be done. The Contractor shall keep at the site of the work, copies of all drawings and specifications and shall at all times give the Engineer or Owner access thereto.
- E. Shop Drawings are drawings, diagrams, schedules other data specifically prepared for the Work by the Contractor or a subcontractor, Subcontractor manufacturer, supplier or distributor to illustrate some portion of the Work.
- F. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of these submittals is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.
- G. Product Data are illustrations, standard schedules, performance charts, instructions, catalog cuts, brochures, diagrams, materials lists and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

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- H. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
- I. The Contractor shall review, approve, and submit to the Engineer, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents requested by the Engineer or Owner or otherwise necessary for the proper execution of the work, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents may be returned without action.
- J. The Contractor shall perform no portion of the Work requiring submittal, resubmittal, and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been reviewed by the Engineer. Such Work shall be in accordance with reviewed submittals.
- K. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or contained within such submittals with the requirements of the Work and of the Contract Documents.
- L. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer's review of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submittal and the Engineer has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in the Shop Drawings, Product Data, Samples or similar submittals by the Engineer's review thereof, as the Engineer's review is intended to cover compliance with the Contract Document and not to enter into every detail of the shop work.
- M. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those required by the Engineer on previous submittals.
- N. When professional certification of performance criteria of materials systems or equipment is required by the Contract Documents, the Engineer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.
- O. Shop Drawings
1. Submit in the form of two legible opaque copies.
 2. One reviewed copy will be returned to the Contractor for his duplication and distribution.
 3. After review, produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article herein and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.
- P. Product Data
1. Submit two copies of the documents which the Engineer requires. One reviewed copy will be returned to the Contractor for his duplication and distribution.

2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
3. Product data shall be bound with an index sheet containing a space at least 5" x 8" for review stamps and notes.
4. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01700 - CONTRACT CLOSEOUT.

Q. Samples

1. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
2. Submit samples of sufficient size and representative of finishes indicating textures, and patterns for Owner selection.
3. Include identification on each sample, with full Project information.
4. Submit the number of samples specified in individual specification sections; two of which will be retained by the Engineer.
5. Reviewed samples which may be used in the work are indicated in individual specification sections.

1.8 MANUFACTURER INSTALLATION INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, operating, maintaining and finishing to the Engineer in quantities specified for Product Data.
- B. Identify conflicts between manufacturer's instructions and contract documents.

1.9 MANUFACTURER CERTIFICATES

- A. When specified in individual sections, submit certification by manufacturer to Engineer, in quantities specified for Product Data.
- B. Indicate material or Product meets or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to the Engineer.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01310
PROGRESS SCHEDULES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Format.
- B. Content.
- C. Revisions to schedules.
- D. Submittals.

1.2 RELATED SECTIONS

- A. Standard General Conditions of the Construction Contract
- B. Section 01000 - Specifications General
- C. Section 01300 - Submittals: Shop drawings, product data, and samples

1.3 FORMAT

- A. Provide a critical path method scheduling software for the project, Primavera or equivalent. Note all major tasks and sub-tasks, start date, duration, float and critical path. Show shutdowns and any interruptions to normal plant operations. Show major pieces of equipment, concrete pours and building activities. Show major electrical and mechanical tasks.
- B. Sequence of Listings: The chronological order of the start of each item of Work.
- C. Scale and Spacing: To provide space for notations and revisions.
- D. Sheet Size: Multiples of 11 x 17 inches

1.4 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules to define critical portions of the entire schedule.

- E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the last day of each month.
- F. Provide separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Architect/Engineer. Indicate decision dates for selection of finishes.

1.5 REVISIONS TO SCHEDULES

- A. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
- B. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- C. Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect, on schedules of separate contractors.

1.6 SUBMITTALS

- A. Submit initial schedules within 30 days after date established in Notice to Proceed. After review, resubmit required revised data within ten days.
- B. Submit the number of opaque reproductions which Contractor requires, plus four copies which will be retained by Engineer or, submit one opaque reproduction and one reproducible transparency.

1.7 DISTRIBUTION

- A. Distribute copies of reviewed schedules to Project site file, Subcontractors, suppliers, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01400
QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance - control of installation.
- B. Tolerances
- C. References.
- D. Mockup.
- E. Inspecting and testing laboratory services.
- F. Manufacturers' field services and reports.

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals: Submission of manufacturers' instructions and certificates.
- B. Section 01600 - Material and Equipment: Requirements for material and product quality.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.4 TOLERANCES

- A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.

- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES

- A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date specified in the individual specification sections, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect/Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.6 MOCK-UP

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups are representative of the quality required for the Work.
- D. Where mock-up has been accepted by Architect/Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so.

1.7 INSPECTING AND TESTING LABORATORY SERVICES

- A. Contractor shall appoint, employ, and pay for specified services of an independent firm to perform inspecting and testing, as required.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Engineer or the Owner.
- C. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Engineer or the Owner.
- D. Reports will be submitted by the independent firm to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1. Notify Engineer and independent firm 48 hours prior to expected time for operations requiring services.
 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- F. Testing or inspecting does not relieve Contractor of performing Work to contract requirements.
- G. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspecting or testing charges from the Contract Sum.
- 1.8 MANUFACTURERS' FIELD SERVICES AND REPORTS
- A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and as applicable, and to initiate instructions when necessary.
 - B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
 - C. Submit report in duplicate within 30 days of observation to Engineer for information.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone and fax service, water supply, and sanitary facilities.
- B. Temporary Controls: Fire Protection, Barriers, enclosures and fencing, protection of the Work, and ground and surface water control.
- C. Construction Facilities: First Aid Facilities Access roads, parking, progress cleaning, project signage, existing utilities, structures and temporary buildings.

1.2 RELATED SECTIONS

- A. Standard General Conditions of the Construction Contract
- B. Section 01590 - Field Offices and Sheds.
- C. Section 01700 - Contract Closeout: Final cleaning.

1.3 TEMPORARY ELECTRICITY AND LIGHTING

- A. Cost: By Contractor; provide and pay for power service required from utility source.
- B. The Contractor shall provide all necessary materials and equipment required for temporary service. All circuits shall be insulated, weatherproof, equipped with an equipment grounding conductor. All enclosures and devices shall be weatherproof.
- C. When permanent electrical power and lighting systems are in operating condition, they may be used for temporary power and lighting for construction purposes provided that the Contractor:
 - 1. Obtains the approval of the Engineer.
 - 2. Assumes full responsibility for power and lighting system.
 - 3. Pays all costs for operation and restoration of the systems and for all electrical power consumed.
- D. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.
- E. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- F. Maintain lighting and provide routine repairs.

1.4 TEMPORARY HEAT AND VENTILATION

- A. The Contractor shall provide heat and ventilation as required to maintain specified conditions for construction operations and to protect materials and finishes from damage due to temperature or humidity.
- B. The Contractor shall provide ventilation of enclosed areas to cure materials; to disperse humidity; and to prevent accumulations of dust, fumes, vapors, or gases.
- C. Permanent heating and ventilation systems may be used for temporary heating and ventilation during construction provided the Contractor:
 - 1. Obtains approval from the Engineer.
 - 2. Assumes full responsibility for the entire system.
 - 3. Pays for all costs for operation, maintenance, and restoration of the system and for energy consumed.
- D. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.5 TELEPHONE AND FACSIMILE SERVICE

- A. Provide, maintain and pay for telephone service to field office and Engineer's field office at time of project mobilization, and during the entire duration of the project.
- B. Provide, maintain and pay for facsimile service and a dedicated telephone line to field office at time of project mobilization, and for the entire duration of the project.
- C. Provide for removal of these services at the culmination of the project.

1.6 TEMPORARY WATER SERVICE

- A. Municipal water shall be made available for the Contractor's use provided such service is readily accessible. Any temporary extension of the facilities shall be installed by the Contractor and removed at the completion of his work. The construction of the temporary facilities shall meet all state and local codes and shall include a meter with totalizer. The discriminate use of the Municipal water for normal purposes of construction shall be at no cost to the Contractor. Excessive or indiscriminant use of water will be cause for the Municipality to require the Contractor to pay for the water used.
- B. If connections are made to the hydrants, the Contractor shall obtain authorization from the appropriate Fire Department. The Fire Department standard wrench shall be used for opening and closing the fire hydrants. Fire hydrants shall be pumped out and left dry after each use regardless of the season of the year.

1.7 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain adequate and required facilities and enclosures during the entire duration of the project.

1.8 TEMPORARY FIRE PROTECTION

- A. The Contractor shall follow the standards of the National Fire Protection Association during torch cutting or welding on the job site.
- B. The Contractor shall provide a suitable number of portable fire extinguishers (non-freeze type in cold weather) distributed about the job site.
- C. The Contractor shall store gasoline and other flammable liquids in U.L. listed safety containers in a location away from the building and distribute the liquids directly from the containers. Storage of flammable liquids shall not be allowed inside of any municipal or county building or structure.

1.9 BARRIERS

- A. The Contractor shall provide barricades, and adequate warning flags, signs, and lights in accordance with governing laws and ordinances to protect construction areas, existing facilities, and adjacent properties.
- B. Provide barricades and covered walkways required by governing authorities for public right-of-way and for public access to existing building.
- C. Provide protection for plant life designated to remain. Replace damaged plant life.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.10 FENCING

- A. Provide fencing around construction sites and equip as needed with vehicular and pedestrian gates with locks as shown on the Contract Drawings.

1.11 GROUND AND SURFACE WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment. All water from whatever sources entering the work during any stage of construction shall be promptly removed and disposed. All pumping and drainage shall be done without damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians or vehicular traffic, or the work of other contractors. Dewatering shall be done in such a manner that soil under or adjacent to existing structures shall not be disturbed, removed, or displaced.

1.12 ENCLOSURES

- A. The Contractor shall provide a construction plan layout showing the arrangement of temporary buildings, construction equipment, and storage and work areas. The plan must be approved by the Engineer prior to erection.
- B. The Contractor shall provide temporary insulated weather tight closure of all 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. All access openings shall be approved by the Engineer.

- C. Provide temporary partitions and ceilings as indicated to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
- D. The construction of partitions shall be 2 x 4 framing and sheet materials with closed joints and sealed edges at intersections with existing surfaces.

1.13 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.
- G. Prohibit construction traffic from utilizing permanent site access bridge.

1.14 SECURITY

- A. Provide security and facilities to protect Work, from unauthorized entry, vandalism, or theft.

1.15 FIRST AID FACILITIES

- A. A completely equipped, readily accessible first-aid kit shall be provided and maintained at the job site at all times.
- B. The telephone numbers for summoning aid from outside sources (e.g., Police, Fire, EMS, physicians) shall be conspicuously posted near each phone on the job site.

1.16 ACCESS ROADS

- A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
- B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.

- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.

1.17 PARKING

- A. Provide temporary gravel surface parking areas to accommodate construction personnel.
- B. When site space is not adequate, provide additional off-site parking.
- C. Do not allow vehicle parking on existing pavement.
- D. Designate two parking spaces for the Owner and Engineer.

1.18 TRAFFIC REGULATION

- A. The Contractor's trucks and equipment operations shall be governed by all applicable ordinances; the rules and regulations of the Fire, Police, Transportation Departments; and the requirements of any other authority having jurisdiction. Flagman, warning lights, traffic signs, cones, and barricades shall be provided by the Contractor as necessary to direct and protect vehicular and pedestrian traffic at all locations of construction operations.
- B. The Contractor shall be responsible for obtaining approvals and securing permits from all authorities having jurisdiction over work in rights-of-way.
- C. The Contractor shall notify the Engineer, the local police and fire departments, all other interested local authorities, and the residents of all affected streets five days prior to any street closures.
- D. The Contractor shall provide and maintain all temporary facilities required. These shall include but not be limited to facilities necessary to maintain pedestrian and vehicular traffic access through the area or to adjacent properties and to provide unobstructed access to fire hydrants and water and gas valves. The Contractor shall provide all barriers, lights, warning flags and signals, and the like that the Engineer or other authorities may require to accommodate and protect the public.
- E. Should the Contractor fail to promptly provide or neglect to maintain the required temporary facilities or be dilatory in carrying out specific instruction to the Engineer, the Owner may with or without notice to the Contractor take such remedial measures deemed necessary and charge the Contractor with any costs incurred therefor. Any such action, however, shall in no way serve to release the Contractor from his general or particular liability for the safety of the traveling public or the protection of property.

1.19 PROTECTION OF PROPERTY AND SURVEY MONUMENTS

- A. Before any monuments or stakes marking the boundaries of property along or near the work are removed or disturbed, notify the Engineer in sufficient time so that they can be properly located and reset. Contractor shall pay all costs incurred in connection therewith.

- B. All precautions shall be taken to avoid disturbance of permanent survey monuments of any city, county, state, or federal authority; and when any of these are disturbed or destroyed, the Contractor shall restore them to the satisfaction of such authority and shall pay all costs incurred by such authority in connection therewith.

1.20 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a 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 the space.
- C. Broom 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 weekly and dispose off-site.

1.21 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. 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 01590

FIELD OFFICES AND SHEDS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary field offices and sheds.
- B. Maintenance and cleaning.
- C. Removal.

1.2 RELATED SECTIONS

- A. Section 01500 - Construction Facilities
- B. Section 01600 - Material and Equipment

1.3 USE OF EXISTING FACILITIES

- A. Existing facilities shall not be used for field offices or for storage.

1.4 USE OF PERMANENT FACILITIES

- A. When permanent facilities are enclosed with operable utilities, relocate offices and storage into building, with written agreement of Owner, and remove temporary buildings.

PART 2 PRODUCTS

2.1 MATERIALS, EQUIPMENT, FURNISHINGS

- A. Materials, Equipment, Furnishings: Serviceable, new or used, adequate for required purpose.

2.2 CONSTRUCTION

- A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.
- B. Construction: Structurally sound, secure, weather tight enclosures for office and storage spaces. Maintain during progress of Work; remove at completion of Work.
- C. Temperature Transmission Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
- D. Exterior Materials: Weather resistant, finished materials.

- E. Interior Materials in Offices: Sheet type materials for walls and ceilings, pre-finished or painted; resilient floors and bases.
- F. Lighting for Offices: 50 ft-C at desk top height, exterior lighting at all doors.
- G. Fire Extinguishers: Appropriate type fire extinguisher at each office and each storage area.
- H. Interior Materials in Storage Sheds: As required to provide specified conditions for storage of products.

2.3 ENVIRONMENTAL CONTROL

- A. Heating, Cooling, and Ventilating for Offices: Automatic equipment to maintain 68 degrees F heating and 76 degrees F cooling.
- B. Storage Spaces: Heating and ventilation as needed to maintain Products in accordance with Contract Documents; adequate lighting for maintenance and inspection of Products.

2.4 CONTRACTOR OFFICE AND FACILITIES

- A. Size: For Contractor's needs and to provide space for project meetings.
- B. Telephone: As specified in Section 01500.
- C. Other Furnishings: Contractor's option.
- D. Miscellaneous Equipment: Six adjustable band protective helmets for visitors, one 10 inch outdoor weather thermometer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Fill and grade sites for temporary structures to provide drainage away from buildings.

3.2 INSTALLATION

- A. Install office spaces ready for occupancy within 15 days after date fixed in Notice to Proceed but prior to start of any work.
- B. Parking: Provide two graded and drained parking spaces for use by the Engineer, connected to Engineer's office by a similar surfaced walk.

3.3 MAINTENANCE AND CLEANING

- A. Weekly janitorial services for offices; periodic cleaning and maintenance for office and storage areas.
- B. Maintain approach walks free of mud, water, and snow.

3.4 REMOVAL

- A. When no longer required, remove all buildings, foundations, utility services, and debris.
- B. Restore the area of its original condition or as required by the Contract Documents.

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General Provisions.
- B. Transportation and handling.
- C. Storage and protection.
- D. "Or Equal" Clause
- E. Product options.
- F. Substitutions.
- G. Installation of Equipment.
- H. Damage during tests and instruction period.
- I. Services of manufacturer's engineers.
- J. Equipment manufacturer certification.

1.2 RELATED SECTIONS

- A. Section 00120 - Instructions to Bidders: Product options and substitution procedures.
- B. Section 01400 - Quality Control: Product quality monitoring.

1.3 GENERAL PROVISIONS

- A. Products (including all materials, machinery, equipment, and systems) shall be carefully designed and installed to insure that all required functions are adequately performed within specified degrees of precision and that each unit shall operate with every other part, furnished or existing, to provide a complete integrated system which shall operate to the satisfaction of the Engineer. Any changes or revisions of existing work made necessary by the type and dimensions of furnished products shall be made at the expense of the Contractor, and he shall furnish detail drawings showing such changes or revisions for the approval of the Engineer.
- B. Submit to the Engineer ample proof that each and every part of the products to be furnished is of a reliable make and of a type which has been in successful operation within the continental United States. Installation of any experimental or untried type of apparatus, material, or machinery will not be allowed.

- C. Each major item of equipment shall have the manufacturer's nameplate securely affixed in a conspicuous place. The nameplate shall show the manufacturer's name, address, model number, rating, and any other pertinent data such as speed, horsepower, etc.
- D. All materials, equipment, and accessories shall be new and unused and shall be essentially the products of a manufacturer regularly engaged in the production of such material or equipment and shall essentially duplicate material or equipment that has been in satisfactory operation at least 5 years.
- E. The owner reserves the right to reject any material or equipment manufacturer who, although he meets the above requirements, does not provide satisfactory evidence indicating adequate and prompt post-installation repair and maintenance service as required to suit the operational requirements of Owner. Items of any one type of materials or equipment shall be the product of a single manufacturer.
- F. All piping and equipment furnished under this contract shall be fabricated of such materials that under normal operating conditions harmful substances are not imparted to the water supply system.
- G. Except as otherwise specified or required, equipment shall be primed and finish painted at the factory in accordance with the recommendations or the approved manufacturer. All equipment supplied under this contract shall include at least one quart of finish paint used for touch-up at the completion of construction.
- H. Necessary field painting shall be in accordance with the requirements of Section 09900 - Painting. Any damage to shop coating shall be corrected to the satisfaction of the Engineer.
- I. Certification shall be provided that all materials which may come into contact with potable water meets the National Sanitation Foundation Standard 61 and all MDPH regulations in force at the time of submittals.

1.4 TRANSPORTATION AND HANDLING

- A. Transport and handle Products in accordance with manufacturer's instructions.
- B. Transport and handle all materials in such a manner to avoid breakage, inclusion of foreign materials, and/or damage by water or other causes.
- C. Deliver packaged materials in original unopened containers. Packages or materials showing evidence of damage or contamination regardless of cause will be rejected.
- D. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- E. Repair or replace all items damaged or broken as a result of the Contractor's operation at no cost to the Owner.
- F. When specified in the individual Section, equipment shall be made available for conditional acceptance by the Engineer at the factory prior to shipment.

- G. Equipment shall not be delivered unless it can be immediately incorporated into the work or proper storage facilities are available.
- H. Crate all parts of equipment carefully to facilitate shipping and handling. Crates shall completely protect the equipment and be sufficiently strong to permit lifting and skidding without additional bracing or reinforcement.
- I. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.
- J. Notify the Engineer at least two days in advance of the delivery of equipment.

1.5 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible.
- B. Store sensitive Products in weather tight, climate controlled enclosures.
- C. For exterior storage of fabricated Products, place on sloped supports, above ground.
- D. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.
- F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.6 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers with the provision "No Substitutions": Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for "or Equal" or Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article and Section 01300.

1.7 "OR EQUAL" CLAUSE

- A. Specifying an article, material, or piece of equipment by reference to a proprietary product or by using the name of a manufacturer or vendor followed by the clause "or equal" shall be understood to indicate the type, function, minimum standard of design, efficiency, and quality desired and shall not be construed in such a manner as to exclude products of comparable quality, design, and efficiency.
- B. Comparable products shall be capable of performing equal function and shall be compatible with other equipment, materials, or systems to which they connect or will become an integral part of.
- C. The clause "or approved equal" which may appear elsewhere in the documents shall mean the same as "or equal".
- D. Wherever in the documents an article, material, or piece of equipment is defined by specifying a proprietary product or using the name of a manufacturer or vendor the term "or equal" if not included shall be implied.
- E. Substitutions of "or equal" products are subject to approval of the Engineer. Any costs for review of products shall be borne by the Contractor.

1.8 SUBSTITUTIONS

- A. Refer also to Section 01300.
- B. Engineer will consider requests for Substitutions after the date established in Notice to Proceed.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- D. A request constitutes a representation that the Contractor:
 - 1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
 - 2. Will provide the same warranty for the Substitution as for the specified Product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
 - 1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
 - 2. Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Also provide information required by Section 01300 for

substitutions. Burden of proof is on proposer. All costs for Engineer's review will be paid for by the Contractor.

3. The Engineer will notify Contractor in writing of decision to accept or reject request.

1.9 INSTALLATION OF EQUIPMENT

A. General

1. Contractor shall have on hand sufficient personnel, proper equipment, and machinery of ample capacity to facilitate the work.
2. Contractor shall be responsible for locating, aligning, and leveling all equipment.
3. Complete manufacturer's installation instructions including permissible tolerances shall be furnished with each unit of equipment.
4. All equipment shall be installed in accordance with the approved manufacturer's specifications, drawings, and tolerances under the direct supervision of the required manufacturer's engineer.
5. Equipment shall be erected in a neat and workman-like manner on the foundations at the locations and elevations shown on the drawings unless directed otherwise by the Engineer during installation.

B. Installation

1. Special care shall be used in locating, aligning and, leveling all equipment and parts thereof to insure each item is in the proper position relative to other equipment and that all parts are aligned within allowable tolerances. The Contractor shall be responsible for this accuracy and shall notify the Engineer of any conditions in prior work which would prevent this alignment before proceeding with the work. The Contractor shall employ a competent surveyor to set all lines and levels of equipment to the accuracy required.
2. All blocking and wedging required for the proper support and leveling of equipment during installation shall be furnished by the Contractor. All temporary supports shall be removed except steel wedges and bronze shims which may be left in place with the approval of the Engineer.
3. Each piece of equipment or supporting base bearing on concrete foundations shall be bedded in grout. The Contractor shall provide a minimum of 1-1/2" thick grouting or as indicated on Contract Drawings.

1.10 DAMAGE DURING TESTS AND INSTRUCTION PERIODS

- A. Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and he shall neither have nor make any claim for damage which may occur to equipment prior to the time when the Owner formally takes over the operation thereof.

1.11 SERVICES OF MANUFACTURER'S ENGINEERS

- A. The contract price shall include the cost of furnishing competent engineers or superintendents from each company manufacturing equipment for the Project to:
 1. Assist the Contractor to install, adjust, and test the equipment in conformity with the Contract Documents.
 2. Supervise start-up operations and adequately instruct designated employees of the Owner in the proper operation and maintenance procedures when requested by the

Owner throughout the guarantee period of the equipment. A report on each visit shall be filed by the manufacturer's representative with the Engineer.

1.12 EQUIPMENT MANUFACTURER CERTIFICATION

- A. The Contractor will provide Engineer with written certification obtained from each company manufacturing equipment for the Project that the equipment is installed and does operate in accordance with the manufacturer's recommendations.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.
- E. Lubrication survey.
- F. Spare parts and special tools.
- G. Equipment startup services.
- H. Substantial completion.
- I. Warranties.

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals.
- B. Section 01500 - Construction Facilities.
- C. Section 01730 - Operation and Maintenance Data.

1.3 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 FINAL CLEANING

- A. Complete final cleaning and restoration prior to final project inspection.

- B. Remove all temporary labels, stains and foreign substances. Wash or clean by approved methods all surfaces on which dust and dirt has collected.
- C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- D. Clean debris from drainage systems.
- E. Clean site; sweep paved areas, rake clean landscaped surfaces.
- F. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- G. Restore disturbed area. Lawn area may be seeded unless otherwise noted. Paved area shall be restored to their original condition, compatible with the surrounding area, using like materials and workmanship.
- H. Touchup painted surface. Clean and repaint with matching color all scratched, marred or otherwise damaged painted surfaces of all equipment and enclosures.

1.5 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. As the work progresses, keep a complete and accurate record of all changes in the Contract Documents (including Drawings, Shop Drawings, Product Data, and Specifications) indicating the work as actually installed. All changes shall be neatly shown on blue-line prints of the drawings effected or in the specifications which shall be kept at the job site for inspection by the Owner and the Engineer.
- C. Ensure entries are complete and accurate, enabling future reference by Owner.
- D. Store record documents separate from documents used for construction.
- E. Record information concurrent with construction progress.
- F. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda, Field Modifications and Change Orders.

- G. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish main floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.
- H. On completion of the work, prior to the Contractor's application for final payment and as a condition to its approval by the Engineer and Owner, the Contractor shall arrange such site records in order in accordance with the various sections of the specifications bind them together and index them and deliver them to the Engineer. In addition, the Contractor shall request a complete set of reproducible Contract Drawings, and transfer all as-built revisions and changes to them and deliver them to the Engineer. These drawings shall be dated and marked "As-Built".
- I. All reproducible tracings made by the Contractor, equipment manufacturers, and/or material suppliers shall be corrected to show the work as actually completed or installed and a reproducible copy of these drawings shall then be turned over to the Engineer.
- J. Prints in triplicate of all corrected opaque drawings shall be furnished to the Engineer prior to the issuance of the final estimate.
- K. Written approval or other evidence satisfactory to the Engineer of the final conditions of the work shall be obtained from:
 - 1. Macomb County
 - 2. Detroit Edison Company
 - 3. All public authorities or agencies having jurisdiction over any portion of the work
 - 4. Others as requested by the Engineer in writing.
- L. All public authorities or agencies having jurisdiction over any part of the work shall be determined, and all the requirements of these authorities or agencies with respect to but not limited to inspection, permits, fees, approval, and the like regardless of whether they are listed above or not shall be met.
- M. Submit all documents to Engineer for approval prior to submittal of final Application for Payment.

1.7 LUBRICATION SURVEY

- A. A lubrication survey, made by a lubricant supply firm, shall be provided and paid for by the General Contractor, subject to the approval of the Engineer.
- B. The lubrication survey shall list all equipment, the equipment manufacturer's lubrication recommendations, and an interchangeable lubricants tabulation standardizing and consolidating lubricants whenever possible.

- C. The General Contractor shall supply all lubricants, applicators and labor for lubricating the equipment in accordance with manufacturers' recommendations, for field testing and prior to final acceptance. A supply of required lubricants sufficient for start-up and initial operation shall also be supplied by the General Contractor.
- D. Five copies of the approved lubrication survey shall be furnished prior to final acceptance and shall be included within O & M Manuals furnished under Section 01730.

1.8 SPARE PARTS AND SPECIAL TOOLS

A. Spare Parts

- 1. As soon as practicable after approval of the list of equipment, the Contractor shall furnish spare parts data for each different item of equipment listed. The data shall include a complete list of parts and supplies with current unit prices and source of supply.
- 2. Contractor shall also furnish a list of parts and supplies that are either normally furnished at no extra cost with the purchase of the equipment or specified to be furnished a part of the Contract and a list of additional items recommended by the manufacturer to assure efficient operation for a period of 1 year at the particular installation.
- 3. The foregoing shall not relieve the Contractor of any responsibilities under the guarantee provisions of these Specifications.
- 4. The Contractor shall deliver all spare parts required by this contract to the Engineer or as directed by the Engineer.

B. Special Tools

- 1. Contractor shall furnish at no additional cost to the Owner with each piece of equipment, one complete set of suitably marked special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment.
- 2. Contractor shall submit for approval by the Engineer a complete list of the special tools and appliances to be furnished. Such tools and appliances shall be furnished in approved painted steel cases properly labeled and equipped with good grade cylinder locks and duplicate keys.
- 3. The Contractor shall deliver all special tools required by this contract to the Engineer or as directed by the Engineer.

C. Keys

- 1. The Contractor shall deliver four keys for each lockset and padlocks installed under this Contract.
- 2. The keys shall be tagged with locations, room numbers, and key numbers.
- 3. The Contractor shall deliver all keys required by this contract to the Engineer or as directed by the Engineer.

1.9 EQUIPMENT START-UP SERVICES

- A. Equipment start-up period for the training of plant personnel shall begin after satisfactory completion and acceptance of the field tests and coincidentally with the certified date of substantial completion for that part of the work for which the equipment is included. If the equipment is not covered by a certificate of substantial completion for a part of the work, the period shall begin upon substantial completion of the project.

- B. During the equipment start-up period, the Contractor shall furnish at no additional cost to the Owner the services of factory trained representatives of the equipment manufacturers for the equipment designated in the Specifications to:
 - 1. Assist in the start-up and operations of the equipment.
 - 2. Assist in the training of facility personnel, designated by the Owner, in the proper operation and maintenance of the equipment.
- C. The Owner shall:
 - 1. Provide the necessary personnel to be instructed in the operation and maintenance of the equipment. The Owner's personnel shall operate all equipment.
 - 2. Pay for all fuel, power and chemicals consumed beyond quantities specified or in the Contract Documents or required due to Contractors fault. The Contractor shall pay for fuel, power, and chemicals consumed up to the date of "certified substantial completion" except as otherwise specified herein.
- D. Contractor shall be available to promptly repair all work during the start-up period so as to cause minimum disruption to the total facility operation.
- E. In the event a system, equipment, or component proves defective or is unable to meet specified performance criteria, the Contractor shall replace the defective item and the one year guarantee period for the item shall start after satisfactory replacement and testing of the item.

1.10 SUBSTANTIAL COMPLETION

- A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy and utilize the facilities for its intended use.
- B. When the Contractor considers that the Work, or portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Engineer a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, the Engineer will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Engineers inspection discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall complete or correct such item upon notification by the Engineer. The Contractor shall then submit a request for another inspection by the Engineer to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Engineer will prepare a Certificate of Substantial Completion which shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

1.11 WARRANTIES

- A. Provide duplicate copies of all warranties.
- B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers with a Table of Contents in three D side ring binder with durable plastic cover.
- C. Submit warranty documents prior to final Application for Payment.
- D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.
- E. All parts of the work or equipment which is in the opinion of the Engineer prove defective in material, workmanship, or operation within the warranty period shall be removed and replaced or repaired in a manner satisfactory to the Engineer and at no cost to the Owner.
- F. Any service material or equipment required because of the defect shall be supplied without charge.
- G. All work specified to be designed by the Contractor shall be guaranteed to perform as specified.
- H. The Warranty period shall be one year from the date of Substantial Completion unless:
 - 1. A greater period is specified elsewhere.
 - 2. Owner chooses to take over and use a portion of the Work as provided for in the Specifications; in which case the warranty shall be one year from said takeover and use.
- I. Equipment or work replaced and/or repaired during the warranty period shall be guaranteed for one year from the date of acceptance of the repair or replacement or until expiration of the original warranty period whichever comes later.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01730

OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Format and content of manuals.
- B. Instruction of Owner's personnel.
- C. Submittals.

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals
- B. Section 01400 - Quality Control
- C. Section 01600 - Material and Equipment
- D. Section 01700 - Contract Closeout
- E. Individual Specifications Sections: Specific requirements for operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.4 FORMAT

- A. Prepare data in the form of an instructional manual.
 - A. Binders: Commercial quality, 8-1/2 x 11 inch three D side ring binders with durable plastic covers; 3 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings. Fill binders to no more than 75% capacity.
 - B. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; Volume number, General Contractor name and address and Engineer name and address.
 - C. Provide tabbed indexes for each separate product and system, with typed description of product and system.
 - D. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
 - E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
-

- F. Arrange content by process flow under section numbers and sequence of Table of Contents of this Project Manual.

1.5 CONTENTS, GENERAL FOR EACH VOLUME

- A. Table of Contents: Provide title of Projects and the names, addresses, and telephone numbers of Engineer, Subconsultants, and Contractor in the heading. Next, provide a schedule of products and systems, indexed to content of the volume.
- B. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Bind in copy of each.

1.6 MANUFACTURERS MANUALS FOR EQUIPMENT AND SYSTEMS

- A. Each Item of Equipment and Each System: Include description of unit or system, and component parts with diagrams, charts, capabilities, etc. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, complete nomenclature and model number of replaceable parts, and catalog data or literature with correct model number of equipment noted where literature covers more than one model.
- B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications, either typed or by label machine.
- C. Include color coded wiring diagrams as installed.
- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions and drawings; and alignment, adjusting, balancing, calibration and checking instructions.
- F. Provide preventive maintenance recommendations servicing and lubrication schedule, and list of lubricants required. Include manufacturer's printed storage and installation instructions with alignment instructions and tolerances.

- G. Include manufacturer's printed operation and maintenance instructions. Provide trouble shooting guide for equipment and system components.
- H. Include sequence of operation by controls manufacturer.
- I. Provide original manufacturer's detailed parts list and parts drawing, illustrations, assembly/disassembly drawings and instructions, and diagrams required for maintenance. Provide a cross reference to all individual component manuals for all parts lists and illustrations provide correct parts numbers. All bearing numbers shall be listed.
- J. Provide control diagrams by controls manufacturer as installed.
- K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed for equipment systems.
- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams for each equipment system.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage and how to obtain them.
- N. Include test and balancing reports as specified in Section 01400.
- O. Additional Requirements: As specified in individual Product specification sections.
- P. Provide a listing in Table of Contents for design data, with tabbed indexed and space for insertion of data.

1.7 INSTRUCTION OF OWNER PERSONNEL

- A. Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
- B. For equipment requiring seasonal operation, perform instructions for other seasons.
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.
- E. Refer to individual equipment specification section for instruction and training requirements.

1.8 SUBMITTALS

- A. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- B. Submit 2 copies of completed volumes by the 90% completion level of the project. These copies will be reviewed and 1 copy returned to the Contractor with Engineer's comments.

The contents shall be revised and 4 revised copies of the completed volumes shall be resubmitted within 60 days. PDF versions of the manuals shall also be provided.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01800

TRAINING

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Instruct and train Owner's personnel in maintenance and operation of equipment for systems supplied and/or installed under this Contract, including the following items:
 - 1. All process, mechanical, service and other equipment as noted in the detailed specifications.
 - 2. System instrumentation.
 - 3. Primary switchgear.
 - 4. Motor control centers.
- B. Incorporate the following maintenance and operation data and training services into the training program:
 - 1. Shop Drawings.
 - 2. Equipment Operation and Maintenance Manuals.
- C. Prepare instruction training materials, and student notes/guides for complete classroom and hands-on training of all individuals requiring training.

1.2 RELATED REQUIREMENTS

- A. Division 1 - General Requirements including:
 - 1. Section 01300 - Submittals.
 - 2. Section 01310 - Project Schedules.
 - 3. Section 01600 - Material and Equipment.
 - 4. Section 01700 - Contract Close Out.
 - 5. Section 01730 - Operation and Maintenance Data.
- B. Division 15 - Mechanical:
- C. Division 16 - Electrical:

1.3 QUALITY ASSURANCE

- A. Preparations of training materials and instruction to be provided shall be performed by personnel trained and experienced in maintenance and operation of equipment and systems to be installed under this Contract.

1.4 SCHEDULE OF CONDUCTING TRAINING

- A. Classroom and field training programs shall be conducted after performance testing begins but prior to substantial completion.

- B. Training programs shall be planned and conducted for:
 - 1. Operations Personnel.
 - 2. Maintenance Personnel.
- C. All scheduling shall be coordinated through the Engineer.

1.5 TRAINING FOR MAINTENANCE OF INSTRUMENTATION

- A. Train the Owner's maintenance personnel as follows:
 - 1. Describe the overall function of each instrument and control loop installed under this Contract.
 - 2. Locating the probable source of malfunction in the instrumentation equipment and control loops, determining the symptoms of the trouble, establishing the probable cause and effecting a solution.
 - 3. Taking appropriate, preventive, and corrective maintenance procedures necessary to keep the instrumentation system in proper operating condition, including calibration and testing.
- B. Course materials to be used for training Owner's maintenance personnel shall include pertinent portions of the submittals specified in the Specifications such as loop diagrams, calibration data, trouble-shooting guides and maintenance instructions.
- C. The training program shall not include the time required for system start-up instructions or the field acceptance test.

1.6 TRAINING FOR ELECTRICAL AND MECHANICAL MAINTENANCE

- A. Train the Owner's maintenance personnel as follows:
 - 1. Describe the functions of the equipment installed under this Contract.
 - 2. Component preventive and corrective maintenance activities required to keep unit equipment in good operating conditions.
 - 3. The Contractor shall instruct the personnel in locating the probable source of equipment malfunctions, determining the symptoms of the trouble, establishing the probable cause, and effecting a solution.
- B. Course materials to be used for training Owner's electrical and mechanical maintenance personnel to include pertinent portions of the operation and maintenance manuals as well as alignment tolerances, lubrication schedules, vibration analysis instruction and parameters, trouble-shooting guides and special calibration test and procedures.
- C. Method of training electrical and/or mechanical maintenance personnel shall include the Contractor using the Owner's equipment to demonstrate trouble-shooting, preventive, and corrective maintenance procedures.
- D. The field training program shall not include the time required for system start-up instructions or the acceptance test.

1.7 OPERATIONAL TRAINING

- A. Train the Owner's operations personnel as follows:

1. Describe the functions of the equipment installed under this Contract, including how the components of a system are controlled together and what the effects of the control methods are on the system and on other upstream and downstream processes installed under this Contract.
 2. Implement start-up and shutdown procedures for each piece of equipment individually, as well as the start-up and shutdown of the systems comprising the equipment. This instruction shall include normal operation, alternative operations, and emergency operations.
 3. Understand the functions of the equipment installed under this Contract, describing the individual components and how each component is used in monitoring and/or controlling equipment and/or processes installed under this Contract.
 4. Discuss the operating modes possible as a result of the modifications and installations made under this Contract.
 5. Locating the probable source of system trouble determining the symptoms, establishing the probable cause, and re-stabilizing system efficiency or systems installed under this contract.
 6. Demonstrate necessary precautions for safe operation of the equipment, instrumentation, and control system installed under this Contract.
 7. Demonstrate emergency procedures for equipment and systems installed under this Contract.
- B. Course materials to be used for training Owner's operation personnel include pertinent portions of the Operations and Maintenance Manuals, including start-up and shutdown procedures; descriptions of equipment and instrumentation functions and modes of operations, control and monitoring; trouble-shooting instructions and process control instructions.
- C. Methods of training Owner's operations personnel shall include a field training program at the Owner's site consisting of classrooms and hands-on training using the Owner's equipment and systems.
- D. The field training program shall not include the time required for system start-up instructions or the field acceptance test.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02030

SEQUENCE OF CONSTRUCTION AND SPECIAL PROJECT REQUIREMENTS

PART 1 SEQUENCING REQUIREMENTS

1.1 GENERAL

- A. The Contractor shall schedule and arrange his work so that the existing WPCF will remain in continuous service, without interruption.

1.2 NEW CONSTRUCTION/DEMOLITION

- A. Two tanks at a time will be released to the contractor to do the work on. After these tanks are completed and operational, two more tanks will be released to work on, and so on. It is not known at this time if the first two tanks will be Battery A or Battery B tanks. The remaining six tanks not being worked on shall remain in service throughout the duration of the project.

1.3 COORDINATION

- A. The Contractor shall make provisions to allow WPCF operations staff to have access to all required areas for operations.

1.4 SPECIAL PROJECT REQUIREMENTS

A. Concrete Testing

1. Concrete quality control including concrete compression tests shall be performed by a laboratory acceptable to the Owner at the Contractor's expense.
2. Copies of test reports shall be furnished to the Owner and distributed to parties designated by the Owner, including the Contractor.

B. Progress Payments

1. This contract is based on a lump sum price bid, therefore all work completed in each specific area will be paid for based on "percentage complete" of the total monetary value for that item listed in the Contractor's itemized cost breakdown. All references to the contrary in these specifications are superseded by these requirements.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 02050
DEMOLITION WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Building/concrete structure demolition.
- B. Selective demolition of building elements for alterations purposes.
- C. Selective demolition of mechanical equipment.
- D. Selective demolition of electrical equipment.
- E. Abandonment and removal of existing utilities and utility structures.
- F. Salvage of existing items to be reused or delivered to Owner.

1.2 RELATED REQUIREMENTS

- A. Section 02030 Sequence of Construction
- B. Division 15000 Mechanical
- C. Division 16000 Electrical.

1.3 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
- C. NFPA 820 - Standard for Fire Protection in Wastewater Treatment and Collection Facilities, current edition.

1.4 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01300 - Administrative Requirements, and the General and Supplementary Conditions.
- B. Furnish a detailed sequence of demolition and removal work to ensure the uninterrupted progress of Owner's operations. Sequence shall be compatible with overall work sequence of construction.
- C. Health and Safety Plan (HASP). Submit a HASP for workers exposed to sewage sludge materials or other hazards as part of this work.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
- B. The Michigan Building Code shall control the demolition, modification or alteration of the existing buildings or structures.

1.7 PROJECT CONDITIONS

- A. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- B. This project is in a municipal wastewater treatment plant. The work will involve contact with sewage sludge which contains pathogens and other bacteria which can affect human health. Proper care and protection for all workers coming in contact with these materials is the responsibility of the contractor. A Health and Safety Plan shall be prepared by the CONTRACTOR for this purpose.
- C. Protection. Erect and maintain barriers, lights and other protective devices to prevent access to areas under construction or within the influence of the ongoing work. Provide free and safe passage to and from adjacent structures which are being used by the Owner for ongoing operations of the treatment plant.
- D. The Owner and ENGINEER assume no responsibility for the actual condition of the structures/equipment to be demolished or modified. Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within a structure may occur prior to the start of demolition work.
- E. Repairs to Damage. Promptly repair damage caused to adjacent facilities by demolition operation when directed by the ENGINEER at no cost to the Owner. Repairs shall be made to a condition at least equal to that which existed prior to construction.

1.8 CONTRACTOR'S SUPERVISION

- A. Contractor's responsibility shall include a completely equipped first aid kit, provided and maintained at the site in a clean orderly condition and shall be readily accessible at all times to all the Contractor's employees.
- B. The Contractor shall designate certain employees who are properly instructed to be in charge of first aid. At least one such employee shall be available whenever work is in progress at the demolition site.
- C. Telephone call lists for summoning aids from outside sources, such as doctors, ambulances, and rescue squads, shall be conspicuously posted at the site.

1.9 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 5. Provide, erect, and maintain temporary barriers and security devices.
 - 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 - 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 8. Do not close or obstruct roadways or sidewalks without permit.
 - 9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
- B. Do not begin removal until receipt of notification to proceed from Owner.

- C. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - 2. Protect items from damage during transport and storage.
 - 3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Protect existing structures and other elements that are not to be removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.
 - 4. No jackhammering or other destructive methods of construction shall be used in areas where adjacent facilities which are to remain, and which may be damaged by such operations exist unless approved prior by ENGINEER.
- E. Partial Removal of Paving, Concrete structures and Curbs: Neatly saw cut at right angle to surface.

3.2 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.3 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as shown.

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2. Report discrepancies to Engineer before disturbing existing installation.
 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
 4. When general items are noted for demolition, it is assumed that appurtenances and incidental items associated with the general item should also be demolished and removed.
- B. Separate areas in which demolition is being conducted from other areas that are still occupied.
1. Provide, erect, and maintain temporary dustproof partitions of construction where required.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage. Prevent freezing temperatures from occurring. Maintain a minimum temperature of 40F in all areas where are being used by the City for plant operations or higher temperature if necessary to operate remaining equipment.
- D. Remove existing work as indicated and as required to accomplish new work.
1. Remove items indicated on drawings. Where piping or electrical lines are removed back to a functioning point, cut/cap/properly terminate the remaining functioning component.
 2. When pipes, conduits other equipment are removed, all fasteners for that equipment shall also be removed and all holes/damage to the existing structures from which the equipment was attached shall be filled and repaired with like materials.
- E. Mechanical/Electrical (Including but not limited to Process equipment, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 3. Verify that abandoned services serve only abandoned facilities before removal.
 4. When a piece of equipment is shown to be removed, it shall be assumed that the power feed to that piece of equipment including conduit/wire/starter shall also be removed unless shown otherwise.
 5. All piping interconnecting pieces of equipment and/or associated with the system to be removed shall be removed even if not specifically shown to be removed on the drawings. All pipe supports associated with removed piping shall be removed.
 6. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.
 7. Remove concrete equipment bases for equipment to be removed to the building foundation/floor. Patch existing floor smooth with non-shrink grout or suitable epoxy finish for sure
 8. Where vents or other pipes/conduits that are to be removed pass through an existing roof/floor/wall that is to remain, the resulting hole in the roof/floor/wall shall be patched and made watertight to match the existing materials.
-

9. All existing electrical equipment and fixtures to be removed shall be removed with such care as may be required to prevent unnecessary damage, to keep existing systems in operation, to allow for relocation where shown and to maintain the integrity of the grounding systems.
10. Conduits and wires shall be abandoned or removed where shown. All wires in abandoned conduits shall be removed and disposed of off-site as required. Abandoned conduits concealed in floor or ceiling slabs or in walls, shall be cut flush with the slab or wall at the point of entrance. The conduits shall be suitably plugged and the area repaired in a flush, smooth and approved manner. Exposed conduits and their supports shall be disassembled and removed from the site.

F. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

G. Building/Structure demolition.

1. Demolish concrete and masonry in small sections.
2. Wherever possible, sawcut materials to be removed. Where jackhammering or other destructive means are required, care shall be taken to protect existing remaining equipment/structures.
3. Remove structural framing members and lower to ground by means of hoists, derricks, or other suitable methods.
4. Remove structures to the lines and grades shown unless otherwise directed by the ENGINEER. Where no limits are shown, the limits shall be 4-inch outside the item to be installed. The removal of masonry beyond these limits shall be at the Contractor's expense and these excess removals shall be reconstructed to the satisfaction of the Engineer with no additional compensation to the Contractor.
5. After removal of parts of all of walls, slabs and like work which tie into new work or existing work, the point of junction shall be neatly repaired so as to leave only finished edges and surface exposed.

3.4 DEBRIS AND WASTE REMOVAL

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an approved landfill.
- B. Do not allow demolished materials to accumulate on-site.
- C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- D. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- E. Leave site in clean condition, ready for subsequent work.
- F. Clean up spillage and wind-blown debris from public and private lands.

3.5 DISPOSAL OF TANK CONTENTS

- A. The Contractor shall remove and dispose of the contents of tanks, wells, etc. as required to perform the Work.
- B. Liquid in tanks may be returned to the treatment plant process stream with written approval of the Owner.
- C. Provide written certification to the Owner that disposal of tank contents is in accordance with applicable state and federal regulations.

3.6 CLEANING

- A. The Contractor shall clean existing surfaces as required to perform the Work including tanks, wells, channels, floors, walls, etc.
- B. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

3.7 SALVAGE SCHEDULE

- A. Existing Items to Be Removed and Salvaged to the Owner, including but not limited to:
 - 1. Half of the existing stainless steel railing shall be turned over to the Owner. This railing shall be carefully removed so that it is not damaged.
 - 2. Air compressor adjacent to proposed Filter No. 3 shall be turned over to the Owner. Compressor shall be carefully removed prior to demolition of the concrete equipment pad.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General
- B. Site Preparation
- C. Excavations
- D. Unauthorized Excavation
- E. Subgrade
- F. Slopes, Sheeting and Bracing
- G. Backfill
- H. Flowable Fill
- I. Finish Grading

1.2 RELATED SECTIONS

- A. Section 01400 - Quality Control
- B. Section 01500 - Construction Facilities

1.3 GENERAL

- A. All excavation and backfilling shall be performed that is necessary to complete the work under this Contract. Excavation shall include the loosening, loading, removing, transporting, stockpiling, and disposing of all materials of every sort, necessary to be removed for purposes of construction; the furnishing, placing, and maintaining of all sheeting, bracing, and timbering; the care of existing roads, existing structures, utilities; and all incidental and collateral work necessary to complete the entire work as specified and as shown on the Drawings.
- B. Backfilling shall include the filling of the excavated and void spaces around and over the outside of completed structures and pipes. It is also the intention of these specifications to provide that backfill shall be so compacted that no appreciable subsequent settlement will occur, and so that sidewalks, driveways, roads and berms may be placed or replaced shortly after completion of backfilling.

- C. The Contractor will be held to have compared the conditions of the site where work is to be performed with the drawings and specifications and to have satisfied himself as to the conditions of the site, existing conditions, and any other conditions affecting the carrying out of the work, before delivery of his proposal. It is expressly understood that he will obtain first hand information concerning the available facilities for receiving, transporting, handling and storing construction equipment and materials and concerning other local conditions that may affect his work.
- D. The Contractor shall draw his own conclusions as to soil and/or rock conditions to be encountered and he shall complete the work under any job or field condition which was present and/or ascertainable prior to bidding.
- E. He shall also complete the work under whatever conditions he may create by his own sequence of construction, construction methods, or other condition he may create at no additional cost to the Owner.
- F. The Contractor shall be responsible for evaluating the compatibility of his construction methods with the Plans, Specifications and Soil Information provided by the Owner for bidding purposes.
- G. No allowance or extra consideration on behalf of the Contractor will subsequently be allowed by reason of error or oversight on the part of the Contractor.
- H. This contractor shall grade all areas within his work area and provide slopes, shoulders, berms, and level surfaces defined according to existing and established grades.
- I. Care shall be taken to retain, at all times, normal flow of drainage water on the property and all present above ground and underground utilities.
- J. All work shall be done in a thorough and workmanlike manner and in conformance with accepted good practices and all requirements of local, state, and federal authorities having jurisdiction.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable state and local codes for disposal of excavated materials judged not suitable for backfill.
- B. Obtain disposal permit from Local Enforcing Agency.

1.5 QUALITY ASSURANCE

- A. Comply with all code, laws, ordinances, and regulations of governmental authorities having jurisdiction over this part of the work.
- B. Backfill materials shall be compacted to not less than specified percentage of optimum dry density as determined by ASTM D 698.
- C. Testing of backfill material will be done in accordance with ASTM D 2922, ASTM D 1556, and ASTM D 3017.

- D. Unsuitably compacted backfill materials shall be removed and recompact.

1.6 SITE CONDITIONS

- A. Provide and maintain barricades, warning lights, warning signs, and other protection required by applicable laws for safety of persons and property.
- B. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent earth movement.
- C. Notify Owner of unexpected subsurface conditions and discontinue affected work area until notified to resume work.

1.7 HAZARDOUS/CONTAMINATED MATERIAL

- A. The following indicators shall be used by Owner onsite observers during excavation to identify materials suspected of being hazardous or contaminated and requiring disposal in a Type I or Type II landfill.
 1. Materials other than general construction debris of a color not consistent with the natural soils observed in the area;
 2. Materials other than general construction debris of a consistency that is not consistent with the natural soils observed in the area;
 3. Man-made containers, vessels, tanks, or barrels;
 4. Electric devices;
 5. Insulation or fibrous material that may contain asbestos;
 6. Material that emits a chemical or petroleum odor.

Based on these observations, materials in question shall be stockpiled separately, inspected, and representative samples should be collected and screened in the field. Materials should be stored on plastic sheeting at the predesignated, secure location on the parcel or an adjacent parcel and covered with plastic sheeting until disposal is determined.

- B. Potentially hazardous materials should be screened in the field by qualified personnel for the presence of volatile organic compounds (VOC) using a photoionization (PI) meter. It is assumed that the presence of VOCs should provide a general indicator of the presence of other potentially hazardous chemicals.

Materials to be subjected to further laboratory analysis should be selected based on the results of the field screening and observations made by the person monitoring the excavation.

- C. Based on the field screening and laboratory analysis, the Contractor will be advised by the Owner as to the required method of disposal.
- D. The Owner will be responsible for testing of hazardous/contaminated material.
- E. Refer to Section 00700 - General Conditions, Section No. 50 for additional requirements.

PART 2 PRODUCTS

2.1 AGGREGATE BASE

- A. Aggregate Base, 21AA Limestone: Michigan Department of Transportation 21AA (limestone only) dense graded aggregate in accordance with Section 902 of the 2012 Standard Specifications for Construction, compacted to the cross-section indicated on the Contract Drawings.

2.2 BACKFILL

- A. All material necessary to complete the backfill as shown on the drawings or to replace excavated unsuitable material shall be furnished by the Contractor. Backfill at the structures and all buried utilities, unless otherwise indicated on the Drawings, backfill replacing unsuitable material, backfill under gravel or stone and paved roads, shall all be granular material conforming to Michigan Department of Transportation (MDOT) Granular Materials Class II. If suitable material for backfilling is not available on site then suitable material shall be brought in from an off-site borrow pit by the Contractor at no additional cost to the Owner.
- B. The Owner shall have the right to reject any backfill material which when used in the work, does not accomplish the required compaction.
- C. All backfill material shall be free from large or frozen lumps, concrete rubble, blue clay, sod, wood, debris, and other extraneous material.

2.3 FLOWABLE FILL

- A. Where called for on the Drawings certain areas of the excavation and areas of existing structures shall be backfilled with flowable fill.
- B. Flowable fill shall consist of a mixture of fly ash, cement and water such as "C-Fill" as manufactured by Clawson Concrete or "M-Crete" as manufactured by Michigan Foundation or equal.
- C. Cement shall be Portland Cement conforming to A.S.T.M. C 150 Type I. Air entrained cement, pozzolan, and other types of cement shall not be used. Fly ash shall conform to the requirements of A.S.T.M. C618, Class F. Water shall be potable.
- D. The stabilized fly ash mixture shall contain 4 to 5% Portland cement based on the dry weight of the fly ash. Occasional batches of mixture with a cement content of 3-4% will be allowed provided immediate action is taken to restore the cement content to the specified range. Mixtures containing less than 3% shall not be used. The mixture shall have a slump of 10 to 12 inches at the point of placement. The mix temperature shall not be lower than 50°. The mixture shall have a compressive strength of 100 psi minimum at 28 days.
- E. The method used to measure fly ash and cement shall be submitted for acceptance. The contractor's proposed method shall be one that compliments the type of mixing plant being used and provides assurance that the percentage of cement is being satisfactorily controlled. Cement content shall be based on the dry weight of the fly ash in the mix. The batched weight

of fly ash shall be corrected for its moisture content. Water shall be measured, although its control will be a function of consistency (slump and workability) of the mix.

- F. The flowable fill may be mixed by a pug mill, central concrete mixer, turbine mixer or other acceptable equipment or method. Provisions shall be made to maintain the mix temperatures and slump as stated.
- G. The material shall be placed by end or side dumping, tremie, pump, conveyors, or other suitable method. Lines and grades shall be as shown on the design drawings. Stabilized fly ash shall be protected from freezing temperatures for the initial 24 hours after placement. Protection may consist of earth cover, straw, or a sacrificial layer of the stabilized fly ash mix.

PART 3 EXECUTION

3.1 EXCAVATIONS

- A. The Contractor shall make all excavation necessary for the construction of all work called for by the drawings or specified herein.
- B. Excavations shall be made to the line and grade shown on the drawings including removal of unsuitable soils from under structures or roads, or as required to meet MIOSHA regulations. Side slopes of unbraced excavations shall be such as to prevent slides which might injure the work. The Contractor shall conduct his excavation and other operations in such a manner as to ensure that the bed for footings and foundations remains free from rutting, trampling, or other undue disturbance. The beds for footings and foundations shall be true to grade and free of all loose material before any concrete is put in place. All unauthorized excavation below grade of any structure shall be backfilled with concrete to the proper grade at the Contractor's expense. The Contractor shall make all necessary fills to bring grade to finished grade shown on the drawings. Fills and cuts shall be graded to a uniform, smooth, and even grade to grades as shown on the Drawings to meet Owner's approval. Existing underground utilities that are to remain in place shall be protected and any damage caused by excavating shall be made good.
- C. Control the grading in the vicinity of excavated areas so that the surface of the ground will be properly sloped to prevent water from running into the excavated areas. Such areas shall be kept reasonably dry at all times. Accumulated water in the excavated areas shall be removed by pumping.
- D. Broken concrete or rubbish unsuitable for backfill shall be disposed of by the Contractor. Borrow material shall be graded in such a way that surface water will continue to drain in a manner similar to the drainage patterns present before filling occurred. Broken concrete and rubbish shall be disposed of off-site.

3.2 UNAUTHORIZED EXCAVATIONS

- A. Whenever the excavation is carried beyond the lines and grades established by the drawings or as approved by the Owner, the Contractor shall, at his own expense, fill all such excavated space with an approved material and in such a manner as to meet the approval of the Owner.

- B. Unauthorized excavation beneath structures shall be filled with plain concrete, or flowable fill as determined by the Owner.

3.3 SUBGRADE

- A. The subgrade for all structures shall be prepared so as to have as near as practicable a uniform density throughout the entire area. The subgrade shall be compacted to 95% maximum density at optimum moisture content as specified in AASHTO-180 or by Michigan Cone density, whichever is greater, by rolling or by other approved methods. After being prepared, the subgrade shall be maintained until concrete has been placed thereon.
- B. If, through neglect or delay on the part of the Contractor, the earth at subgrade elevation becomes unsuitable for the support of the work to be constructed thereon, the Contractor shall excavate down to solid earth, and shall backfill to the required subgrade elevation with plain concrete, compacted sand, or other suitable material as required to meet the Owner's approval. Unstable subgrade soil under all concrete foundations shall be replaced with plain concrete.
- C. All subgrades shall be approved by the Engineer before proceeding with backfilling and compaction, landscaping, or other construction work.
- D. Subgrades shall be level and clean of all loose rock, dirt, and debris and free of standing water prior to placing concrete.

3.4 SLOPES, SHEETING, AND BRACING

- A. All slopes shall be cut and maintained to the proper degree required for stability. Sheeting and bracing shall be placed and maintained as indicated and/or whenever required for safety to men and the work. The degree of slope for all excavations shall be fixed by the Contractor, and shall comply with all State and Federal safety requirements.
- B. The Contractor shall provide, install, and maintain all shoring, sheet piling, and bracing required to maintain banks of excavations and other construction, and assume full responsibility for same. The design of all shoring systems shall be performed by an Engineer registered in the State of Michigan utilizing loading diagrams as provided in Section 1900 of the Specifications. The shoring system design computations shall be sealed by the Engineer who prepared them and forwarded to the Owner for review.
- C. Sheeting, bracing and timbering shall be so placed as to allow the work to be constructed to the lines and grades shown on the drawings.

Size and placing of members shall be subject to review by the Owner but the design of members and safety of the excavation shall be the responsibility of the Contractor.

Exact areas to be sheet piled and final weight of sheet piling shall be determined by the Contractor unless otherwise indicated for permanent sheet piling. Actual quantity and location of all sheet piling required for this project shall be determined by the Contractor.

- D. The Contractor shall select hammer or hammers to be used on sheet piling based on length, weight, type of pile, and depth of penetration and submit data on the hammer selected to the Owner for review. Double-acting hammers may be used on sheet piling.

Approximate weight of hammer shall be 2-1/2 times the weight of a sheet of piling to be driven.

- E. Sheet piling shall be driven to depths and lengths required by the Contractor unless otherwise indicated for permanent sheet piling. Level measurements, utilizing previously specified bench marks, shall also be made at existing structures, in the presence of the Owner's designated representative, during all driving of sheet piling to record any change in the level of present structures or utilities caused by the Contractor's Operations.
- F. Permanent sheet piling where indicated on the drawings shall be of weight, area and depth shown on the drawings and shall remain in place.
- G. Temporary sheet piling may not be withdrawn from any area until concrete within the zone influenced by vibrations set up by withdrawal operations, has attained its 28 day design strength.
- H. If the sheeting and bracing cannot be removed without detriment to the finished structure or existing structures, then the sheeting and bracing shall be left in place temporarily or permanently as the Owner shall approve. Sheeting and bracing left in place permanently shall be cut off at the required level so as not to interfere with subsequent construction. The cost of materials left in place less the eliminated expense of removal work shall be paid as an extra. No extra payment shall be allowed for the cost of placing the material.
- I. All bracing used shall be so arranged as to place no stress on any portion of the completed work until such work shall have developed sufficient strength, as determined by the Owner. Any damage to any structures occurring through settlements, water or earth pressure, slides, cave-ins, or other causes shall be repaired by the Contractor at his own expense.
- All materials used for earth bracing or support shall be structurally sound, uniform in quality, and adequate in size and strength for the use intended.

3.5 BACKFILL AND COMPACTION

- A. It is the intent of these Specifications that backfill shall be so placed and consolidated that no appreciable subsequent settlement will occur.
- B. Backfill shall be placed in uniform layers not exceeding 12 inches in depth when measured loose and each layer shall be thoroughly compacted by tamping, sheepsfoot-roller, mechanical vibrators, or by other effective means approved by the Owner. All backfill in all areas shall be compacted to at least 95% of maximum density, at optimum moisture content as specified in MDOT Standard Specifications for Construction Controlled Density Method. Compaction by flooding will not be permitted.

The Owner shall have the right to reject any backfill material which when used in the work, does not accomplish the required compaction.

- C. The Contractor shall furnish all necessary assistance and test pits as required for the Owner to conduct compaction density tests.
- D. No backfill material shall be placed on areas where free water is standing or on frozen subsoil areas.
- E. Clean areas and excavations to be backfilled of all trash and debris before placement of backfill. In placing backfill, take special care to prevent any wedge action, eccentric loading, damage, or overloading of any adjacent structures, piping, and equipment by equipment used in compacting backfill material.
- F. Heavy equipment for spreading and compacting fill and backfill shall not be operated closer to a wall than a distance equal to the height of the fill or backfill to be placed. Power-driven hand operated equipment shall be used against walls and where space limits the use of heavy equipment.
- G. All excavations around the walls and other foundations, etc., shall be backfilled to meet Owner approval after all work has been inspected and approved. Backfill shall not be placed against walls until all supporting slabs are in place and have attained their design strength or as indicated on the structural drawings.
- H. If compaction tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to the Owner.
- I. Porous stone filters shall be furnished and installed where shown on the Drawings. Stone filters shall be encased in a drainage geotextile fabric as specified in Section 02202 of these specifications.

3.6 FINISH GRADING

- A. The Contractor shall grade the entire site as indicated on the drawings to a smooth and even grade, meeting existing grades and/or the grades indicated on the drawings.
- B. Excavated material suitable and approved for backfilling shall be stored on the site in areas approved by the Owner. Reusable topsoil that is displaced shall also be stored on the site in separate area from the backfill.
- C. Finish grade under gravel road areas and under paved areas shall be limited to 1/2 inch in 10 feet from true profile and shall be maintained until succeeding layer or surface course is placed.
- D. Finish grading shall slope uniformly to contour lines shown on the Drawings, and to meet existing adjacent levels. The Contractor shall grade all areas within his work site and provide slopes, shoulders, berms, and level surfaces defined according to existing and established grades. The work shall also include all adjacent areas disturbed by construction and as required by new pavement installation.
- E. The subgrade for all slabs and pavements shall be prepared so as to have as near as practicable a uniform density throughout the entire area. The subgrade shall be compacted to 95% maximum density at optimum moisture content, as specified under BACKFILL AND

COMPACTION herein, by rolling or by other approved methods. After being prepared, the subgrade shall be maintained until concrete or pavement has been placed thereon.

- F. If, through neglect or delay on the part of the Contractor, the earth at subgrade elevation becomes unsuitable for the support of the work to be constructed thereon, the Contractor shall excavate down to solid earth, and shall backfill to the required subgrade elevation with plain concrete, or other suitable material as required to meet the Owner's approval.

Soil found to be unstable in the subgrade shall, when required to meet the Owner's approval, be excavated to firm soil and replaced with MDOT Granular Material, Class II, as specified above thoroughly compacted. Subgrade area supporting structures shall have unstable material replaced with Owner approved concrete.

END OF SECTION

SECTION 02990

PERMITS

PART 1 GENERAL

1.1 GENERAL

- A. A list of permits that have been applied for or may be required for this project is provided herein for the Contractor's reference. The Contractor shall secure, at no cost to the Owner, any additional permits and licenses necessary for the prosecution of the work. The Contractor shall keep himself fully informed of all laws, ordinances, and regulations in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over the same.
- B. The Contractor shall at all times observe and comply with, and shall cause all his agents and employees to observe and comply with all existing and future laws, ordinances, regulations, orders, and decrees. Provided that if the Drawings and Specifications are at variance therewith, the Contractor shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in the Contract Documents.

1.2 PERMITS

- A. The following permits have been applied for at no cost to the Contractor.
 - 1. MDEQ Part 41 Wastewater Construction Permit
- B. The Contractor shall apply for following permits (if required).
 - 1. Building/Electrical/Mechanical Permits
 - 2. Soil erosion control permit.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 03930

CONCRETE REPAIR AND REHABILITATION

PART 1 GENERAL

1.1 Summary

- A. Section Includes: Furnishing of materials, labor, tools, and equipment necessary to repair, patch, and restore poorly placed or deteriorated concrete; and repair of joints and reinforcing steel. This includes removal of deteriorated concrete, surface preparation and installation of repair materials at deteriorated areas, cracks, and joints in concrete floors, walls, and ceilings as indicated on the drawings and specified herein.

1.2 Related Work Specified Elsewhere.

- A. Section 01 1100, Summary of Work
- B. Section 01 3400, Submittals
- C. Section 01 7700, Contract Close-Out
- D. Section 03 3000: Cast-In-Place Concrete

1.3 Reference Standards

- A. ASTM C 109, Test Method for Compressive Strength of Hydraulic Cement Mortars.
- B. ASTM C 157, Test Method for Length Change of Hardened Cement Mortar and Concrete.
- C. ASTM C 882, Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete.
- D. ASTM D 412, Test Methods for Vulcanized and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
- E. ASTM D 624, Test Methods for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- F. ASTM D 903, Test Methods for Peel or Stripping Strength of Adhesive Bonds.
- G. ASTM D 3359: Standard Test Methods for Measuring Adhesion by Tape Test.
- H. SSPC-SP13/NACE No. 6 Surface Preparation of Concrete.

1.4 Submittals

- A. Submit manufacturer's data completely describing concrete repair materials for each type of product to be utilized in the concrete repair process. Include material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application

instructions. Submittals shall include a written statement from the Contractor that all products are compatible with each other, and consistent with the warranty requirements of the project.

- B. Concrete Rehabilitation Qualifications:
 - 1. Submit the name and experience record of the concrete rehabilitation Contractor. Include a list of at least 5 of the Contractor's previous utility or industrial installations rehabilitated, and identify the responsible officials, architects and engineers concerned with the project, contact information, and approximate contract price.
- C. Rehabilitation program: For each phase of the rehabilitation process, including protection of surrounding materials and site during operations, describe in detail the materials, methods, equipment and sequence of operations to be used for each phase of the work.

1.5 Quality Assurance

- A. Manufacturer Qualifications: The manufacturer of the specified product shall have been in existence, for a minimum of 10 years.
- B. Installer Qualifications: Work must be performed by a firm having not less than 5 years successful experience in comparable concrete repair and rehabilitation projects and employing personnel skilled in the restoration process and operations indicated.
- C. Source limitations: Obtain concrete patching and rebuilding materials, crack injection materials, corrosion inhibitors, sealants, all through one source from a single manufacturer.
- D. Construction Tolerances: Construction tolerances shall be as specified in Section 03301, Cast-In-Place Concrete, except as modified herein and elsewhere in the Contract Documents.
- E. Mockups: Install mockups for each type of concrete removal and patching, concrete repair, crack injection, and joint sealing to demonstrate the quality of materials and execution for approval by the Engineer.
 - 1. Approved mockups may become part of the completed work if undisturbed at time of substantial completion.
 - 2. The independent testing agency, or other inspection party representing the Owner, shall be present during the construction of the mockups.
 - 3. Quality Control testing, as required by this Specification, shall be performed on each mockup.
- F. Pre-installation conference: Prior to beginning any concrete repair or rehabilitation work, the Contractor shall meet with the Engineer to thoroughly discuss the proposed work, techniques and schedule. Representatives of the Manufacturer and Installer of repair and rehabilitation materials, as well as the independent testing agency, shall attend the pre-installation conference.

1.6 Delivery, Storage and Handling

- A. Deliver the specified product in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers.
- B. Store and condition the specified product as recommended by the Manufacturer.

- C. Store in a suitable location approved by the Engineer at all times. Keep area clean and accessible. Comply with health and fire regulations including the Occupational Safety and Health Act of 1970.
- D. Handle materials carefully to prevent inclusion of foreign materials.
- E. Do not open containers or mix components until necessary preparatory work has been completed and application work will start immediately.

1.7 Project/Site Conditions

- A. Existing Conditions:
 - 1. Hot Weather: ACI 305
 - 2. Cold Weather: ACI 306
 - 3. Do not place concrete repair mortar during precipitation unless adequate protection is provided.
 - 4. Coordinate coatings application with other trades to assure adequate illumination, ventilation, and dust-free environment during application and curing of coatings.
 - 5. Maintain a safe work environment in accordance with Federal, State, Local and project site regulations and guidelines.

PART 2 PRODUCTS

2.1 Manufacturers

- A. Sika Corporation.
- B. Or Equal, approved by the Engineer.

2.2 Materials

- A. Repair Mortar: SikaTop 122 Plus or SikaTop 123 Plus by the Sika Corporation or equal, approved by the Engineer.
- B. Exposed Rebar Repair and Scrub Coats: SikaTop Armatec 110 EpoCem as manufactured by Sika Corporation or equal, approved by the Engineer.
- C. Cementitious Coating: Sikatop 144 by Sika Chemical Corporation or equal, approved by the Engineer.
- D. Non-structural Crack Injection: Hydrophilic polyurethane chemical grout, SikaFix HH by Sika Chemical Corporation or equal, approved by the Engineer.
- E. Structural Crack Injection: Sikadur 35, Hi-Mod LV and Sikadur 31, Hi-Mod gel by Sika Chemical Corporation or equal, approved by the Engineer.
- F. Joint sealants: Polyurethane elastomeric sealant, Sikaflex-2C, by Sika Chemical Corporation or equal, approved by the Engineer.

2.3 Product Performance

A. Repair Mortar:

1. Repair mortar shall be a prepackaged cement based product specifically formulated for the repair of concrete surface defects. The repair mortar shall be a two-component polymer-modified, Portland cement, fast setting, trowel-grade mortar. The repair mortar shall be enhanced with a penetrating corrosion inhibitor. It shall have the following properties:

| <u>Physical Property</u> | <u>Value</u> | <u>ASTM Standard</u> |
|--------------------------------|--------------|----------------------|
| Compressive Strength (Minimum) | | C 109 |
| At 1 Day | 2000 Psi | |
| At 28 Days | 6000 Psi | |
| Bond Strength (Minimum) | | C 882* |
| At 28 Days | 1800 Psi | |

*Modified for Use with Repair Mortars.

2. Where the least dimension of the placement in width or thickness, exceeds 4 inches, the repair mortar shall be extended by addition of aggregate as recommended by the manufacturer.

B. Exposed Rebar Repair: The exposed reinforcing repair system shall consist of two components, a first application of a corrosion inhibitor and then a final application of a protective slurry mortar:

1. Corrosion Inhibitor: The corrosion inhibitor shall penetrate the hardened concrete surface and form a protective layer on the reinforcement. It shall have the following properties:
 - a. The product shall not change the substrate's color, appearance, or texture.
 - b. Penetration (SNMS Analysis): 1/10 to 4/5 inches/day.
 - c. Coating thickness (XPS and SIMS Analysis): 100-1000 angstroms.
 - d. Corrosion Current Reduction (ASTM G109 Cracked Beam Test): 65% at 1 year.
 - e. Chloride Displacement (XPS and SIMS Analysis): Passes.
 - f. Effectiveness in Carbonated Conditions (Electrochemical): Passes.
 - g. The product must not form a vapor barrier.
 - h. The product must be environmentally sound.
 - i. Post-application verification (Chromatography Plate Test): Passes.
 - j. Longevity (10 Year Accelerated Weather Testing): Passes.
2. Protective Slurry Mortar:
 - a. Protective slurry mortar shall be a two-component, polymer-modified, cementitious waterproofing, and protective slurry mortar. Provide two coats at a rate of 50 sq. ft./gal./coat.

- C. Cementitious Coating:
 - 1. Cementitious Coating: Provide a polymer-modified, 2 component, cementitious coating which is specifically designed to be a fine-textured, abrasion-resisting coating, and for dampproofing/waterproofing.

- D. Non-structural Crack Repair:
 - 1. Hydrophilic polyurethane chemical grout.
 - 2. Shrinkage limit shall not exceed 4.0 percent in accordance with ASTM D1042.
 - 3. Minimum elongation of 250 percent in accordance with ASTM D3574.
 - 4. Minimum tensile strength of 150 psi in accordance with ASTM C3574.

- E. Structural Crack Repair:
 - 1. Epoxy for injection shall be low-viscosity, high-modulus moisture insensitive type.

- F. Joint Sealant:
 - 1. Polyurethane elastomeric sealant, with expansion joint filler material and backer rod in accordance with Section 03301.

PART 3 EXECUTION

3.1 Examination

- A. The Contractor shall examine areas and conditions under which repair Work is to be installed and notify the Engineer in writing of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

- B. Notify Engineer seven days in advance of dates when areas of deteriorated or delaminated concrete and deteriorated reinforcing bars will be located.

- C. 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 indicated on the Plans and rehabilitation details. At walls, make boundaries level and plumb, unless otherwise indicated.

- D. Locate at least three reinforcing bars using a pachometer, and drill test holes to determine depth of cover in removal areas using pachometer. Calibrate pachometer, using depth of cover measurements, and verify depth of cover in removal areas using pachometer.

3.2 Preparation

- A. Surface Preparation:
 - 1. The entire area to be repaired shall have all laitance, foreign material, and unsound concrete removed by chipping and/or abrasive blasting or hydroblasting. The surface shall be further roughened as specified herein. Where non-shrink grout or repair mortar is used, any additional surface preparation steps recommended by the manufacturer shall be performed.
 - 2. Where repair concrete, shotcrete, or cement grout is used, and a bonding agent is not required, or where the repair mortar or non-shrink grout manufacturer recommends a

wet or saturated surface, water shall be delivered to the surface continuously for a minimum of 4 hours. Where large surface areas are to be repaired, fog spray nozzles mounted on stands shall be provided in sufficient numbers such that the entire surface to be repaired is in contact with the fog spray cloud. The concrete shall be prevented from drying until after the repair operation is completed. Unrepaired surfaces shall be rewetted by water spray on at least a daily basis. Should more than 4 days to be elapsed without rewetting the unrepaired surfaces, the original saturating procedure shall be repeated. All standing water in areas to be repaired shall be removed prior to placement of repair material. Means to remove excess water from the structure shall be provided.

3. Where the repair material manufacturer recommends the use of an epoxy bonding agent, the recommendations of both the repair material and bonding agent manufacturers shall be followed.
4. Care shall be taken to fully consolidate the repair material, completely filling all portions of the area to be filled.
5. The repair surface shall be brought into alignment with the adjacent existing surfaces to provide a uniform, even surface. The repair surface shall match adjacent existing surfaces in texture and shall receive any coatings or surface treatments which had been provided for the existing surface.

B. Curing:

1. Curing of repair mortar and non-shrink grout shall be according to the manufacturer's recommendations except that the minimum cure period shall be 3 days.
2. Curing of other materials shall be according to Section 03 3000, Cast-in-Place Concrete.

3.3 Treatment of Surface Defects

A. Surface defects are depressions in a concrete surface which do not extend all the way through the member. The depressions can result from the removal of an embedded item, the removal of an intersecting concrete member, physical damage, unrepaired rock pockets created during original placement, or spalls from corroded reinforcing steel or other embeds.

B. Preparation:

1. All loose, damaged concrete shall be removed by chipping to sound material.
2. Where existing reinforcing bars are exposed, concrete shall be removed to a minimum of one inch all around the bars. If the existing bars are cut through, cracked, or the cross-sectional area is reduced by more than 25 percent, the Engineer shall be notified immediately.
3. The perimeter of the damaged area shall be score cut to a minimum depth of 0.5 inch and a maximum depth so as to not cut any existing reinforcing steel. Existing concrete shall be chipped up to the score line so that the minimum thickness of repair mortar is 0.5 inch.

C. Repair Material:

1. Repair of surface defects in members which are normally in contact with water or soil or in the interior surfaces of enclosed chambers which contain water shall be made only with repair mortar.
2. Repair of other surface defects may be by the application of repair mortar, repair concrete, shotcrete, or cement grout, as appropriate.

3.4 Repair of Deteriorated Concrete

- A. This section pertains to concrete which has been damaged due to corrosion of reinforcing steel, physical damage due to abrasion, and damage due to chemical attack. The only material acceptable for surface repair is repair mortar as specified herein.
- B. Surface Preparation:
1. All loose, broken, softened, and acid contaminated concrete shall be removed by abrasive blasting and chipping down to sound, uncontaminated concrete.
 2. When the removal of deteriorated concrete is completed, the Contractor shall notify the Engineer. Two weeks shall be scheduled for the Engineer to inspect the surface, perform testing for acid contamination, determine if additional concrete must be removed, and to develop any special repair details that may be needed. Should it be determined that additional concrete must be removed to reach sound, uncontaminated material, another two-week period shall be scheduled for further evaluation after the end of the additional removal.
 3. Additional surface preparation shall follow the recommendations of the repair mortar manufacturer.
 4. Isolated areas of exposed reinforcing bars shall be treated as required for repair of surface defects. If extensive areas of reinforcement are uncovered after removal of deteriorated concrete, repair methods shall be as determined by the Engineer.
- C. Repair Mortar Placement:
1. The procedures recommended by the manufacturer for the mixing and placement of the repair mortar shall be followed.
 2. After the initial mixing of the repair mortar, additional water shall not be added to change the consistency should the mix begin to stiffen.
 3. Repair mortar shall be placed to a minimum thickness as recommended by the manufacturer, but not less than 0.50 inch. Where removal of deteriorated concrete results in a repair thickness of less than 0.5 inch to return to original concrete surface location in isolated areas totaling less than 10 percent of the total repair area, additional concrete shall be removed to obtain the 0.5-inch thickness. Where the area with repair thickness of less than 0.5 inch exceeds 10 percent of the total repair area, notify the Engineer. In any case, repair mortar shall be added so that the minimum cover over existing reinforcing steel is 2 inches. The Contractor shall not place repair mortar so as to create locally raised areas. Where there is a transition with wall surfaces which are not in need of repair, the repair mortar shall not be feathered at the transition. A score line shall be sawcut to not less than the minimum repair mortar depth and concrete chipped out to it to form the transition. Care shall be taken to not cut or otherwise damage any reinforcing steel.
 4. The repair mortar shall be placed to an even, uniform plane to restore the member to its original surface. Tolerance for being out of plane shall be such that the gap between a 12-inch straight edge and the repair mortar surface does not exceed 0.125 inch and the gap between a 48-inch straight edge and the repair mortar surface does not exceed 0.25 inch. This shall apply to straight edges placed in any orientation at any location.
- D. Finishing:
1. The repair mortar shall receive a smooth, steel trowel finish.

2. When completed, there shall be no sharp edges. All exterior corners, such as at penetrations, shall be made with a one-inch radius.

E. Curing:

1. Curing shall be performed as recommended by the repair mortar manufacturer except that the cure period shall be at least 24 hours and shall be by means of a continuous fog spray.

3.5 Exposed Rebar

- A. The entire area to be repaired shall have all corrosion, foreign materials, and unsound concrete removed by means of abrasive blasting or hydroblasting.
- B. Surface shall be visually dry before application of the corrosion inhibitor. The corrosion inhibitor shall be placed liberally to achieve 100 sq ft/gal coverage in two or more coats by allowing it to soak into the substrate. The waiting time between coats is a minimum of one hour. Apply by use of rollers, brushes, or hand-pressure spray equipment.
- C. After the last coat of the corrosion inhibitor is applied, a minimum curing time of 24 hours is required.
- D. High Pressure Wash all surfaces to remove filmy residue which is left on the surface by the corrosion inhibitor. Residue acts like bond breaker and must be removed before mortar coating.
- E. For repair mortar coating, refer to sections 3.4.B , Repair Mortar Placement, 3.4.C, Finishing, and 3.4.D, Curing.

3.6 Cementitious Coating

- A. Surfaces to be repaired shall have all laitance, foreign material, and unsound concrete removed by chipping and/or abrasive blasting or hydroblasting.
- B. Follow all other surface preparation and application specifications as recommended by manufacturer.

3.7 Crack Injection

- A. Perform injection grouting of fractured concrete using drilled hole packer injection techniques.
- B. Clean all areas to receive capping adhesive at cracks free of loose matter including soil, laitance, oil, grease, salt, and any other contaminants. Tight cracks (0.016" or less) shall be chiseled and thoroughly cleaned.
- C. Install injection ports on each side of the crack at regular intervals as recommended by the manufacturer, spacing no farther apart than the thickness of the member being injected. The ports shall be installed on a 45-degree angle that intersects the crack below the concrete surface.

- D. Prior to injection, a surface capping adhesive shall be applied to the concrete surface over the entire length of the crack.
- E. Sequentially inject each port by filling, under pressure, with crack repair material until the material begins to flow from the next port. The first port shall be capped, and injection should commence in the second port. The sequence shall continue until the entire crack has been filled.
- F. After curing, the injection ports and surface sealing material shall be removed and ground flush with the adjacent concrete surface.

3.8 Joint Sealant Replacement

- A. Failed movement joints shall include preparation of the existing joint and installation of new, 2-component polyurethane sealant as follows:
 - 1. Remove existing sealant, backer material, and joint filler material to approximately two inches below the existing concrete surface. Clean joint free of dirt, debris, laitance, and unsound concrete using high pressure blasting. Follow all other surface preparation and application specifications as recommended by manufacturer.
 - 2. Route existing joint or crack by grinding to provide clean sound surface for bonding of sealant.
 - 3. Install new closed cell foam backer rod.
 - 4. Install joint sealant.

3.9 Field Quality Control

- A. The Owner will employ a qualified testing laboratory to document installation procedures, quality, and extent of each repair performed, including sampling materials and performing tests as described herein. The Engineer will direct the number of tests and specimens required. The Owner's testing laboratory will make standard compression test specimens as specified below. The Contractor shall furnish all necessary assistance required by the Engineer. The Contractor shall furnish all necessary storage, curing, and transportation required by the testing.
- B. Field tests of cement-based grouts and repair mortar:
 - 1. Compression test specimens will be obtained during construction from the first placement of each type of mortar or grout, and at intervals thereafter as selected by the Engineer to insure continued compliance with these specifications. The specimens will be made by the Engineer or its representative.
 - 2. Compression tests and fabrication of specimens for repair mortar and non-shrink grout will be performed as specified in ASTM C 109. A set of three specimens will be made for each test. Tests shall be made at 7 days, 28 days, and additional time periods as appropriate.
 - 3. All material, already placed, which fails to meet the requirements of these specifications, is subject to removal and replacement at no cost of the Owner.
 - 4. The cost of all laboratory tests on mortar and grout will be borne by the Owner, but the Contractor shall assist the Engineer in obtaining specimens for testing. However, the Contractor shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications. The Contractor shall supply all materials necessary for fabricating the test specimens.

- C. Repair Concrete: Repair concrete shall be tested as required in Section 03 3000, Cast-in-Place Concrete.
- D. Crack Injection: Obtain and test core drill samples in accordance with Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete, ASTM C42, to verify proper installation. The cost of all laboratory tests core samples will be borne by the Owner, but the Contractor shall provide labor and equipment necessary to obtain and provide core-drilled samples to Owner, at no additional cost.
 - 1. Testing frequency: 3 samples from mockup and 1 sample for each 200 feet of crack injected.
 - 2. Where samples are taken, fill holes with epoxy mortar.
- E. Joint Sealant: Obtain and test core drill samples in accordance with Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete, ASTM C42, to verify proper installation. The cost of all laboratory tests core samples will be borne by the Owner, but the Contractor shall provide labor and equipment necessary to obtain and provide core-drilled samples to Owner, at no additional cost.
 - 1. Testing frequency: One sample for each 500 ft of joint filled.
 - 2. Where samples are taken, fill holes with joint filler.

3.10 Defective Tests

- A. If, in the opinion of the Engineer, the field quality control testing indicates that the Work fails to meet specification requirements or is otherwise unsatisfactory, then the Contractor shall perform additional sampling and testing as necessary to clearly identify the limits of the defective work to the satisfaction of the Engineer. At a minimum, this shall include two additional samples and tests for each failed or unsatisfactory test or inspection. The location and quantity of additional samples shall be approved by the Engineer. Following satisfactory additional sampling and testing, the defective work shall be repaired to the satisfaction of the Engineer, within the limits of the defective work, as defined by the length or area between satisfactory test samples.
- B. Additional testing of materials or concrete occasioned by their failure by test or inspection to meet specification requirements shall be at the expense of the Contractor.
- C. If, before testing, one or more samples shows evidence of having been damaged subsequent or during removal from the structure, it shall be replaced at no additional cost to the Owner.

END OF SECTION

SECTION 09900

PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation and field application of paints and coatings.
- B. New surfaces and construction shall be painted. Existing surfaces and areas shall be painted as called for on the Drawings.

1.2 REFERENCES

- A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. AWWA (American Water Works Association) - D102-17 - Painting Steel Water Storage Tanks.
- C. International Concrete Repair Institute (ICRI) Guideline No. 310.2-R2013 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
- D. NACE (NACE International) -Industrial Maintenance Painting.
- E. SSPC (SSPC: The Society for Protective Coatings) SSPC Painting Manual Volumes 1 and 2.
- F. NAPF (National Association of Pipe Fabricators) Section 500 Surface Preparation Standards.

1.3 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this Section.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data on all products and special coatings. Data shall include manufacturer's suggested surface preparation and coating thicknesses.
- C. Samples: Submit two samples, 1 x 3 inch (25 x 76 mm) in size illustrating range of colors and textures available for each surface finishing product scheduled.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures, substrate conditions requiring special attention, environmental considerations and any restrictions regarding time recoat.
- E. A letter certifying the installer as a Manufacturer's Approved Installer shall accompany the submittal package.

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- F. Daily Coating Inspection Reports (blank version included at the end of this Section) are to be submitted weekly to Architect/Engineer. One report is to be completed for each day of painting activity performed on the job site. Reports must be fully filled out. Payment may be withheld if reports are not submitted in a timely fashion or are not fully completed.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section and one of the companies listed.
- B. Applicator: Company specializing in performing the work of this section with minimum ten years, approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- C. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- D. Only materials approved for use on this project shall be delivered to the site.
- E. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.
 - 1. Any material found on the project that is stored in areas that are outside of the above temperature requirements shall not be used on the project and shall immediately be removed from the site.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the coating product manufacturer.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- C. Minimum Application Temperatures for Latex Paints:
 - 1. Minimum application temperatures shall be as required by the coating manufacturer's instructions.
 - 2. If there are no explicit printed recommendations by the manufacturer, minimum temperature of the air and surface to be painted shall be 50° Fahrenheit.
- D. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface during coating operations in the area being painted.
- E. Provide adequate ventilation at all enclosed spaces. Additional ventilation may be required to prevent fumes from affecting adjacent Owner-occupied spaces.

1.8 SURFACES NOT REQUIRING PAINTING

- A. Aluminum (except for backcoating as specified in Section 3.2F).
- B. Stainless Steel.
- C. Copper.
- D. FRP.
- E. PVC, CPVC, HDPE and Fiberglass Pipe and Ductwork (including hangers), unless noted otherwise.
- F. PVC Coated Electrical Conduit.
- G. Inside of pipe spaces, duct shafts, and similar areas not exposed to view.
- H. Exterior galvanized grating or checkered plate need not be painted, except to meet MIOSHA requirements.

1.9 EXISTING PAINTED SURFACES

- A. Existing painted surfaces that will be affected by project activities are to be tested by the Contractor as part of this work scope to determine if they contain lead. Any lead-based paint at affected areas are to be removed and abated in accordance with all federal, state and local regulations and guidelines as part of this work scope. Provide documentation of compliance methods to Owner for record as part of submittals.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers - Paint and Special Coatings
 - 1. Tnemec Company
 - 2. Carboline Company
 - 3. Sherwin-Williams Company
- B. Substitutions: No substitutions are allowed.
- C. All products used on this project shall be from the same manufacturer unless written approval is received from the Engineer.

2.2 MATERIALS

- A. Coatings:
 - 1. Ready mixed, except field catalyzed coatings.
 - 2. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.
- B. Accessory Materials:

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1. As recommended by the manufacturer and required to achieve the finishes specified, of commercial quality.

- C. Patching Materials:
 1. Latex filler.

2.3 FINISHES

- A. Refer to schedule at end of section for surface finish schedule.
- B. Colors will be selected by the Owner from color samples submitted.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of the General Conditions.
- B. Verify that surfaces and/or substrate conditions are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Commencement of the coating operations will signify acceptance of the substrate(s) as being suitable for the coating and ability to achieve the final results specified.
- E. Test shop applied primer for compatibility with subsequent cover materials.
- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 1. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 2. Concrete Floors: 8 percent. Test concrete for moisture in accordance with ASTM F 2170.

3.2 PREPARATION

- A. Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- B. Correct defects and clean surfaces which affect work of this section.
 1. Remove existing coatings that exhibit loose surface defects.
- C. Marks:
 1. Seal with a stain-blocking primer marks which may bleed through surface finishes.
- D. Mildewed Surfaces:
 1. Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach.
 2. Rinse with clean water and allow surface to dry.

- E. Aluminum Surfaces shall be backcoated with an Owner approved epoxy/sealer (Tnemec Series N69 or Carboline Rustbond penetrating sealer; or Sherwin-Williams Macropoxy 646) prior to installation to provide separation of dissimilar materials.
1. Contractor shall note that all dissimilar materials shall be kept from direct contact by the use of approved insulating and isolating materials.
 2. All surfaces shall be clean and if necessary treated with Clean'n Etch, Great Lakes Laboratories – Livonia, Michigan.
- F. Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint Finish:
1. Remove foreign particles to permit adhesion of finishing materials.
 2. Apply compatible sealer or primer.
- G. Insulated Coverings: Remove dirt, grease, and oil from surfaces.
- H. Fiberglass, PVC, CPVC or HDPE piping and connected items as shown on the drawings shall remain unpainted.
1. However, stenciled painted arrows, color bands, etc. shall be provided to agree with the Owner's Standard Color Code.
 2. Surface shall be lightly sanded below code markings prior to painting to obtain a roughened surface.
 3. Surface shall then be wiped with approved thinner solution.
 4. Markings shall then be applied as soon as the thinner has dried.
- I. Galvanized Surfaces Priming:
1. Galvanized surfaces scheduled for painting shall not be water quenched at the end of the galvanizing process.
 2. Remove gloss from the new spangled galvanizing by sweep blasting in accordance with the SSPC SP-16 – Brush Off Blast Cleaning of Coated or Uncoated Galvanized Steel, Stainless Steel and Non-Ferrous Metals.
 - a. Non-abrasive organic blasting media shall be utilized.
 - b. Environmental conditions shall be maximum 50% relative humidity and minimum piece and room temperature of 70 degrees F.
 3. Once prepared, galvanized surfaces are to be treated with Great Lakes Laboratories "Clean 'n Etch" in accordance with Manufacturer's requirements.
 4. Cleaned surfaces shall not remain overnight without a prime coat.
- J. Galvanized Surface Repair:
1. Damaged or welded galvanized areas shall have the galvanizing repaired in accordance with the current edition of ASTM A780.
 - a. Areas shall be repaired utilizing zinc-rich paints containing <80% zinc dust by weight of cured film.
 - b. Paint shall be stirred periodically in accordance with the manufacturer's recommendations to maintain the zinc in suspension.
 - c. The repair areas shall be painted with a brush, spray painting will not be allowed.
 2. Abraded galvanized areas shall be spot primed with a cold galvanizing compound, Tnemec 90G-1K97 Tneme-Zinc, Carbozinc 11 HSN Carboline, Sherwin-Williams Zinc Clad 5 (aerosol), or ZRC product with 95% pure zinc dust.
 3. Spot prime all abraded galvanized areas not primed by other trades, to present a complete, protected area, to receive finish coats.

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- K. Concrete and Unit Masonry Surfaces:
 - 1. Prepare all cementitious substrates referencing SSPC-SP13.
 - 2. Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter.
 - 3. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry.
 - 4. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water.
 - 5. Allow to dry.
 - 6. Application of block filler will be by roller or brush.
 - 7. Spraying will not be allowed.

- L. Ductile Iron:
 - 1. Remove grease, dirt, and other visible contaminants by washing with solvent (NAPF 500-03-01).
 - 2. Where mill scale, weld spatter, and rust are evident, remove by power tool wire brushing (NAPF 500-03-03) or where required, abrasive blast cleaning (NAPF 500-03-04 and 500-03-05).
 - 3. Spot prime paint after repairs.
 - 4. Actual surface preparation procedure shall be based on approved coating manufacturer's published recommendations.

- M. Shop Primed Steel Surfaces:
 - 1. Prepare surfaces per SSPC 2/3 hand or power tool cleaning. Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous.
 - 2. Clean surfaces with solvent.
 - 3. Prime bare steel surfaces.
 - 4. Prime metal items including shop primed items.

- N. Mechanical Equipment components to be field painted are to be pre-coated on site prior to assembly.

3.3 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.

- B. Apply each coat to uniform finish.

- C. Do not apply signs or pipe/equipment labels, etc. prior to installing coatings.

- D. Insulated pipe, fittings and equipment without an approved surface material or color shall be painted with 2 coats of Tnemec Series 115 Uni-Bond DF, Carboline Carbocrylic 3359, Sherwin-Williams Shercryl HPA which complies with the Color Code prescribed herein.

- E. Material labels and accompanying direction of flow arrows shall be applied to all distribution mains on maximum spacing of 50'.
 - 1. They shall be placed at those points on all main lines where branch mains are extended therefrom, and on the distribution mains at both sides of all solid building partitions.

2. Material labels and flow arrows shall be custom made for all piping systems governed by this contract, signifying the kind of material to be conducted and its direction of flow.
 3. All labels shall be self-adhesive and suitably coated to make them waterproof, and impervious to dirt.
 4. These labels shall have the identifying names superimposed on an Owner's approved background color in full or abbreviated, to meet the Owner's requirements and print the width of the label.
- F. Where letters and arrows cannot be applied to pipe lines, they shall be applied to metal panels, and in a manner to agree with identification listed in the Color Code.
1. Panels shall be 18 gage painted steel and hung on pipes every 50', near branch line connections and on either side of solid building partitions that pipes pass thru.
 2. On lines where there is flow in both directions, double arrows shall be used.
 3. On pipes where there is flow in one direction, single arrows shall be used.
- G. Substation equipment, control panels, panel boards, and other equipment specified to receive factory finish shall not be painted.
1. However, factory painted equipment which is chipped or defaced due to handling, installation or construction activities shall be refinished in a manner satisfactory to the Owner.
 2. This shall include glazing, sanding, and refinishing entire surface to a suitable boundary to avoid a patched effect.
 3. Suitable boundaries shall be changes in planes of surfaces such as corners, frames, mouldings, recesses, etc.
- H. Hazardous areas, moving machinery, handrails, and all other similar areas shall be finished to agree with the Owner's Standard Safety Code and all MIOSHA requirements, as approved by the Owner.
- I. Refer to Section 16195 for information on Electrical Identification requirements.
1. Refer to the end of this Section for color coding and identification banding of equipment, duct work, and piping.
- J. Paint shop primed equipment.
- K. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- L. Prime and paint exposed pipes, conduit, boxes, ducts, hangers, brackets, collars and supports.
- M. Paint dampers exposed behind louvers, grilles, to match face panels.
- N. Paint exposed conduit and electrical equipment occurring in painted areas.
- O. Paint both sides and edges of plywood backboards before installing equipment.
- P. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated.
1. Color band and identify with flow arrows and names, to match the existing installation.

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- Q. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FIELD QUALITY CONTROL

- A. Contractor shall refer to the SSPC Paint Inspection: Daily Coating Inspection Report that is a part of this section of the Specifications
 - 1. This report shall be filled out daily for every day that the painter is on site and working.
 - 2. The reports shall be filled out in their entirety as applicable for the work being performed.
 - 3. Provide multiple reports if necessary because the work for the day will include several coatings so each paint/coating type is properly documented.
 - 4. All reports shall be available to the Owner and the Owner's representative upon request at the site.
 - 5. Copies of these daily reports shall be submitted within (7) seven days from date of work for all painting and coating work performed on this project.
 - 6. Failure to submit reports in a timely fashion or deficient reports shall be reason to not approve the requested payment for the work.
- B. Field inspection and testing will be performed under provisions of Section 01400.
- C. Areas will be tested at random with dry film thickness gage.
 - 1. Any areas not meeting the minimum dry film thickness shown in the schedule or on approved Shop Drawing submittals shall have additional coats applied so the minimum dry film thickness is achieved.
 - 2. Each coat shall achieve the minimum dry film thickness specified, without regards to the overall system thickness.
- D. If an existing surface or area is not called out for painting but is defaced or damaged due to new Work under this Contract, then this surface or area shall be repainted to match adjacent areas, at no additional cost to the Owner.
 - 1. Repair areas shall be to a suitable area boundary as determined by the Engineer in the field.
 - 2. A repaired area may include an entire wall or the entire floor in a room or gallery.
 - 3. Patched effect repairs shall not be acceptable.

3.5 CLEANING

- A. Clean work under provisions of 01700.
- B. Collect waste material, place in closed metal containers and remove daily from site.
- C. Make good all damage done to floors and other work through neglect or carelessness or from failure to properly protect work from damage resulting from the execution of this work.

3.6 SCHEDULE - ALL INTERIOR AND EXTERIOR SURFACES

| Paint System | Surfaces |
|---------------------|---|
| 1 | Exterior Ferrous Metals, Piping and Equipment (Non-submerged) |
| 6 | Submerged Ferrous Mechanical Equipment Components and Piping |

- A. All painted walls, without applied base, shall be scribed 4" and painted with a 4" high, gloss black base.
 - 1. Material for base shall be compatible with the wall material.
- B. Aluminum Surfaces shall be backcoated with an Owner approved epoxy/sealer. Refer to Section 3.2.E of this Painting Specification.

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3.7 PAINTING - SYSTEMS
(Contractor shall refer to Products Section herein with regard to acceptable material manufacturers.)

- A. PAINTING SYSTEM NO. 1 – Exterior/Interior Ferrous Metals, Piping and Equipment
1. Surface Preparation, Ductile Iron Pipe – NAPF 500-03-04
 2. Surface Preparation, Ductile Iron Valves and Fittings – NAPF 500-03-05
 3. Surface Preparation, Galvanized Steel – SSPC-SP 16 and Clean ‘n Etch
 4. Surface Preparation, All Other Surfaces – SSPC-SP 6

| | Min. No. of Coats per Coating Layer | Product Name | Min. Total Thickness of Coating Layer Dry | Type |
|---|--|--------------------------------|--|---------------------------------|
| Primer | 1 | Tnemec Series N69 | 4.0 | Polyamide Epoxy |
| Intermediate | 1 | Tnemec Series N69 | 4.0 | Polyamide Epoxy |
| Finish | 1 | Tnemec 1095 Endura Shield | 3.0 | Aliphatic/ Acrylic Polyurethane |
| Primer | 1 | Carboline Carboguard 890 | 4.0 | Cycloaliphatic Amine Epoxy |
| Intermediate | 1 | Carboline Carboguard 890 | 4.0 | Cycloaliphatic Amine Epoxy |
| Finish | 1 | Carboline Carbothane 134 HG | 3.0 | Aliphatic Polyurethane |
| Primer | 1 | Sherwin-Williams Macropoxy 646 | 4.0 | Polyamide Epoxy |
| Intermediate | 1 | Sherwin-Williams Macropoxy 646 | 4.0 | Polyamide Epoxy |
| Finish | 1 | Sherwin-Williams Acrolon 218 | 3.0 | Aliphatic Polyurethane |
| <p>CONTRACTOR shall choose one of Primer-Intermediate-Finish systems listed above. Total Thickness of System – 11.0 Dry Mils Min. CONTRACTOR shall note curing times required between coats, per actual product used.</p> | | | | |

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B. PAINTING SYSTEM NO. 6 - Submerged Ferrous Mechanical Equipment Components and piping (non-potable) Surface preparation - SSPC-SP10

| | Min. No. of Coats per Coating Layer | Product Name | Min. Total Thickness of Coating Layer Dry | Type |
|---|--|--------------------------------|--|--------------------------|
| Finish | 1 | Hi-Build Tneme – Tar 46H - 413 | 18.0 | Coal Tar Polyamide Epoxy |
| Finish | 1 | Carboline Bitumastic No. 300M | 18.0 | Coal Tar Polyamide Epoxy |
| Finish | 1 | Sherwin-Williams Targuard | 18.0 | Coal Tar Polyamide Epoxy |
| CONTRACTOR shall choose one of Finish systems listed above. Total Thickness of System – 18.0 Dry Mils Min. | | | | |

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3.8 SCHEDULE -EQUIPMENT COLORS

| <u>EQUIPMENT</u> | <u>COLOR</u> |
|---------------------------------------|--------------------------------|
| A. Blowers | * |
| B. Compressors | * |
| C. Couplings | Yellow |
| D. Cranes (Hoists) | Yellow |
| E. Blocks | Yellow and Capacity in Black |
| F. Fans | Orange |
| G. Flow Meters | * |
| H. Gear Reducers | Yellow |
| I. Guards | Orange |
| J. Motors | Orange |
| K. Pumps | * |
| L. Screens | * |
| M. Switch Enclosure | Orange |
| N. Tanks | * |
| O. Valves | * |
| P. Valve Operators | Yellow |
| Q. Handrail/Guardrail | Orange ** |
| R. Handrail/Guardrail-Removable | Yellow & Black ** |
| S. Fire Protection Equipment | Red |
| T. Emergency Stop Bars, Buttons, Etc. | Red |
| U. First Aid Kits and Enclosures- | |
| a. containing First Aid Equipment | Green |
| V. Safety Showers, Face Washes, etc. | |
| a. (Area Around) | Green |
| W. Transformers | Orange |
| X. Switchgear | Grey or Buff |
| Y. Misc. Metal | Black (unless otherwise noted) |

- AA. * Color will depend on service. The color will be obtained from the "PIPE COLOR CODE" for the service. (No stripes used on equipment.)
- BB ** Brass, aluminum or stainless steel need NOT be painted.

The following colors shall be in conformity with the current ANSI Z553.1 as referred to by MIOSHA.

1. Red
2. Orange
3. Yellow
4. Green
5. Blue
6. Purple
7. Black
8. White

Note: Colors shall meet the tests specified in Section 3, Color Definitions, of the current ANSI/NEMA Z535.1

3.9 SCHEDULE -PIPING COLORS

| <u>SERVICE</u> | <u>COLOR</u> | <u>STRIPE</u> |
|------------------------------|----------------------------|---------------------------------|
| A. Potable Water – Cold | Green | |
| B. Potable Water – Hot | Green | Aluminum (1) |
| C. Emergency Shower Water | Green | Yellow (1) |
| D. Flushing Water | Gray | Blue (1) |
| E. Decant Water | Gray | White (1) |
| F. Industrial Water | Blue | |
| G. Ground Water | Blue | Green (1) |
| H. Instrument Air | Purple | Blue (1) |
| I. Natural Gas | Yellow | |
| J. Vacuum | Purple | Aluminum (1) |
| K. Roof Conductors | Match Background | |
| L. Floor Drains | Match Background | |
| M. Sump Pump Discharge | Gray | Black (1) |
| N. Sanitary Drains & Vents | Black | |
| O. Raw Sewage or Waste Water | Gray | |
| P. Sample Lines | Match System Being Sampled | |
| Q. Electrical Conduit | Match Background | |
| R. Stainless Steel | | 6" band with 3/4" stripes at 1" |
| S. Copper | | 6" band with 3/4" stripes at 1" |
| T. Plastic | | 6" band with 3/4" stripes at 1" |
| U. Low Pressure Air | per Owner | |
| V. Compressed Air | per Owner | |
| W. Grit | per Owner | |
| X. Sludge | per Owner | |

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END OF SECTION

**Paint Inspection:
Daily Coating Inspection Report**

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| Date: / / M T W Th F S Su | | Pg. Of | | | | |
| Project #: | | COPY To: | | | | |
| Inspector: | | <input type="checkbox"/> QC Mgr <input type="checkbox"/> Owner <input type="checkbox"/> Contr <input type="checkbox"/> _____ | | | | |
| Project/Client: | | Attachments: | | | | |
| Location: | | <input type="checkbox"/> DFT Sheet <input type="checkbox"/> NCR/CAR <input type="checkbox"/> _____ | | | | |
| Description: | | Revision # | | | | |
| Requirements: | | Spec # | | | | |
| Contractor: | | Revision # | | | | |
| Description of Areas & Work Performed | | Hold Point Inspections Performed | | | | |
| | | <input type="checkbox"/> 1 Pre Surface Prep/Condition & Cleanliness <input type="checkbox"/> 2 Surface Preparation Monitoring <input type="checkbox"/> 3 Post Surface Preparation/Cleanliness & Profile <input type="checkbox"/> 4 Pre Application Prep/Surface Cleanliness <input type="checkbox"/> 5 Application Monitoring/Wet Film Thickness (WFT) <input type="checkbox"/> 6 Post Application/Application Defects <input type="checkbox"/> 7 Post Cure/Dry Film Thickness (DFT) <input type="checkbox"/> 8 Nonconformance/Corrective Actions Follow-up <input type="checkbox"/> 9 Final Inspection | | | | |
| | | Approved By: _____ | | | | |
| Surface Conditions | | Ambient Conditions | | | | |
| <input type="checkbox"/> New <input type="checkbox"/> Maint <input type="checkbox"/> Primer/Paint <input type="checkbox"/> Age/Dry/Cure _____ <input type="checkbox"/> Steel <input type="checkbox"/> Galvanize <input type="checkbox"/> Concrete <input type="checkbox"/> Other _____ <input type="checkbox"/> Hazard _____ <input type="checkbox"/> Sample Report # _____ Degree of contamination: _____ Test: <input type="checkbox"/> Cl _____ µg/cm ² / ppm <input type="checkbox"/> Fe _____ ppm <input type="checkbox"/> pH _____ Degree of Corrosion: _____ <input type="checkbox"/> Scale <input type="checkbox"/> Pitting/Holes <input type="checkbox"/> Crevices <input type="checkbox"/> Sharp Edges <input type="checkbox"/> Weld _____ <input type="checkbox"/> Moisture <input type="checkbox"/> Oils <input type="checkbox"/> Other _____ <input type="checkbox"/> Painted Surface Condition: _____ Dry to: <input type="checkbox"/> Touch <input type="checkbox"/> Handle <input type="checkbox"/> Recoat <input type="checkbox"/> Dry/Over Spray <input type="checkbox"/> Runs/Sags <input type="checkbox"/> Pinholes <input type="checkbox"/> Holidays <input type="checkbox"/> Abrasion <input type="checkbox"/> Fall Out <input type="checkbox"/> Other _____ | | Time (Indicate AM or PM) : : : : Dry Bulb Temp ^o (C/F) : : : : Wet Bulb Temp ^o (C/F) : : : : % Relative Humidity : % : % : % : % Surface Temp ^o (C/F) Min/Max : / : / : / : / Dew Point Temp ^o (C/F) : : : : Wind Direction/Speed : : : : Weather Conditions: : : : : | | | | |
| Surface Preparation | | Application | | | | |
| Start Time: _____ Finish Time: _____ Est Sq/ft: _____ <input type="checkbox"/> Solvent Clean <input type="checkbox"/> Hand Tool <input type="checkbox"/> Power Tool <input type="checkbox"/> HP Wash PSI _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Abrasive Blast <input type="checkbox"/> Abrasive Type _____ <input type="checkbox"/> Sample <input type="checkbox"/> Blast Hose Size _____ <input type="checkbox"/> Nozzle Size / PSI _____ <input type="checkbox"/> Air Supply CFM _____ <input type="checkbox"/> Air Supply Cleanliness <input type="checkbox"/> Water/Oil Trap Check <input type="checkbox"/> Equipment Condition Check | | Start Time : _____ Finish Time : _____ Est. Sq/ft. _____ <input type="checkbox"/> Primer <input type="checkbox"/> Intermediate <input type="checkbox"/> Topcoat <input type="checkbox"/> Touch-up Generic Type: _____ Qty Mixed: _____ Manuf.: _____ Mix Ratio: _____ Prod Name: _____ Mix Method: _____ Prod #: _____ Strain/Screen: _____ Color: _____ Material Temp: _____ °F Kit Sz/Cond.: _____ Sweat-in Time: _____ Min/Hrs Shelf Life: _____ Pot Life: _____ Min/Hrs Batch #'s (A) _____ Reducer #: _____ (B) _____ Qty Added: _____ Pts/Qz/Gal (C) _____ % by Vol: _____ % Reducer: _____ Specified WFT Avg: _____ Mils <input type="checkbox"/> Airless/Conv. Spray <input type="checkbox"/> Brush <input type="checkbox"/> Roller <input type="checkbox"/> Other _____ Pump Pot _____ Hose Dia. _____ Air Check _____ Ratio/Size _____ Hose Lng. _____ SEP/Trap _____ GPM/CFM _____ Spray Gun _____ Filter _____ PSI _____ Tip Sz. _____ Agitator _____ | | | | |
| Surface Cleanliness & Profile Measurement | | | | | | |
| <input type="checkbox"/> Job Specification <input type="checkbox"/> SSPC/NACE - SP- _____ <input type="checkbox"/> SSPC/NACE Spec / Visual Stds <input type="checkbox"/> _____ Profile Check: _____ <input type="checkbox"/> Disc <input type="checkbox"/> Tape <input type="checkbox"/> Gauge <input type="checkbox"/> Specified _____ mils avg. / Achieved _____ mils <input type="checkbox"/> Surface effect on DFT Gauge/BMR _____ mils | | | | | | |
| Dry Film Thickness | | | | | | |
| Gage Type / Model | Gage Serial # | Gage Calib. Verified | Spec Avg. DFT | Total Avg DFT | DFT Last Coat | DFT This Coat |
| | | | | | | |
| Inspector's Signature | | | | | | Date |



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SECTION 11203

CLARIFIER LAUNDER COVERS

PART 1 GENERAL

1.1 DESCRIPTION

- A. The prefabricated covers shall effectively protect the clarifier effluent trough area and weir from the outside atmosphere. The cover system also shall eliminate the growth of algae on the launder and weir.
- B. The covers shall be designed to cover the clarifier launder and other equipment as shown in the contract drawings.
- C. Each cover system shall consist of the covers panels, access hatches, angles, brackets, gaskets, hardware, anchors and fasteners and other items necessary for complete FRP cover system.
- D. Effluent weirs and scum baffles are specified in Section 11204.

1.2 RELATED SECTIONS

- 1. Section 01300 – Submittals
- 2. Section 01400 – Quality Control
- 3. Section 01600 – Materials and Equipment
- 4. Section 01730 – Operation and Maintenance Data
- 5. Section 01800 – Training
- 6. Section 05520 – Handrails and Guards
- 7. Section 05525 – Aluminum Handrails and Guards
- 8. Section 11204 – Weirs and Baffles
- 9. Section 11336 – Final Clarifiers
- 10. Section 15000 – Equipment, General

1.3 SUBMITTALS

- A. Shop Drawings
 - 1. Manufacturer's catalog information, descriptive literature, specifications and identification of materials of construction, including resins and glass fiber content and layout for FRP constructions.
 - 2. Detailed drawings showing equipment fabrication, dimensions, method of attachment including number, locations and size of fasteners and weights of fabrications.
 - 3. Manufacturer's recommended Cover dimensions, mounting configuration and location for each application.
- B. Quality Control Submittals
 - 1. Manufacturer's Certificate of Compliance.
 - 2. Special shipping, storage and protection and handling instructions.
 - 3. Manufacturer's written/printed installation instructions.

- 4. Certify that the cover meets local building code specifications for wind load, including uplift and deflection.
- 5. Stamped calculations demonstration that the covers meet the specified loads.
- 6. Certified test reports of the physical and mechanical properties of the product.

1.4 WARRANTY

- A. Manufacturer shall expressly warrant the Launder Cover System to be free of defects in materials and workmanship for a period of one year from the date of substantial completion.

1.5 COORDINATION

- A. Manufacturer shall coordinate the Launder Cover design and installation requirements with the clarifier mechanism, scum box, overflow weirs, scum baffles and launder effluent channel configurations.

PART 2 PRODUCTS

2.1 SCOPE OF SUPPLY

| Quantity | Location | Clarifier Nominal Diameter | Portion to be covered |
|-------------------------|-----------------------------|--|---|
| Eight (8) Cover Systems | Final Clarifier No.'s 1 - 8 | See contract drawings for dimensions, field verify measurements. | Effluent launder, saw-tooth weir and scum baffles only. |

2.2 MANUFACTURERS

- A. Materials, equipment and components in this section shall be the products of NEFCO Systems, Incorporated. No other manufacturers will be considered.

2.3 DESIGN

- A. The Launder Cover shall consist of a system of molded fiberglass panels that are attached together to form a continuous cover over the launder trough, weir and scum baffle within the treatment tank. The Cover shall be designed and manufactured to inhibit incident sunlight from striking the surfaces of the launder and weir. Each Cover section shall be molded of UV-protected fiberglass and shall be opaque to sunlight. Individual sections shall be a minimum of four feet in length and curved to follow the curvature of the tank. The Cover shall extend over the trough and weir as far as possible and may extend to a point immediately inside the scum baffle so long as the Cover does not interfere with the sweep arm. The Cover shall be designed such that adjacent panels fit together properly and the completed Cover, when installed, forms a rigid structure and has a well-engineered and professional appearance.
- B. Provision shall be made to support the Cover in such a manner that the panels are held securely in place, with the panels hinged to provide access to the launder and weir for inspection and maintenance. Neither the Cover nor the means used to support it shall interfere with effluent flow over the weir or within the trough. Cover supports shall not impede

personnel from entering and traversing the launder. Cover supports that cantilever from the outer effluent launder wall without support at the weir wall are unacceptable.

- C. Launder cover panels shall have a curved or arched shape over the width of the launder trough with sufficient radius to strengthen the panel and minimize possible deflections against snow loads.
- D. The Cover shall be designed to open away from the operator and toward the center of the tank. Each Cover segment shall consist of a fixed Mounting Section and two (2) Cover Sections, each connected to the Mounting Section by a continuous stainless-steel hinge. The Mounting Section shall provide a rigid mount for the Cover Sections and ensure the proper fixed spacing between them.
 - 1. The Mounting Section shall be fastened to the weir wall with FRP and/or stainless-steel brackets and shall extend inward to a point just inboard of the scum baffle. The hinged Cover Sections shall extend outward toward the outer launder wall and swing open to allow inspection and maintenance of the launder and weir. The hinge point of the Cover is strategically positioned to maximize visibility of the launder and weir when the Cover is open. In the closed position, the Cover Sections rest on an FRP support flange attached to the outer launder wall.
- E. The hinged Cover sections shall be designed with a configuration that allows for alternate panels to open independently of every other panel. Alternate panels shall have an integral tab at both sides that rests on the adjacent panel and covers the seams between panels. The panels adjacent to a middle panel must be opened before the middle panel opens.
- F. Provision shall be made to secure the Cover in the closed position for safety and security. If the Cover opens toward the center of the tank, this is accomplished by means of an easily operated, spring-loaded latch mechanism that secures the hinged Cover Sections. If the Cover opens toward the outside of the tank, the Cover can be secured in the closed position by high strength magnetic latches mounted to the Cover resting brackets. Handles or lift rings may also be required for some panels. A means of limiting the travel of the hinged Cover sections, in the form of a restraint cable or tether, may also be provided to protect against damage. Covers with inspection hatches or cleanout doors are unacceptable.
- G. Where the circumference of the trough is interrupted by a bridge-support or another obstacle, a fixed panel(s) shall be installed over the trough beneath the support such that the surface of the Cover is continuous around the entire tank. Alternatively, vertical panels may be installed on both sides of the bridge supports to block out sunlight.
- H. The Cover system shall be designed to withstand common wind and snow loads but the entire Cover shall not be intended as a “walk-on” Cover designed to support the weight of plant personnel. Adequate stiffeners shall be integral to each panel, but panels reinforced with balsa or foam cores are not acceptable except where a single or double length reinforced walk-on section is used for safe entry to the launder.

2.4 MATERIALS

- A. Each Cover panel shall be molded of fiberglass, reinforced plastics. The resins and fiberglass reinforcing materials shall be consistent with the environmental conditions and structural requirements of the application.
- B. The resin shall be an industrial quality, isophthalic polyester resin with UV suppression additives, Corezyn COR75-AQ-010, or equivalent. The resin shall be pigmented to ensure that the resulting part is opaque. The glass reinforcement shall be chopped strand roving, 357-211 PLN CTC, or equivalent, with a minimum 1/2-inch strand length. Additional reinforcement in the form of stiffening ribs shall be added when necessary. The glass content of the finished laminate shall be not less than 30% by weight. The nominal thickness of each panel shall be 1/4 inch. The laminate shall consist of a 20 mil outer layer of marine quality white gelcoat, followed by chopped strand roving. The laminations shall be dense and free of voids, dry spots, cracks or crazes. All factory-trimmed edges shall be sanded and sealed. The finished laminate shall have a smooth, even appearance.
- C. Fasteners, handles, hinge and latches shall be stainless steel. The weir wall mounting brackets shall be stainless steel, FRP or a combination of the two. The latch/handle shall be a spring-loaded mechanism with a positive detent positioned to indicate the closed/locked position of the handle. The latch is activated by pressing down on the spring-loaded handle and turning it. The magnetic latch is disengaged by pulling upward on the cover, ring or other fixture with sufficient force to overcome the force of the magnet.
- D. The tether or restraint cable shall consist of a length of stainless steel cable secured to the tank wall and the hinged Cover Section by means of stainless steel eyebolts. The length of the cable is selected to limit the travel of the Cover.

2.5 FINISHES

- A. The exterior surface of the cover shall be a quality gel-coat surface that is corrosion-resistant and free from pits, porosity, or dry glass. The finish shall protect the FRP covers and materials from UV degradation.

2.6 ANCHOR BOLTS

- A. Anchor bolts and attachment hardware shall be of type 316 stainless steel.
- B. Provide all anchor bolts required for equipment furnished. Anchor bolts shall be type 316 stainless steel with ample strength for the intended service.
- C. Anchor bolt products and installation shall comply with anchorage notes on structural drawings.

PART 3 EXECUTION

3.1 GENERAL

- A. Manufacturer shall submit to the Engineer a certification that the cover system was manufactured in strict compliance to the specifications and meets or exceeds the requirements of the specification.
- B. Offload, store and install equipment in strict accordance with manufacturer's written instructions.

3.2 FIELD QUALITY CONTROL AND DEMONSTRATION

- A. Field verify all measurements as needed
- B. Upon completion of installation, the following inspection functions shall be performed by the installation contractor.
 - 1. The cover geometry shall match the circularity of the scum skimmer mechanism and shall not conflict with the mechanism
- C. Install the Cover in accordance with the contract drawings, manufacturing drawings and manufacturer's recommendations.

END OF SECTION

SECTION 11204
WEIRS AND BAFFLES

PART 1 GENERAL

1.1 GENERAL

- A. The Contractor shall furnish all labor, materials, tools, equipment, and supervision required to install the various weirs and baffles, as indicated on the Drawings and specified herein, and all other work incidental thereto, except as otherwise noted.
- B. The work shall be complete and ready for satisfactory operation whether or not each and every item is shown on the Drawings or specifically mentioned in these Specifications.
- C. The requirements of Section 15000, "Equipment, General" and Section 15030, "Piping Installation, General"; and all other applicable sections of the Specifications, form a part of this Section and govern work covered in this section.

1.2 REFERENCES

- A. ANSI/AWWA F102 – Matched Die-Molded, Fiberglass-Reinforced Plastic Weir Plates, Scum Baffles, and Mounting Brackets; American Water Works Association.
- B. ASTM D 256 – Standard Test Methods for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
- C. ASTM D 570 – Standard Test Method for Water Absorption of Plastics.
- D. ASTM D 638 – Standard Test Method for Tensile Properties of Plastics.
- E. ASTM D 696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degrees C and 30 degrees C.
- F. ASTM D 790 – Standard Test Methods for Flexural Properties of non-reinforce and Reinforced Plastics and Electrical Insulating Materials.
- G. ASTM D 2583 – Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

1.3 SUBMITTALS

- A. Shop drawings are required for each item in this Section. Shop drawings shall be as specified in Section 01300-Submittals.
- B. Product Data: Test results of fiberglass reinforced plastic laminate.
- C. Shop Drawings: Show:
 - 1. Critical dimensions, jointing and connections, fasteners and anchors.
 - 2. Materials of construction.

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3. Sixes, spacing, and locations of structural members, connections, attachments, openings, fasteners, and loads.

D. Manufacturer's installation instructions.

E. Final weir elevation confirmation check by Registered Surveyor.

1.4 RELATED SECTIONS

A. 11336 Influent and Effluent Launderers

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products indoors and protect from construction traffic and damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Provide products manufactured by NEFCO. No other manufacturers will be considered.

2.2 WEIR PLATES, SCUM BAFFLES, AND BRACKETS

A. Weir Plates, Scum Baffles, Brackets, and Plates: Fiberglass reinforced polyester resin, compression molded in matched metal die molds; provide all required lap plates, cover plates, and support brackets.

B. Fiberglass Laminate Construction:

1. Glass content of laminate; 20 percent plus/minus 3 percent by weight. Resin fillers: 40 percent +/- 2 percent of resin mixture.
2. Final laminate thickness: Plus/minus 10 percent of nominal specified thickness.
3. Tensile strength (ASTM D 638): 10,000 psi.
4. Flexural strength (ASTM D 790): 20,000 psi.
5. Flexural modulus (ASTM D 790): 800,000 psi.
6. Impact, notched, Izod (ASTM D 256): 10 ft-lb.
7. Barcol hardness (resin-rich surface) (ASTM D 2583): 35 minimum, average.
8. Water absorption (ASTM D 570): 0.2 percent at 24 hrs.
9. Coefficient of thermal expansion, ave. (ASTM D 696): 0.0000105 in/in/degree F.
10. Test coupons prepared in accordance with ASTM D 618.
11. Chemical resistance: Comply with ASNSI/AWWA F102, Type II classification.

C. V-Notch Weir Plates

1. ¼ inch nominal thickness.
2. Color: Green.
3. Height: 10 inches.
4. Notches: 2-1/2 inches deep by 90 degrees on 6 inch centers.
5. Length: Not to exceed 12 feet long, total length as shown on Drawings.
6. Mounting holes on round tanks: 2-1/2 inches square at 20 inches on center to provide a minimum 2 inches vertical or horizontal adjustment.

7. Mounting: ½ inch diameter stainless steel anchor bolts and 5 inch square fiberglass cover plates to prevent short circuiting of water.
8. Ends secured with lap plates to allow for horizontal expansion.
9. Provide stainless steel anchor bolts.

D. Scum Baffle Plates:

1. ¼ inch nominal thickness.
2. Color: Green.
3. Height: 15 inches. Ten feet on upstream side of scum trough, 24 inches.
4. Mounting holes: As required to attach to support brackets.
5. Lengths as required to suit project conditions, up to 12 feet maximum each.

E. Lap Plates:

1. Size: 6 by 12 inches.
2. Provide as required to secure ends of baffle plates.
3. Provide stainless steel hardware to secure baffle plates to support brackets and to lap plates.

F. Scum Baffle Support Brackets:

1. Provide at 40 inches on center for round tanks.
2. Size: 1/4 inch thick, 4 inches wide, minimum.
3. Slotted to allow at least 1-1/2 inches vertical and horizontal adjustment to compensate for inaccurate anchor bolt location.

G. Assembly Hardware:

1. Stainless steel, Type 304.
2. Provide hook anchors, expansion or adhesive, ½ inch by 6 inches by 2 inches.

PART 3 EXECUTION

3.1 EXAMINATION

- A. The Contractor shall field check and verify that dimensions are correct and project conditions are suitable for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install products in accordance with manufacturer's instructions.
- B. Ensure that products are installed plumb and true, free of warp or twist, within tolerances specified by the manufacturer and as indicated in the contract documents.
- C. Install in accordance with approved shop drawings and in true and proper alignment. Weir plates must be within a tolerance of ¼" of the stated elevation on the DRAWINGS for the entire circumference of each of the clarifiers. Independent verification of this final weir setting elevation shall be done by a Registered Surveyor for each of the clarifiers. Verification shall include entire circumference of weir.

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- D. Adjust weir plate elevation for flow indicated or as directed by the Engineer.
- E. When necessary to adjust lengths of plates due to field conditions and when approved by the Engineer, seal cut or machined edges thus exposed with polyester resin. Excessive cutting will not be acceptable.
- F. Provide suitable caulk as required to seal any leaks in the weir plates or between the weir plates and the stainless-steel face plate to prevent any leaks. Caulk to be suitable for immersion in water, all temperature outdoor exposure.

3.3 ADJUST AND CLEAN

- A. Clean surfaces in accordance with manufacturer's instructions.
- B. Remove trash and debris and leave the site in a clean condition.

WEIR & BAFFLE SCHEDULE

| | |
|--------------------------|--|
| Location: | Secondary Clarifier No's 1-8 |
| Number of Clarifiers: | 8 |
| Diameter of Weir Trough: | Clarifiers 1-4: 102'-8" (field verify existing tank dimension) Clarifiers 5-8: 115'-0" (field verify existing tank dimension) |
| Weir Type: | V-notch |
| Diameter of Scum Baffle: | Clarifier 1-4: 101'-4" (field verify existing tank dimension) Clarifier 5-8: 113'-4" (field verify existing tank dimension) |

END OF SECTION

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SECTION 11336

INFLUENT/EFFLUENT LAUNDERS

PART 1 GENERAL

1.1 SCOPE

A. Description of Work

1. Provide all labor, material and equipment to design, furnish and install influent and effluent launders on the existing clarifiers.
2. This specification covers the general requirements for the design, fabrication and installation of influent and effluent launders as shown on the Drawings.
3. The Base Bid price shall be painted steel and the Alternate 1 price shall be stainless steel for all the steel provided in this section.
4. The final thickness and design of the steel components and anchors shall be by the manufacturer to provide the basic dimensions given in the design DRAWINGS with the design criteria given in this specification.

B. Work and Components Included (But Not Limited To)

1. The Equipment Manufacturer shall furnish the items listed below for Battery A clarifiers 1 - 4:
 - a. Steel influent launders, target baffles and skirt baffle
 - b. Steel effluent launders and drop box.
 - c. All associated attachment bolts and anchor bolts for above.
 - d. All work as shown on the Drawings for a complete job.
2. The Equipment Manufacturer shall furnish the items listed below for Battery B clarifiers 5 – 8:
 - a. Steel influent target baffles
 - b. Steel effluent launders and drop box.
 - c. All associated attachment bolts and anchor bolts for above.
 - d. All work as shown on the Drawings for a complete job.
- 3.

1.2 Related Sections

1. Section 01300 – Submittals
2. Section 01400 – Quality Control
3. Section 01600 – Materials and Equipment
4. Section 03300 – Concrete Work
5. Section 09900 – Painting
6. Section 11203 – Launder Covers
7. Section 11204 – Weirs and Baffles
8. Section 15000 – Equipment, General

1.3 SUBMITTALS

- A. Operating instructions, manuals and shop drawings shall be submitted in accordance with Section 01300.
 - 1. Certified general arrangement and tank dimensional drawings. Each clarifier tank shall be individually field measured by the installing contractor prior to shop drawing submittal to confirm the existing dimensions/configuration.
 - 2. The shop drawings shall be stamped by a registered professional engineer, confirming the design requirements below.
 - 3. Shop drawings shall include:
 - a. Components fabricated off site and shipped to the site.
 - b. Component weights and assembly instructions
 - c. All fields welding details Gasket materials and placement and/or water tightness details
 - d. Bolt up or mechanical connection details
 - e. Thermal expansion joints or other considerations
 - f. Means of surface prep for coatings
 - g.

1.4 GUARANTEE AND WARRANTY

- A. The equipment shall be guaranteed to meet or exceed the design criteria detailed in Part 2 of this specification.
- B. All equipment shall be provided with a 12 month (12) warranty from the time of acceptance of the equipment

PART 2 PRODUCTS

2.1 MANUFACTURERS. Acceptable manufacturers for the equipment proposed include the following. No other manufacturers will be considered.

- A. Evoqua Water Technologies, Westech.
- B. No alternative manufacturers shall be used.

2.2 EQUIPMENT

- A. General
- B. Design Criteria
 - 1. Hydraulics shall be designed to handle (per clarifier):

| | MIN | AVE | PEAK |
|---------------------|-----|-----|------|
| Effluent Flow (MGD) | 2.0 | 4.0 | 10.0 |
| Return Flow (MGD) | 1.0 | 2.0 | 5.0 |
| Influent Flow (MGD) | 3.0 | 6.0 | 15.0 |

C. Structural Members

1. Structural steel to conform to ASTM A36 for the Base bid option.
2. Structural steel components shall have minimum thickness of 1/4".
3. All welding to conform to American Welding Society Standard AWS D 1.1 or AWS D1.6.
 - a. All field welding of A36 carbon steel shall be in accordance with AWS D 1.1.
 - b. All field welding of stainless-steel shall be in accordance with AWS D 1.6.
 - c. Details for field welding of stainless-steel effluent launders shall be followed in accordance with manufacturer drawings.
4. Design components so that stresses developed do not exceed allowable stresses, as defined by current AISC standards.
5. Panel lengths and member sizes shall be selected such that slenderness ratios do not exceed 200 for compression and 240 for tension. For strength, the controlling member force shall be used to determine member size.
6. Maximum deflection in a span under combined live and dead loads shall not exceed L/360.
7. The dead load design shall include each trough full of water with algae covers and weirs/scum baffles. Buoyancy design shall include the clarifier full of water and the troughs empty.
8. Design calculation shall assume a 10% section loss of material and anchors due to future corrosion degradation.

D. Influent/Effluent Launders

- a. Provide influent/effluent launders of minimum 3/16" thick AISI Type 304L welded stainless steel construction for the Stainless steel option.
- b. Provide influent/effluent launders of minimum of 1/4" thick A36 steel construction for the painted steel option.
- c. The launders shall be anchored to the concrete wall along the periphery of each tank.
- d. Design the effluent launders to serve as a collection trough for clean effluent and serve as a skirt baffle for the influent flow from the influent channels as shown on the DRAWINGS.
- e. All anchorages to concrete shall be made via stainless steel threaded rod anchored with an epoxy adhesive anchor system, HIT-HY 200 adhesive with HAS threaded rod and matching hardware (AISI Type 316 SS), by Hilti Corp or approved equal. Anchorage design shall be manufacturer to support the new steel troughs and shall use the following assumptions:
 - 1) Normal weight concrete
 - 2) Concrete strength, $f'_c = 3000$ psi
 - 3) Baseline concrete condition (as defined by ACI 318)- Cracked
 - 4) Use of appropriate reduction factors per manufacturer's specifications
 - 5) The manufacturer shall provide engineered sealed drawings for the anchorage design for all anchors to the existing structure.
- f. All launders shall be designed for a straight-weir plate fixed to the launder.

E. Effluent Weirs and Scum Baffles

1. Provided as specified in Section 11204
2. Coordinate installation to avoid conflict with mechanism installation

- F. Anchor Bolts
 - 1. All equipment anchor bolts shall be Type 316 stainless steel.
 - 2. Anchor bolts to comply with project notes on the structural contract drawings

- G. Coating and surface treatment
 - 1. All ferrous metal surfaces shall be painted steel in accordance with section 09900 for the base bid.
 - 2. All stainless steel components shall be mechanically treated in accordance with ASTM A380 for the Alternate bid.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to installation, offload and store equipment in accordance with manufacturer's written instructions.

3.2 INSTALLATION

- A. Equipment shall be installed in accordance with the Manufacturer's recommendations to provide complete installation.

- B. Each seam between effluent launder sections shall be seal welded upon installation to ensure full seal. All field welding procedures and personnel shall be in accordance with AWS D 1.6. Welding shall be performed by welders who have passed AWS qualification test for the applicable welding processes involved within the previous 12 months. Detail for field welding of effluent launder sections shall be provided by manufacturer.

3.3 EQUIPMENT MANUFACTURER'S SERVICE REPRESENTATIVE

- A. Installation/Startup Assistance
 - 1. Provide for installation assistance of a minimum of one trip to instruct the installing contractor in installation of each clarifier. Provide a minimum of one trips for startup of the clarifier and to confirm that the equipment has been installed in accordance with the manufacturer's requirements. Provide this installation check for each clarifier startup.

END OF SECTION

SECTION 15000
EQUIPMENT, GENERAL

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. The Contract Drawings and the general provisions of the specifications included in Division 0-Contract Provisions and Division 1-General Requirements, are a part of these Specifications. The Contractor shall consult them for instructions pertaining to the work.
- B. This section is comprised of standards of construction and materials for those divisions of these Specifications under which process and service equipment is provided and installed. The Contractor shall refer to the drawings to ascertain which systems he is required to provide. Construction methods and materials for special systems, not described in this section are specified under the detailed section to which they apply. Where more stringent construction methods are required than imposed by this section, they are specified in the detailed sections and shall apply.

1.2 WORK INCLUDED

- A. These specifications and the accompanying drawings are intended to comprise the furnishing and installing of all materials, equipment and supplies as specified herein and required for the satisfactory completion by the Contractor of all work including the installation of Owner furnished equipment.
- B. The drawings and these specifications are complementary to each other in that all apparatus, materials and equipment shown on the drawings and/or specified herein shall be considered essential to the contract requirements.
- C. The Contractor is responsible for all work shown on the drawings and all the systems described herein, unless otherwise shown on the drawings or specified herein.
- D. All apparatus and equipment furnished and installed by the Contractor must be of such dimensions and design as to be adapted to the arrangement of the installation and to fit within the limits of the space available for them.

1.3 SHOP DRAWINGS & OPERATION & MAINTENANCE MANUALS

- A. Shop drawings are required for each item of equipment, apparatus, device and piping furnished in this Division of the specifications. Shop drawings shall be as described in Section 01300 Submittals.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 DRAWINGS AND MEASUREMENTS

The drawings show the arrangement, general design and extent of the systems. The equipment, main lines and connections are shown in diagram and in their general locations, except where, in certain cases, the drawings may include details giving the exact location and arrangement.

The drawings are not intended to be scaled for roughing-in measurements nor to serve as shop drawings. Where drawings are required for these purposes or must be made from field measurements, they shall be prepared by the Contractor.

Field measurements necessary for getting out materials and fitting in the installation to the building construction shall be taken by the Contractor.

Shop drawings and/or equivalent information shall be submitted to the contractor by sub-contractors and will be passed upon by the Owner and returned through the Contractor.

3.2 RECORD "AS BUILT" DRAWINGS

The Contractor shall comply with all requirements of Section 01700 of these Specifications.

3.3 CUTTING AND REPAIRING

All cutting and repairing of existing and completed work, including manholes, which is required for the installation of the Contractor's work shall be done by the respective contractors for the various trades involved, at the Contractor's expense.

The Contractor shall provide openings in the floors, walls, etc., as required for the installation of the piping and equipment.

3.4 APPORTIONMENT OF THE WORK

The Contractor shall classify and apportion all materials and the performance of all labor to the several trades involved in accordance with all local customs, rules, regulations, jurisdictional awards, decisions, etc., insofar as they may apply to and as required to efficiently execute the work involved in this contract, regardless of the classification indicated in these specifications.

3.5 MATERIALS AND EQUIPMENT

All material shall be new and be the standard products of the manufacturer, unless otherwise specified or approved by the Owner. The Owner reserves the right to disapprove and reject any materials, proposed or installed, which in his opinion fail to meet these quality standards. The Contractor shall, at his own expense, remove and replace with approved materials, any materials which in the opinion of the Owner do not comply with these quality standards.

Any substitutions so made, shall be deemed to be made for the convenience of the Contractor and any and all additional costs resulting therefrom shall be borne by the contractor making the substitution.

Any items required to complete the work and not specifically mentioned herein, shall conform fully to the quality pattern established by these specifications.

3.6 STORAGE AND HANDLING OF MATERIALS AND EQUIPMENT

The Contractor shall coordinate delivery of equipment with his construction program so that an undue amount of storage space is not required. Space for contractor's use will be designated by the Owner.

The Contractor shall exercise care in the protection of materials and equipment furnished and/or installed under this contract while they are in storage at the site and during and after installation prior to final acceptance.

All materials and equipment shall be handled in a manner to avoid damage or breakage and delay in the completion of the work. The Contractor shall repair or replace, without cost to the Owner and to the satisfaction of the Owner, all items damaged or broken as a result of his operation.

All machined surfaces of the equipment subject to corrosion shall be protected by coating with grease immediately after finishing.

All flanges shall be protected prior to installation by means of wooden flanges bolted in place.

Pump casings shall be thoroughly drained of all water.

Equipment and materials stored outdoors shall be blocked up at least six inches above the ground.

Openings in tanks, valves and pipe shall be kept covered to prevent dirt, rubbish or water from entering, with machined surfaces such as flange faces, pipe threads, machined weld ends of pipe, and fittings protected from corrosion by proper Owner approved compounds.

All materials shall be protected from serious shock, denting, and marring of surfaces.

All unpainted steel surfaces shall be prevented from rusting by an Owner approved method.

Plate and sheet metal work shall be handled and stored with care to prevent permanent deformations or crimps in the material.

Whenever the shop coat of protective paint is damaged, spot coating shall be made immediately to prevent rusting.

All parts of the equipment shall be carefully crated to facilitate shipping and handling. The crates shall be constructed to completely protect the equipment and shall be sufficiently strong to permit lifting and skidding without requiring additional bracing or reinforcement.

All materials shall be so delivered, stored, and handled as to prevent the inclusion of foreign materials and/or damage by water, breakage or other causes. Packaged materials shall be delivered in original unopened containers and shall be stored until ready for use. Packages or materials showing evidence of damage or contamination, regardless of cause, will be rejected. All materials which have been stored shall be subject to retest and shall meet the requirements of these Specifications at the time they are used in the work and at the time of final acceptance of the work.

The Contractor shall obtain a letter from the equipment manufacturer describing the recommended methods of outdoor or indoor storage of the equipment at the site and shall fully comply with such recommendations.

All materials to be incorporated in the work shall be properly arranged, covered, and protected and the Contractor shall be solely responsible for the safety of the same.

Materials may be stored on the site in locations designated by the Owner.

3.7 ASBESTOS

No asbestos containing materials shall be allowed on the job site. No asbestos gaskets, packing insulation, etc. shall be furnished as a part of any item provided under these specifications.

3.8 MAINTENANCE PRIOR TO FINAL ACCEPTANCE

The Contractor shall be responsible for the maintenance of equipment and systems installed until final acceptance by the Owner and shall take such measures as necessary to insure adequate protection of all equipment and materials during delivery, storage, installation, start up, temporary operation, and shut down.

3.9 ADJUSTMENT AND OPERATION OF SYSTEMS

When the work included in these specifications is complete, and at such time as directed by the Owner, the Contractor shall adjust all parts of the systems, advising the Owner when this has been done and the work is ready for final tests.

If it becomes necessary for temporary use of the systems by the Contractor, before all parts are complete, the Contractor shall adjust all parts as far as possible in order to make said temporary use as effective as possible.

If such temporary use is for the Owner's benefit and cleaning or repairing of damage is necessary due to the Owner's actions, such cleaning and repair cost shall be paid by the Owner based on a prior negotiated price.

After temporary use and before acceptance tests, all systems shall be readjusted to meet permanent operational requirements. All systems shall be cleaned internally and externally before placing in operation, and any damaged surfaces shall be restored to as new condition.

3.10 EQUIPMENT BASES

All equipment on concrete floors shall be mounted on minimum 6" high concrete pads, unless otherwise noted on the drawings or required by the equipment for proper installation.

All motor driven equipment installed by suspension from building structure shall be so designed and so installed as to effectively isolate all vibration of the equipment from the building structure. The Owner will reject any installations where equipment vibration is not effectively isolated.

Except where otherwise hereinafter specified, the Contractor shall provide structural steel or cast-iron bases for all equipment which is to be installed on concrete floor slabs. Unless otherwise shown on the drawings, motors and the equipment they drive, shall be mounted on common bases from the floor.

Where structural bases, integral with floor slabs, are required, these shall be the responsibility of the Contractor. These shall be sized as recommended by the manufacturer of the equipment. The Contractor shall arrange for their pouring at the same time as the floor slab. All costs incidental to the

pouring of these bases shall be the responsibility of the contractor including modification of the details as shown on the drawings.

3.11 NAMEPLATES

Each component of equipment, unless otherwise specified, shall have the manufacturer's name and catalog number on a plate securely attached to the item or equipment, or the name and catalog number may be stamped or cast into the body of the item, nameplates shall also give data pertinent to the operation and characteristics of the equipment.

All equipment installed shall be identified in accordance with the following unless otherwise indicated on the drawings.

Individual pieces of equipment shall bear legend plates identifying the equipment numbers as called for on the drawings. Plates shall be white laminated plastic with engraved black letters.

The legend plates shall be 1-1/4" high and 3-1/2" wide and shall be attached to the equipment by means of stainless steel countersunk head machine screws with Phillips slots. The plates shall be approximately 3/32-inch-thick with beveled edges and shall have letter sizes and legends as approved by the Owner.

3.12 COORDINATION

Before proceeding with installation of piping, ductwork or other system, contractor shall inspect the contract documents and determine that the location of the work does not interfere with other work. In case of interference, the owner shall be notified in writing. The Owner shall then determine the resolution of the interference and shall so inform the Contractor. The Owner's decision shall be binding.

3.13 ACCEPTANCE TESTS

Upon completion of each installation of each equipment or process system and within 60 days after the date of initial operation of each system, the Contractor shall, at his expense, conduct complete performance tests in the present of the Owner, to fully demonstrate the capacity and all other characteristics of each system. These tests shall be run for not less than one (1) hour for each point, and shall fully demonstrate the ability of each piece of apparatus to perform as herein required and/or as called for on drawings and/or shown on the catalog of the manufacturer of the specified item and/or shown on the submitted shop drawings.

Upon completion of the work, the Contractor shall conduct a complete inspection of all items of work required by the contract documents, and make whatever corrections and adjustments are necessary to obtain a complete, well-functioning system, which meets the requirements of the Owner. All nameplates on equipment shall be kept clean for easy reading.

Pumps, motors and apparatus shall be made to operate at any condition up to full capacity without undue vibration, objectionable noise or overheating. Motors shall be proven not to heat to a temperature exceeding 80 degrees centigrade.

The Contractor shall provide all materials and labor necessary to perform these tests.

This Specification shall apply unless more stringent tests are outlined for a item of equipment.

3.14 PRESSURE TESTS

The testing requirements for the respective piping systems shall include all those of the applicable governing codes, such as state, local, and insurance, and those hereinafter specified. All code required inspection certificates shall be furnished by the Contractor, as required.

The Contractor shall make pressure tests on all piping included in the contract. All tests shall be made before piping is painted, covered or concealed. The Contractor shall furnish all pumps, compressors, gauges and other necessary testing equipment, material, and labor, and make all connections necessary for the tests.

All tests shall be made in the presence of the Owner and where required, the inspection department having jurisdiction, who shall be notified by the Contractor in sufficient time to enable him to be present. If inspection or tests show defects, such defective work or material shall be replaced and inspection and tests repeated. All repair to piping shall be made with new material and to the satisfaction of the authorized inspectors.

3.15 MAXIMUM PERMISSIBLE NOISE LEVEL

All steady or cyclical noise levels produced by machinery or equipment at the operator's position, and at all other points five feet from the equipment, shall not exceed 85 decibels (unless otherwise specified) when measured by a sound level meter meeting ANSI S1.4-1971, "Specification for General Purpose Sound Level Meters" set to "A" weighting and slow response.

3.16 ALIGNMENT

Alignment of all mechanical equipment shall be field checked by the contractor and adjusted as required prior to equipment start-up. This includes drives, couplings and piping connections. Log sheets for each coupling shall be submitted and shall include: date of alignment, gap, end float, angular and offset measurements. Log sheets shall also include the coupling manufacturer's maximum allowable for each measurement. The measured misalignment shall not be greater than 50% of the maximum allowable.

Piping connection to all mechanical equipment shall be disconnected after the installation is complete to verify that no strain is being placed on the equipment by the piping.

3.17 VIBRATION

Equipment shall be designed and installed so as to preclude excessive vibration. The Owner will reject any installations where excessive equipment vibration is in evidence.

3.18 INSERTS AND ANCHOR BOLTS

- A. The pumps are to be secured to the concrete basin floors with expansion type stainless steel anchor bolts.
- B. For the suspended piping, anchor bolts shall be Red-Head, Hilti, Wejit, Parabolt, Kwikbolt, or equal. The by-pass discharge piping shall be supported from the overhead pre-cast decking

with stainless steel bolts specifically recommended by the manufacturer for drilling into pre-cast decking.

END OF SECTION

SECTION 15030

PIPING INSTALLATION, GENERAL

PART 1 GENERAL

1.1 WORK INCLUDED

- A. This section of these specifications is intended to outline the basic construction methods and materials to be used for the installation of all piping and equipment systems, and such other work and materials that shall be used to meet the Contract requirements of the mechanical systems for the project to the best accepted level of practice, to meet the requirements of governing codes and as approved by the Owner.

1.2 NOTE

- A. This section is comprised of standards of construction and materials for the Mechanical Division of these specifications. The contractor shall refer to the detailed sections of the Mechanical Division of these specifications and to the drawings to ascertain which systems he is required to provide. Construction methods and materials for special systems, not described in this section are specified under the detailed section to which they apply. Where more stringent construction methods are required than imposed by this Section, they are specified in the particular sections and shall apply.

1.3 COORDINATION

- A. Before proceeding with installation of piping, etc. the contractor shall inspect the contract documents and determine that the location of the work does not interfere with other work. In case of interference, the Owner shall be notified in writing. The Owner will then determine the resolution of the conflict and his decision shall be binding.

PART 2 PRODUCTS

2.1 PIPING

- A. In the description of piping materials, the following abbreviations are used:
 - T & C Thread & Couple
 - Blk Black
 - stl steel
 - M.I. malleable iron
 - F.S. forged steel
 - C.S. cast steel
 - C.I. cast iron
 - D.I. ductile iron
 - scrd screwed
 - thk thick
 - galv galvanized
 - flgd flanged

sched. schedule

- B. All ratings in this description of piping materials shall be taken to mean American National Standard Institute ratings.

2.2 BOLTS, STUDS AND NUTS

- A. All steel bolts, studs and nuts shall be in conformity with the current Tentative Specifications for Low Carbon Steel Externally and Internally Threaded Standard Fasteners, ASTM Designation: A-307, Grade B.
- B. All carbon steel bolts and nuts used for joining flanged pipe shall be galvanized or cadmium plated unless otherwise called for. All bolts shall be coated with anti-seize compound prior to assembly.
- C. Sleeves for anchor bolts shall be made of Schedule 40 steel pipe and shall be at least 1/2 inch larger in inside diameter than the anchor bolt.

2.3 ANCHORS

- A. Anchors shall be provided to rigidly and securely fasten piping to building construction where shown or as required.
- B. Anchors shall be located in such a manner that they will not distort any part of the building as the result of expansion and contraction of piping.
- C. Anchors may be angle iron, inserts, U-bolts and anchor chairs, or a combination of the above. Anchors may also be the screwed coupling type.

2.4 INSERTS AND ANCHOR BOLTS

- A. All piping which must be supported from concrete walls, ceiling slabs, columns and other building masonry (except floors) shall be attached by means of approved inserts embedded in concrete or masonry, unless otherwise noted.
- B. Inserts shall be continuous slotted inserts approximately 1-5/8" wide, 1-3/8" deep by length as required, roll formed not less than 12 gage steel into slotted "U" conformation for 5/8 in. bolt size unless otherwise indicated, with anchors spaced on not more than 6 in. centers, plates and bolts and nuts as required by conditions, shall be provided. Slotted inserts shall be Gateway Erectors, Inc., Type "G", Hohman and Barnard Type CH05, or equal.
- C. Piping to be secured to floor slabs or concrete bases shall be supported with approved prefabricated supports anchored to the floor or cast in place concrete supports.
- D. Drilled expansive anchor bolts are permissible provided that electric hammers are used, and that the specific hammers have been approved for the purpose by the Owner. Anchor bolts shall be Wejit, Parabolts, Kwikbolt, or equal. All bolts shall be stainless steel coated with anti-seize compound prior to assembly.

2.5 PRESSURE GAUGES

- A. Pressure gauges shall be provided and installed on the suction and discharge lines of each pump. Range for the gauges shall be 0-50 psi on the discharge and 15-0-15 psi on the suction. Gauges shall be a minimum of 4 inches in diameter and shall be glycerin filled. Rated accuracy shall be one (1%) percent of full scale reading. Gauges shall be Ashcroft or equal.
- B. Gauges shall be mounted firmly secured to pumps or piping. Gauge installations shall be complete with all hoses and fittings, and shall include a shutoff valve and sludge/solids isolater installed in each gauge line at the point of connection to suction and discharge pipes. Isolater shall be Red Valve Series 742 or equal.

2.6 PIPE GUIDES AND SPACING

- A. Approved pipe alignment guides shall be provided in the piping adjacent to and on each side of all pipe expansion joints and loops, in order to control the pipe movement in true perpendicular alignment to the expansion joints and loops.
- B. First guides at 4 pipe diameters on each side of device.
- C. Second guides at 14 pipe diameters beyond first guide.
- D. Intermediate guides per standard of Expansion Joint Manufacturers Association (E.J.M.A.).

PART 3 EXECUTION

3.1 EXCAVATION AND BACKFILLING - UNDERGROUND PIPING

- A. The contractor shall perform all necessary excavating, trenching, backfilling, shoring and restoring, in connection with his work as specified herein. Excavations shall conform to the invert dimensions designated on the drawings or as required by field conditions and/or directed by the Owner.
- B. On excavations which occur near and below any foundation footings, the backfilling materials shall consist of concrete poured up to the level of the bottom of footing of the same strength as the concrete in the footings.
- C. Crossing Protection: Adequate temporary crossovers for pedestrian and vehicular traffic shall be provided including guard rails, lamps and flags, as required by agencies having jurisdiction and as directed by the Owner. All items shall be removed when necessity for such protection ceases.

3.2 UNDERGROUND PIPING INSTALLATION

- A. No piping shall be installed in filled or disturbed earth until the earth has been compacted to properly support general construction, as specified in the backfill requirements.
- B. All trenches shall be dry and clean when pipe is being laid.

- C. Pipe and fittings shall be inspected for defects prior to being lowered into the trench and shall be cleaned both inside of the bell and outside of the spigot.
- D. All pipe lines shall be laid straight and in true alignment with the grade and location established on the drawings, or as directed by the Owner.
- E. Pipes passing through walls below grade and passing through sleeves shall be made watertight by sealing as specified or in an approved manner.
- F. In some cases, pipe shall pass through boxed out areas in slabs or walls, as shown on the Drawings.
- G. Pipes or tubing passing through or under building grade beams shall be installed in a sleeve giving 4 in. clearance to prevent possible damage from settling of the building.

3.3 FLUSHING UNDERGROUND SYSTEMS

- A. Before backfilling and before connecting aboveground systems to the underground connections, all pipe, fittings, valves, etc., shall be cleaned of core sand, scale and other foreign matter.
- B. Underground piping shall be flushed with water at a velocity of at least 6 ft. per second for a fifteen (15) minute period, or until all dirt and debris are thoroughly flushed out.

3.4 ABOVEGROUND PIPING INSTALLATION-ALL SERVICES

- A. General
 - 1. Pipe lines aboveground shall be run parallel with the lines of the building unless otherwise shown or noted on the drawings. All horizontal runs of piping shall be kept as high as possible so as to provide maximum head room. Vertical lines shall be kept as close to the columns or walls as possible. Pipe lines shall be run so as not to interfere with ducts, conduits or apparatus and with approved offsets around columns, beams and other obstructions, and with necessary expansion joints, pipe bends or fitting offsets, as may be indicated on the drawings or required as essential to an approved installation.
 - 2. All pipe ends shall be reamed. Care shall be taken at all times to prevent foreign material from entering any pipe.
 - 3. All threaded coupling shall be made using an approved teflon tape on the male end. Care shall be taken to prevent the tape from reaching the pipe interior.
 - 4. All horizontal lines shall pitch to low points to provide for complete drainage of each system. Pitch, unless otherwise shown on the drawings shall be not less than 1 inch in 40 feet against direction of flow. Air vents shall be installed at all high points and at locations where air may pocket on all water lines. Air vents shall be drained to sewers or suitable receivers. Hot water heating, gas and air lines shall pitch as stated, but in direction of flow.
 - 5. All gaseous piping connections to equipment shall be valved and where practical shall be taken off the top of the main or sub-main.
 - 6. Structural steel shall not be cut burned or welded to aid in piping installation except with written approval of the Owner.

B. Placement of Valves:

1. Valves shall be installed at all service connections to equipment, branch lines from main lines, at low points for draining each system and as shown on the drawings.
2. Chain wheel operators shall be provided for all valves located 7'-0" or more above floor surfaces.

C. Piping Hangers and Supports:

1. All piping shall be adequately supported by means of hangers and supports. Overhead lines shall be carried directly on supports or suspended by clevis hangers from supports. All support steel, hangers, etc., shall be furnished and installed. Piping at all equipment, control valves, etc., shall be supported so that equipment, valves, etc., can be removed without further supporting the piping. Additional support for valves installed in fiberglass and PVC pipe lines shall be provided as required. Piping shall not introduce any strains or distortion to the connected equipment.
2. Spacing of supports for horizontal piping shall be no greater than shown on the following schedule or as detailed on the drawings:

| <u>Steel & SS Pipe</u> | <u>Support Spacing</u> | <u>Copper Pipe</u> | <u>Support Bracing</u> |
|----------------------------|------------------------|--------------------|------------------------|
| 1/2" & smaller | 7'-0" | 1/2" | 6'-0" |
| 3/4" - 1" | 8'-0" | 3/4" - 1" | 8'-0" |
| 1-1/4" - 1-1/2" | 9'-0" | 1-1/2" - 2" | 10'-0" |
| 2" | 10'-0" | 2-1/2" - 5" | 12'-0" |
| 2-1/2" - 3-1/2" | 12'-0" | 6" & larger | 14'-0" |
| 4" - 5" | 14'-0" | | |
| 6" | 16'-0" | | |
| 8" - 12" | 20'-0" | | |

| <u>Fiberglass Pipe</u> | <u>Support Spacing</u> | <u>PVC & Poly-Propylene Pipe</u> | <u>Support Bracing</u> |
|------------------------|------------------------|--------------------------------------|------------------------|
| 2" | 7'-0" | 1/2" - 3/4" | 3'-0" |
| 3" | 7'-6" | 1" - 1-1/2" | 3'-6" |
| 4" | 8'-0" | 2" | 4'-0" |
| 6" | 9'-0" | 2-1/2" - 3" | 4'-6" |
| 8" | 10'-0" | 4" | 5'-0" |
| 10" | 11'-0" | 6" | 6'-0" |
| 12" | 12'-0" | | |
| 14" and larger | 13'-0" | | |

3. Cast iron soil pipe shall be supported close to hubs. A minimum of one support shall be used for each pipe length.
4. Cast iron and ductile iron pipe shall be supported at each joint or at 12'-0" maximum centers, whichever is closer.
5. Hanger rods used in conjunction with clevis hangers shall be sized as indicated in the following schedule. Rods shall be cold rolled steel. Rods installed in below grade galleries, in wet wells, or within retention structure shall be stainless steel.

| <u>Pipe Size</u> | <u>Hanger Rod Dia.</u> |
|------------------|------------------------|
| 1/2" - 2" | 3/8" |
| 2-1/2" - 3-1/2" | 1/2" |
| 4" - 5" | 5/8" |
| 6" | 3/4" |
| 8" - 12" | 7/8" |
| 14" - 18" | 1" |

6. All stainless steel piping shall be supported with stainless steel brackets and hardware.
7. Trapeze hangers with U-Bolt type fastening may be used in lieu of clevis hangers in congested areas.
8. "Unistrut" used to support piping shall be Series P1000, galvanized, as manufactured by the Unistrut Products Co., Super Strut A-1200, Power Strut PS-200, or equal.
9. Risers shall be supported at intermediate points as required for rigidity.
10. Vertical piping shall be supported at its base by a hanger placed in the horizontal line near the riser, or by a base fitting set on a pedestal or foundation.
11. Hanger rods shall be connected to beam clamps, concrete inserts, or expansion shields. These devices shall be Underwriter's Laboratories approved. C-clamps will not be allowed.
12. Inserts shall be used for suspending hangers from concrete. Cadmium coated or galvanized inserts shall be used where galvanized hangers are required. Other means of setting anchors must be approved by the Owner.
13. Perforated band iron or wire hangers shall not be used.
14. Clevis type pipe hangers shall be adjustable wrought steel. Grinnel Figure No. 260, Fee and Mason Fig. 239, Carpenter and Patterson Fig. 100, or equal, complete with bolts, rods and nuts.
15. Beam clamps shall be malleable iron with bolt, nut and pocket threaded for rod connection. Grinnel Fig. 229, or Elcen Fig. 95.

D. Unions and Flanges:

1. Unions shall be provided at all valves up to 4" size, and at final connections to equipment, or apparatus. Sufficient joints shall be provided in piping systems to provide means of readily dismantling each system. Joints shall also be provided where shown on the drawings.
2. Unions shall be of the type, material and pressure rating as herein specified for the services involved. Unions for 4 in. pipe size and larger shall be made with gasketed companion flanges or grooved pipe couplings, as specified.
3. Unions for copper pipe shall be cast or wrought copper solder type pressure fittings of suitable size and end connections.
4. Unions and companion flanges shall be installed in the pipe lines at such locations as needed to permit the removal of fixtures, apparatus or equipment without dismantling. Unions and companion flanges shall not be installed in walls, ceilings, partitions or other inaccessible locations.
5. Wherever flanges with raised faces are joined to companion flanges with a flat face, the raised face shall be machined down to a smooth matching surface and a full face gasket shall be used.

- E. Reducer Fittings:
1. For proper drainage and air elimination eccentric type fittings shall be used when decrease in pipe size is necessary. Bushings shall not be permitted.
 2. For water and other liquid lines top of pipe shall be installed on a continuous straight line.
 3. For hot water heating, gas and air lines bottom of the pipe shall be installed on a continuous straight line.
- F. Pipe Sleeves, Cover Plates & Flashings:
1. All pipe shall be provided with sleeves, flashings and plates shall be furnished, located and set for sections of the work where piping passes through floors, walls, ceilings or roof. Where sleeves pass through concrete construction, sleeves shall be located and set before concrete is poured.
 2. All sleeves through concrete or masonry walls or floors shall be schedule 40 black steel pipe or molded non-metallic high density polyethylene Model CS Century-Line sleeves as manufactured by CSI-Thunderline/Link-Seal or equal. Sleeves passing through walls or floors with water, earth or weather on one side shall be provided with 1/4" thick leakplates continuously welded to the sleeves at mid slab. Floor pipe sleeves shall extend 2" above floor surface. Space between pipe and exterior sleeves shall be sealed so as to provide air tightness for above ground installations and water tightness for below grade installations. Sealing medium shall consist of synthetic rubber links, corrosion resistant pressure plates and 316 Stainless Steel bolts as manufactured by PSI-Thunderline/Link-Seal. Caulking or other type mastic sealants or lead oakum joints are not acceptable.
 3. Sleeves shall be of sufficient diameter to allow for pipe insulation and its jacketing, where insulation is required.
 4. Piping extending into finished areas of the building shall have chrome plated floor, wall or ceiling plates, large enough to cover the pipe sleeves.
- G. Pipe Welding:
1. All pipe welding may be by either oxy-acetylene or arc method, and shall be done by approved welders, qualified in accordance with accepted "Welder Qualifications and Procedures". Welding procedures and joint quality shall strictly conform to above procedures. The Owner reserves the right to require qualifying demonstrations at the mechanical contractor's expense, of any welders assigned to the job.
 2. Tee connections in welded piping shall be made with a factory fabricated butt welding tee or with Weld-o-let of butt, socket or threaded type. When Weld-o-lets are used, the size of the branch connection shall be one-half the diameter of the main or less. Scarf welding or direct butt welding of side connections shall not be permitted. Tees fabricated from pipe shall not be permitted.
 3. Long radius welding ells, shall, whenever possible, be used in changing pipe directions of welded pipe lines. Mitered joints shall not be used unless approved by Owner.
- H. All insulated piping (FEW water piping) shall be covered with a vapor barrier jacket and regardless of jacket, shall be supported on saddles, such as Grinnel Fig. 167, Elcen Fig. 219 B-Line systems Fig. B-315, or equal.

3.5 PIPE SADDLES FOR INSULATED PIPING (GENERAL)

- A. For installations where the supported weight of the pipe is sufficient to distort the pipe insulation with the shield in place, hard wood blocking shall be installed against the pipe. Wood blocking shall be the same thickness as the insulation and shall be paraffin coated. Wood blocking shall be B-Line Systems Fig. B3169, Elcen Fig. 216 or equal. Vapor barrier shall be installed over the wood blocking to maintain the integrity of the system.

3.6 MISCELLANEOUS IRON WORK

- A. All structural supports, platforms, braces or tie rods required to support or hang piping and mechanical equipment without vibration shall be furnished and installed as required or directed by the Owner.

3.7 SHOP PRIMING PROCEDURES

- A. Unless specified otherwise, ferrous metal items, except items to be encased in concrete and areas adjacent to field welds shall be thoroughly cleaned and prime painted as described in Section 09900.

3.8 PROTECTION/CLEANING OF PIPING AND EQUIPMENT SYSTEMS

- A. It shall be the responsibility of this Contractor to install and maintain pipe and equipment which is reasonably clean and free from rust, dirt, scale, etc. Where necessary, this contractor shall provide temporary airtight covers at all pipe and equipment openings.

END OF SECTION

SECTION 15060

PIPE AND PIPE FITTINGS

PART 1 GENERAL

1.1 SUMMARY OF WORK

- A. Furnish all labor, materials, tools, equipment, testing, and supervision required to complete all piping systems, as indicated on the drawings and specified herein, and all other work incidental thereto, except as otherwise noted.
- B. The requirements of Section 15000, "General Mechanical Provisions" and Section 15030, "Construction Methods" form a part of this Section and govern work covered in this Section.

1.2 RELATED WORK

- A. Section 09900 - Painting.
- B. Section 15000 - "General Equipment."
- C. Section 15030 - "Construction Methods."
- D. Section 15100 - "Valves."

1.3 SUBMITTALS

- A. Shop drawings are required for each item in this section of the specifications, including, but not limited to piping, couplings, gaskets, fittings, layouts, dimensions, etc. in accordance with Section 01300.
- B. Pressure Test Reports.

1.4 DELIVERY STORAGE AND PROTECTION

- A. Properly store, protect, and handle all pipe per manufacturer recommendations.
- B. Store all plastic pipe indoors or cover until installed.

PART 2 PRODUCTS

2.1 PIPING MATERIALS

- A. Various types of piping materials are used to meet the specific requirements of the different piping systems as indicated in the "Piping Systems Schedule." This schedule shall be followed unless another piping material is chosen for a specific piping system, in which case that material alone shall be used throughout that entire system of pipe and fittings, unless noted otherwise on the drawings.

- B. Flanges or grooved couplings shall be installed at connections to all equipment and valves 3 inches and over.
- C. Unions or grooved couplings shall be installed at connections to all equipment and valves 2 inches and below.

2.2 ABOVE GRADE DUCTILE IRON PIPE (D.I.)

- A. Ductile iron pipe and fittings shall be standard cement lined and shall meet the requirements of the current ANSI A21.15, (AWWA C115), "Ductile-Iron Pipe, Centrifugal Cast in Metal Molds or Sandlined Molds, for Water or other Liquids," and ANSI A21.10 (AWWA C110) "Ductile Iron and Gray Iron Fittings 3" through 48" for water and other liquids. Cement lining shall conform to ANSI 21.4 (AWWA C104) requirements. Compact Fittings are not acceptable, except as otherwise specified herein.
- B. The minimum pipe thickness shall be Class 53.
- C. Flanged joints for above--grade piping shall be in conformity with the current ANSI B16.1, "Cast Iron Pipe Flanges and Flanged Fittings," Class 125. Non-Threaded mechanical flange fittings are not allowed.
- D. Bolts for all pipe materials shall be cadmium plated or hot-dipped galvanized as specified in Section 15030 unless otherwise specified. All bolts shall be coated with anti-seize compound prior to assembly.
- E. Gaskets for D.I. pipe shall be full face type made of minimum 1/8-inch thick nitrile with a durometer hardness of 55 to 65 and shall conform to ANSI/AWWA A21.11/C 111 requirements unless otherwise specified. Gaskets for blind flanges shall cover the full face of the blind flange. Gaskets shall be as manufactured by Manville, Garlock or equal.
- F. Grooved Pipe Couplings
 1. Grooved couplings for ductile iron pipe shall be Victaulic Style 31, or equal, with Grade "S" gaskets and grooves cut for rigid joints.
 2. Grooved fittings for ductile iron pipe shall be Victaulic with rigid grooves conforming to ANSI/AWWA C-606.
 3. Couplings shall engage the grooved pipe around the entire circumference, and bolt together with two or more track head bolts. All bolts and nuts shall be cadmium or zinc plated except inside the wet well or corrosive areas where they shall be 316 SS.
- G. Joints for non-buried piping shall be flanged or grooved pipe couplings. In general pipe connections to valves or equipment shall be flanged unless otherwise indicated on the Drawings.

2.3 BURIED DUCTILE IRON PIPE (D.I.)

- A. Buried ductile iron pipe shall be Class 54 and shall conform to ANSI/AWWA C151/A21.51-02 with standard cement lining. Cement lining shall conform to ANSI 21.4 (AWWA C104) requirements.

- B. Pipe joints for below grade shall be restrained push on type or mechanical joints with retainer type glands. Retainer glands shall be Series 1100 Megalug as manufactured by Ebaa Iron Sales, Inc. Bolts shall be protected from corrosion by coating with Bitumastic No. 50 or cement mortar to a minimum thickness of one inch.
- C. Polyethylene wrap shall be installed on all pipes except concrete encased pipes. The polyethylene wrap shall be cross-laminated high density and manufactured of virgin polyethylene material conforming to the requirements of ASTM A-674-00. Raw materials used for the film, its strength, thickness, tube size, or sheet width must conform to ANSI/AWWA C105/A21.5.99.
- D. All bends, tees, wyes and other special fittings shall be cast iron Class 250 conforming to ANSI/AWWA C110/A21.10-98 or ductile iron Class 350 conforming to AWWA C153/A21.53-00 with standard cement lining.

2.4 CAST IRON SOIL PIPE (CISP)

- A. Cast iron soil pipe and fittings shall be bell and spigot type conforming to current ASTM A74 specifications with neoprene gasket compression joints. Pipe and fittings shall be tar coated.

2.5 STEEL PIPE

- A. Steel pipe and fittings shall be schedule 40 black steel pipe and shall conform to the following specification:
- B. All joints in piping 3" and smaller shall be screwed. Fittings shall be 150 lb. M.I. ANSI B16.3. All joints in piping 4" and larger shall be welded, flanged or grooved pipe couplings. In general pipe connections to valves or equipment shall be flanged unless otherwise indicated on the Drawings.
- C. Coated steel pipe shall be as specified above, with welded joints. The piping exterior shall be grit blasted to SSPC No. 6 specifications prior to coating and a 10 mils thick coating of a modified rubber adhesive shall be applied. A high density polyethylene (extrusion process) coating shall be applied over the adhesive according to the following schedule:

| <u>Pipe Size</u> | <u>Coating Thickness</u> |
|------------------|--------------------------|
| 3/8" – 1-1/2" | 25 mils |
| 2" – 2-1/2" | 30 mils |
| 3" – 4" | 35 mils |

- D. Galvanized steel pipe and fittings shall be Schedule 40 in conformity with the requirements of ASTM Specification A 120 for hot dipped galvanized Welded and Seamless Steel Pipe for ordinary uses. Connections shall be screwed type.
- E. Unions and Pipe Couplings
 - 1. All steel pipe unions shall be malleable iron with ground joint, iron to brass seat and shall be rated for a steam working pressure of not less than 150 psi. The opening through the union shall have an area of not less than the full area of the pipe. Unions shall be galvanized when installed in galvanized lines. The unions shall be No. 7716, as manufactured by Walworth, or equal.

2. Unions shall be compatible with the specific piping system where they are installed.

F. Grooved Pipe Couplings

1. Grooved couplings and fittings for steel pipe 1” to 24” shall be Victaulic Style 07 and Vic-ring Type D for 30” and above or equal for rigid connections. Grooved couplings and fittings for flexible connections shall be Victaulic Style 77 or equal. Gaskets shall be Grade “T”.
 - a. Grooving of pipe shall be done to supply rigid grooves in accordance with ANSI/AWWA C-606.
 - b. Couplings shall engage the grooved pipe around the entire circumference, and bolt together with two or more track head bolts. All bolts and nuts shall be cadmium or zinc plated except inside the wet well or corrosive areas where they shall be 316SS.

2.6 STAINLESS STEEL PIPE (SS)

- A. Stainless steel pipe shall be Schedule 10, manufactured from ASTM-A240 annealed and pickled sheets and plates in accordance with ASTM A778 in type 304L stainless steel. Pipe shall be manufactured to nominal pipe sizes as listed in ANSI B36.19, Table 2.
- B. Fittings shall be butt weld type or grooved end manufactured in accordance with ASTM-A-774 of the same raw material and in the same thicknesses as the pipe. Long radius elbows up to 24” diameter shall be smoothflow; i.e. centerline to end of elbow equals 1.5 times the nominal pipe size. All short radius, special radius, and reducing elbows and long radius elbows greater than 24” diameter shall be of mitered construction with at least (5) miter sections for 90 degree bends, (3) mitered sections for 45 to 60 degree bends, and (2) mitered sections for 30 degree and smaller bends. Reducers shall be straight tapered, cone type. Tees, crosses, laterals and wyes shall be shop fabricated from pipe.
- C. The finish on the raw material, manufactured to ASTM A-20 shall be No. 1, HRAP (hot rolled annealed and pickled) or better. The finish on the completed pipe and fittings shall be as specified in ASTM A778 and A774, respectively.
- D. Flanged pipe ends shall be made up on type 304L stainless steel slip-on type rolled angle face rings and (primed or hot dipped galvanized) ductile iron back-up flanges drilled to ANSI 16.1 class 125 standard. The angle face ring thickness shall be equal to or greater than the wall of the pipe or fitting to which it is welded and it shall be continuously welded on both sides to the pipe or fitting. The angle leg shall not interfere with the flange bolt holes. The back-up flanges shall be supplied with the following nominal thicknesses.

| Nom. Pipe Size (in) | Flange Thickness (in) |
|---------------------|-----------------------|
| 2 ½ - 3 | ½ |
| 4 | 9/16 |
| 6-10 | 5/8 |
| 12-16 | ¾ |
| 8-20 | 7/8 |

- E. Arched band type couplings shall be stainless steel of equal superior alloy and wall thickness as the pipe and shall be Depend-O-Lok type as manufactured by Victaulic Brico or equal. Couplings indicated on the drawings shall be fixed type, expansion type, or fixed by expansion type as recommended by the coupling manufacturer to control expansion and contraction in the aeration piping system. The pipe shall be plain end with external weld beads ground smooth and with S.S. restraining rings shop welded to the piping for fixed type couplings.
- F. Stainless steel pipe may be grooved end in accordance with ANSI/AWWA C-606 at the contractor's option. Where grooved joints are utilized coupling shall be a galvanized Victaulic Style 07 coupling with grade E gaskets for liquid service and grade L silicone for air service.

2.7 STAINLESS STEEL TUBING & FITTINGS (SST)

- A. Air tubing shall be welded, Type 316 stainless steel meeting ASTM A269. Hardness shall be 80 Rb or less, 200 psig minimum pressure rating.
- B. Tubing diameters indicated on the drawings are minimum Inside Diameters (I.D.). Tubing Outside Diameters (O.D.) shall be determined on the pressure and temperature constraints above, the ultimate tensile strength and the minimum wall thickness as determined by ASME/ANSI B31.3.
- C. Tube fittings and ferrules shall be type 316 stainless steel free of scratches and suitable for bending and flaring. Threads shall meet NPT specifications.
- D. Fittings shall be Swagelok as manufactured by Crawford Fitting Company or CPI fittings as manufactured by Parker Hannifin.

2.8 REINFORCED CONCRETE PIPE (ASTM C-76)

- A. Modified groove tongue joint with approved rubber gasket, ASTM C-443 except as such specifications relate to infiltration limitations.

2.9 FEW (IW) PIPING

- A. Copper Tubing (<3"): ASTM B88 (ASTM B88M), Type [M,] [L,] [K,] hard drawn.
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B32, solder, Grade 95TA.
- B. Steel Pipe (>=3"): ASTM A53 Schedule 40, galvanized.
 - 1. Fittings: Cast iron.
 - 2. Joints: Grooved mechanical couplings.
- C. Use dielectric unions when joining dissimilar metals.

2.10 CHEMICAL/PRESSATE PIPING

- A. PVC Pipe (discharge pipe): Sch. 80 ASTM D1785 or ASTM D2241.

1. Fittings: ASTM D2665, PVC.
2. Joints: ASTM D2846, solvent weld with ASTM F493 solvent cement.

B. Chemical Tubing (suction hose): Tubing shall be clear with braided reinforcement. The tubing shall have a pressure rating of 150 psi and a temperature range from -75F to 160F. Submit documentation that the proposed tubing is compatible with the chemical feed use and concentration for which it is intended. Tubing shall be Tygon, Tygothane, Excelon or approved equal.

2.11 FLANGED ADAPTER COUPLINGS

A. Flanged adapter couplings shall be installed at locations indicated on the Drawings and shall be of the bolted split sleeve type with one-piece split housing, flanged sleeve, gasket assembly, end rings (for welding to pipe and flanged sleeve) and bolts and nuts for attachment of the split housing. Couplings shall be of ASTM A-36 carbon steel construction with double arch cross section split sleeve and Buna N gasket designed to create a radial seal as the coupling is assembled around the pipe. Bolts and nuts shall be carbon steel ASTM A-325.

B. Couplings shall be furnished with carbon steel end rings for field welding to the pipe and flanged sleeve. The rings shall be designed to engage shoulders at the ends of the split sleeve and provide for restraint of the joint. Welding dimensions and specifications shall be in strict accordance with the coupling manufacturers recommendations.

C. Interior wetted surfaces of the coupling shall be coated in accordance with painting system No. 6, specification section 09900.

D. Couplings, end rings and ring welding shall be suitable for the following pressure ratings:

| <u>Piping System</u> | <u>Pressure Rating</u> |
|----------------------|------------------------|
| Sewage and Sludge | 50 psi |

E. Flanged adapter couplings shall be MEGAFLANGE Series 2100 as manufactured by EBAA Iron.

2.12 BOLTED FLEXIBLE COUPLINGS

A. Bolted flexible couplings shall be Style 38, Dresser Couplings with plain grade 42 gaskets, or equal. All bolted flexible couplings on pressurized lines installed above grade shall be provided with restraining rods designed to resist the test pressure of the piping system.

2.13 FLEXIBLE PIPE CONNECTORS

A. Provide flexible connectors on inlet and outlet piping to the air blowers and as shown on the Drawings. Existing flexible coupling from the two existing blowers made by re-used.

B. Connectors shall have one-arch synthetic rubber construction with integral 150 lb. flanged ends. Units shall be rated for temperatures up to 230° F at 65 psi.

C. Connectors shall be Mercer spool type 100 HT, Red Valve, Proco, or equal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Pipe and Fittings shall be installed according to Section 15000 and per manufacturer recommendations.
- B. Flanges shall be used at connections to all equipment. Where screwed ends are present, a union shall be installed.
- C. Ductile Iron Pipe
 - 1. Flanges shall not be assembled in the field.
 - 2. The flanges shall be power assembled and screwed tight on the pipe until pipe ends project beyond the face line of the flange. The face of the flange and the end of the pipe shall be machine finished to the same plane and normal to the pipe centerline. The flange hub shall completely cover the threaded portion of the pipe so that the machined surface of the pipe is protected against corrosion. After assembly to the pipe, bolt holes shall be drilled. The holes shall accurately straddle pipe and fittings centerline. Drilled holes for flanges shall be spot faced on the back of the flanges. All flange faces shall be machined to a smoothness of not less than 125 rms.
- D. Coated Steel Pipe Joints
 - 1. Joints shall be primed and taped per the coating manufacturer's recommendation. Piping shall be handled with rope or burlap slings. No metallic pipe handling equipment shall be allowed. Trenches shall be backfilled with sand. No stones shall be allowed in the backfill material. The pipe during manufacturing, upon delivery and after placement, shall be subject to inspection and testing. The coating shall be as manufactured by Standard Pipe Protection or equal.
- E. Steel Pipe and Fittings
 - 1. Where field welding is required, it shall be done in accordance with Section 15030.
- F. Steel Tubing and Fittings
 - 1. The minimum radii of all tube bends, as measured from the centerline, shall comply with the following table.
 - 2. Where fittings are installed near tube bends, the minimum straight length of tubing required following the bend shall comply with the following table.

| Tube O.D. | Minimum Radius (90°bend) | Minimum Length |
|-----------|-----------------------------|----------------|
| 3/8" | 1" | 3/4" |
| 1/2" | 1-1/2" | 1" |
| 5/8" | 1-3/4" | 1-1/4" |
| 3/4" | 2" | 1-1/2" |
| 7/8" | 2-1/2" | 1-1/2" |
| 1" | 3" | 1-3/4" |
| 1-1/4" | 4" | 2" |
| 1-1/2" | 4-1/2" | 2-1/2" |
| 2" | 8" | 3-1/2" |

G. Copper Tubing

1. Solder joint type fittings shall be in conformity with the current ANSI B16.18: "Cast Brass Solder Joint Fittings". Solder shall be 95-5 tin antimony. Only lead free solder shall be used.
2. Flared joint type fittings shall be made of brass and shall be the SAE Type with long nuts. Tubing shall be flared by proper flaring tools designed specifically for such joints.

H. LAYING OF TRUSS PIPE, ABS AND PVC

1. Bedding ABS, PVC and Truss Pipe shall be in accordance with current specifications of A.S.T.M. D-2321, except only Class I and Class II embedment materials may be used; embedment shall extend to a minimum 12" above top of pipe; flooding or puddling shall not be used. Class I embedment material is angular (1/4 to 3/4 in.), graded stone, slag, cinders or crushed stone. Class II embedment material is coarse sand and gravel with maximum particle size (1 1/2 in.), including various graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. It is essential that it be recognized that the successful use of flexible and semi-flexible pipe requires bedding that provides unyielding side support and complete bedding contact under pipe haunches. See sewer detail sheet.
2. Where unstable bottoms are encountered, the Contractor shall provide a foundation consisting of an approved graded and processed angular stone or gravel to act as an impervious mat to prevent migration or vertical movement of unstable soils or bedding materials. Where trench sheeting, plates, or a trench box are used due to unstable ground conditions, all voids to the side and below the top of the piped caused by the sheeting, plates or box withdrawal shall be completely filled or the supports left in place below the top of the pipe.
3. Concrete cradle bedding shall not be used where allowable trench widths are exceeded. In lieu of concrete cradle bedding, standard pipe bedding shall be provided to the full width between undisturbed trench walls, or at least to 2.5 pipe diameters on both sides of the pipe.
4. Potential damage to exterior walls of Truss Pipe, particularly under cold weather conditions can occur if rocks, frozen material, or large objects strike the pipe. The Contractor shall carefully avoid dumping any materials other than approved bedding sand or stone on the pipe until a 12" cover is placed on it. Pipe walls and joints shall also be protected from abrasion and damage during handling and shall be fully inspected just prior to placing in the trench. Care shall be taken during bedding compaction to avoid distorting the shape of the pipe or damaging its exterior wall.
5. Joints
 - a. Joints for ABS and Truss pipe shall be chemically welded, in accordance with the manufacturer's recommendation. Additionally, all ends of truss pipe shall be fully and thoroughly coated with plastic jointing cement, prior to making joints, so as to insure proper bonding. Pipes shall be rotated during joint insertion to insure a complete spread of jointing cement. ABS plastic cement and ABS plastic cement primer shall arrive at the job site in sealed and labeled containers. Johnny Mops or similar swab type applicators shall be used to apply primer and cement. Opened containers in the trench shall be protected from dirt, water and other contaminants.
 - b. Joints for PVC pipe and fittings shall be of the elastomeric gasket push-on type. Gasket joints shall be installed in accordance with procedures specified by the pipe manufacturer. Care should be taken to ensure all joints being

pushed to the full home position and held tightly in home position during any grade or line adjustments.

6. Cutting & Handling
 - a. Cutting of pipe lengths, where required, shall be performed by the use of tools or equipment that will provide a neat, perpendicular cut without damage to the plastic or the filler material. Bowing or warping of pipe can occur with temperature fluctuations. The Contractor shall store and protect the pipe to minimize bowing. Nominal 12'-6" pipe lengths having deviations from straight greater than 1" shall not be used.
7. Special Conditions
 - a. The completed installation shall, at no point, have out-of-round pipe deflections greater than 5%. The Owner shall have the option of requiring deflectometer or go/no-go gauging tests run prior to acceptance on pipelines where high deflections are suspected. Pipe with deflections greater than 5% will be considered unacceptable and shall be re-laid by the Contractor.
 - b. Unless specified otherwise in these specifications, as a means of ensuring that pipe laying is properly done and that all joints are in a "home" position, the Contractor shall provide for television viewing of 100% of the truss pipe footage laid. The Contractor shall provide 24 hours notice to the Owner prior to television viewing, so that a representative may be present.
 - c. Flexible manhole joints shall be provided in all new manhole construction. To maintain the flexibility of the pipe materials, concrete encasement of drop connections shall not be used. Where adapters to other materials are required, only approved adapters and joints may be used. When constructing a manhole over an existing sewer, flexible joints shall not be required at the walls of the existing sewer connecting into the manhole. The existing sewer pipe within the manhole shall not be removed as required to provide the channel until the newly constructed sewer extension has been tested and approved. During removal of the existing sewer within the manhole, every effort will be taken to prevent any debris from entering the sewer line.

3.2 PREVENTION OF ELECTROLYSIS

- A. Insulating couplings shall be provided at all joints between piping systems constructed of dissimilar metals.

3.3 PRESSURE TESTS

- A. Piping shall be hydrostatically pressure tested according to Section 15000.

3.4 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Disinfect water distribution system in accordance with AWWA and MDEQ requirements..

3.5 PAINTING

- A. Ductile, Cast Iron, Carbon Steel, Copper and Plastic pipe shall be painted according to Section 09900 of these specifications.
- B. Stainless Steel Pipe and Tubing shall not be painted.

- C. The following schedule shall be used for painting items specified in the following Piping Sections and Valve Sections:

| Item | Painting System No. |
|--|---------------------|
| Exterior ferrous piping | 1 |
| Interior ferrous piping (not specified elsewhere) | 2 |
| Submerged and non-submerged ferrous piping | 7 |

3.6 PIPING SCHEDULE –SEE DRAWINGS FOR PROCESS PIPING

| PIPING SYSTEM | MATERIALS |
|--|--------------|
| Bubbler Tubing | SS |
| Chemical Pipes Polymer Sodium Permanganate | PVC, Tubing |
| Final Effluent Water (E) | Copper, STL |
| Hydraulic Piping | SST |
| Laboratory Drains | P |
| Natural Gas (E) | STL |
| Natural Gas (B) | MDMWPE |
| Non-Potable Water (E) | Copper |
| Non-Potable Water (B) | Copper, D.I. |
| Roof Conductors | PVC |
| Sample Lines | SST |
| Pressate Drain | DIP/PVC |
| Seal Water | Copper |
| Sludge | D.I. |
| Vent | D.I. |
| Wastewater | D.I. |
| Water Main (E) | Copper |
| Water Main (B) Potable Water Industrial Water SFE | D.I. |

Notes:

1. B - Below Grade E – Exposed S-Submerged
2. Piping shall be tested in accordance with local Plumbing Codes and certified.
3. Reinforced Concrete Pipe (RCP) shall be as specified in Division 2.
4. Ductile iron (D.I) water main piping below grade shall be as specified in Division 2.
5. Refer to Section 15400 for miscellaneous plumbing system piping materials.

PRESSURE TEST REPORT FORM

| | |
|----------------|-----------------------------|
| Project: | Date: |
| Contractor: | M T W TH F S |
| Owner: | Job No.: |
| Test Location: | Report No.: |

GENERAL

System To Be Tested: _____

Location of Pipe: _____

Type of Pipe Material: DI/CI Steel Cu PVC HDPE Other _____

Length of Pipe Tested: _____ ft.

SPECIFICATION

Type Of Test: Hydrostatic Pneumatic Other _____

Duration Of Test: _____ hrs

Test Pressure: _____ psi

Pressure / Gallons Loss Allowed: _____ psi/gallons

TEST DATA

| | <u>Pressure</u> | <u>Time</u> |
|----------------|-----------------|---------------|
| Start of Test: | _____ psi | _____ AM / PM |

| | | |
|---------------------|-----------|---------------|
| Completion of Test: | _____ psi | _____ AM / PM |
|---------------------|-----------|---------------|

Pressure / Gallons Lost at Finish: _____ psi/gallon

Results: Pass Fail

SYSTEM TEST PERFORMED BY: _____

Contractor Date

WITNESSED BY: _____

Engineer Date

ACCEPTED BY: _____

Owner Date

END OF SECTION