



City of Canton, GA
**Water Pollution Control Plant
Expansion to 6 MGD**
Contract Documents and Technical Specifications
Bidding Set

Volume 1 of 3

September 2020

ATKINS

Member of the SNC-Lavalin Group

in association with:



Atkins North America, Inc.

COA: #PEF000902

EXP: 06/30/2022

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COA: #PEF007823

EXP: 06/30/2022

Tim Hartwell, PE

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EXPANSION TO 6 MGD
CITY OF CANTON, GEORGIA

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**Canton Water Pollution Control Plant
Expansion to 6 MGD
City of Canton
Canton, Georgia
Project Specifications
Sign and Seal Sheet**

Technical Specifications

Hector M. Casablanca, P.E.

Legal Front Ends



9/28/2020

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City of Canton
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Clifton John Alford, P.E.



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Jeffrey N. Warmington, AIA, LEED® AP



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Tim Hartwell, P.E.



SECTION 00010
ADVERTISEMENT FOR BIDDERS

Sealed Bids will be received by the City of Canton at City Hall located at 110 Academy Street, Canton, GA 30114, until:

10:00 AM local time on Thursday, November 19, 2020
for the Project known as:

**Canton Water Pollution Control Plant
Expansion to 6 MGD**

at which time and place the bids will be publicly opened and read aloud. Bids received after the designated time will not be considered and returned unopened.

The project generally involves the upgrade and expansion of the City's Water Pollution Control Plant (WPCP) from a permitted capacity of 4.0 million gallons per day (MGD) to 6.0 MGD. The following major items are included:

1. Upgrade of headworks and influent splitter box structures to provide odor control and one (1) additional grit removal unit;
2. Addition of a new fine screening facility consisting of two (2) 1-mm screens
3. Addition of four (4) Biological Nutrient Removal (BNR) basins, involving the construction of three (3) new basins and conversion of an existing Sequencing Batch Reactor (SBR) tank;
4. Addition of new Membrane Bioreactor (MBR), including four (4) process trains, permeate pumping, Return Activated Sludge (RAS) transmission and splitter box, Waste Activated Sludge (WAS) transmission and associated chemical addition facilities;
5. Conversion of an existing Sequencing Batch Reactor (SBR) tank for Waste Activated Sludge (WAS) storage;
6. Addition of a new Ultraviolet (UV) Disinfection, post-aeration and effluent measurement structure;
7. Conversion of two (2) SBR tanks to aerobic digesters;
8. Addition of a new solids handling facility to include two (2) belt filter presses, a thermal drying unit and associated appurtenances;
9. Addition of new administration building and laboratory;
10. Associated civil work, yard piping, power supply, electrical system and instrumentation & controls.

Bidders shall inform themselves concerning Georgia Laws and comply with same.

Requests for Bidding Documents, both hard copies and electronic copies must be made to Hector Casablanca via email to hector.casablanca@atkinsglobal.com. Hard copies may be obtained from Atkins North America, Inc., office located at 1600 RiverEdge Parkway NW, Suite 700, Atlanta, Georgia, 30328. A non-refundable payment of \$1,000.00 is required for a

hard copy of the bidding documents and a non-refundable payment of \$150.00 is required for an electronic copy of the bidding documents.

Only general contractors who have been prequalified with the City of Canton are invited to bid. **BIDS FROM OTHER THAN PREQUALIFIED CONTRACTORS WILL NOT BE ACCEPTED.**

A **mandatory pre-bid meeting** for general contractors interested in submitting a bid is scheduled for **Thursday, October 15, 2020 at 9:00 AM** local time at the Canton City Hall located at 110 Academy Street, Canton, GA 30114. After the pre-bid meeting, a site visit to the WPCP will be made. **Bids will not be accepted from those bidders that are not represented at the pre-bid meeting...**

The time allowed for Substantial Completion is **1,215 calendar days**, and the time allowed for Final Completion and readiness for final payment is **1,275 calendar days** from the date of commencement.

Each Bid must be accompanied by a Bid Bond with good and sufficient surety or sureties approved by the City for faithful acceptance of the contract, payable to, in favor of, and for the protection of the City in an amount equivalent to five percent (5%) of the total amount payable by the terms of the contract or, in lieu thereof, a certified check, cashier's check, or cash in equal amount. The successful bidder will be required to furnish the necessary additional Bond(s) as described in the Bidding Documents.

All Bids will remain subject to acceptance for **120 days** after the day of the Bid opening, but City may, in its sole discretion, release any Bid and return the Bid security prior to that date. The Owner reserves the right to reject any or all Bids, to waive informalities and re-advertise.

SECTION 00100
INSTRUCTIONS TO BIDDERS

Article 1 – Defined Terms

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

A. *Bidder* - one who submits a Bid directly to Owner as distinct from a sub-bidder, who submits a bid to a Bidder.

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

C. *Successful Bidder* - the lowest, responsible and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

D. *Owner* - City of Canton, Georgia, party of the first part to the Contract Agreement, or its authorized and legal representatives.

E. *Contractor* - the party of the second part to the Contract Agreement or the authorized and legal representative of such party.

F. *Work and Project* - shall mean the entire complete construction required to be furnished under the Contract Documents.

G. *Products* - shall mean materials or equipment permanently incorporated into the Project.

H. *Provide* - shall mean to furnish and install.

Article 2 – Copies of Bidding Documents

2.1 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. Bidding Documents are open for inspection to prospective bidders at the Issuing

Office for the purpose of review in order to determine if the prospective bidders wish to obtain Bidding Documents.

2.2 Complete sets of Bidding Documents must 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, whether obtained from the Owner, Engineer, Issuing Office, or other sources.

2.3 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

3.1 Owner reserves the right to reject any Bidder who does not satisfy the Owner as to its ability to successfully perform the Work.

3.2 To demonstrate Bidder's qualifications to perform the Work, each Bidder must be prepared to submit within five (5) days after the bid opening upon request written evidence such as financial data, previous experience, present commitments, and such other data as may be requested.

3.3 The Bidder will be required to provide evidence of compliance with the requirements of O.C.G.A. 43-14 (Construction Industry Licensing Board Acts and Rules and Regulations) with respect to the requirements of the code.

3.4 Failure of Bidder to provide such information, within ten (10) days of notification of request, shall be grounds for forfeiting of the bid security of that Bidder.

Article 4 – Examination of Bidding Documents, Other Related Data, and Site

4.1 *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.

4.2 *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.

4.3 *Hazardous Environmental Condition*

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner or Engineer.

4.4 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.

4.5 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.

4.6 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.

Paragraph 6.13.C of the General Conditions indicates that if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.7 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.

4.8 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 – Site and Other Areas

5.1 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 6 – Interpretations and Addenda

6.1 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 (10) 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.

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

Article 7 – Bid Security

7.1 A Bid must be accompanied by Bid security made payable to Owner in an amount of

FIVE percent (5%) 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.

7.2 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.

7.3 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 8 – Contract Times

8.1 The number of days within which, or the dates by which, Milestones are to be achieved and the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

Article 9 – Liquidated Damages

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

Article 10 – Substitute and “Or-Equal” Items

10.1 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 11 – Subcontractors, Suppliers and Others

11.1 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.

11.2 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.

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

Article 12 – Preparation of Bid

12.1 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from the issuing office.

12.2 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.

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

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

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

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

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

12.8 All names shall be printed in ink below the signatures.

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

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

12.11 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 13 – Basis of Bid; Comparison of Bids

13.1 Unit Price

A. Bidders shall submit a Bid on a unit price basis for each item of work set forth in the Bid Form.

B. The total of all estimated prices will be determined as the sum of the products of the estimated quantity of each item and the unit price bid for the item. The final quantities and Contract Price will be determined in accordance with paragraph 11.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

D. 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.

13.2 Conditional bids will NOT be accepted.

Article 14 – Submittal of Bid

14.1 The Bidder is required to furnish the completed Bid Form and the completed Bid Bond Form bound in the Bidding Documents. Additional information required, as indicated, on

the Bid Form shall also be submitted. The technical specifications may be omitted from the documents submitted with the Contractor's bid, but are considered part of the documents.

14.2 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, the Bidders Georgia Utility Contractor's license number 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." Any bid which is not properly prepared and accompanied by proper certifications may be rejected by the Owner.

14.3 Any bid not bearing the bidder's utility contractor license number issued by the State of Georgia Construction Industry Licensing Board, when required by state law, may not be considered by the Owner.

Article 15 – Modification and Withdrawal of Bid

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

15.2 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 16 – Bids to Remain Subject to Acceptance

16.1 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 17 – Evaluation of Bids and Award of Contract

17.1 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.

17.2 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.

17.3 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.

17.4 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.

17.5 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.

17.6 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 18 – Signing of Agreement

18.1 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 19 – Sales and Use Taxes

19.1 Contractor is responsible for all sales and use taxes, and shall include all costs attributable to sales and use taxes in the Bid.

Article 20 – Retainage

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

Article 21 – Security and Immigration Act

21.1 Contractors and Subcontractors who enter into contracts with public employers are required to register and participate in the Federal Work Authorization Program to verify work eligibility information of new employees. Bidders are required to fill out the following forms located in the Bidding Documents attesting to their status under this program and that they will pass on the same requirements to their Subcontractors as required by OCGA 13-10-90 and 13-10-91; GA Department of Labor 300-10-1:

A. Affidavit Verifying Status

B. Security and Immigration Compliance Act Certification

21.2 Pursuant to Code of Georgia 13-10-90 et. seq., the Georgia Security and Immigration Compliance Act of 2006, the following forms located in the Bidding Documents shall be completed prior to Award:

A. Contractor Affidavit and Agreement

B. Subcontractor Affidavit and Agreement

21.3 Contractor understands and agrees that compliance with the requirements of OCGA 13-10-90, OCGA 13-10-91, and Georgia Department of Labor Rule 300-10-1 are conditions of this Agreement.

21.4 Contractor further agrees that such compliance shall be attested by Contractor and its Subcontractors by execution of the appropriate Contractor Affidavit and Agreement and Subcontractor Affidavit forms included in the Contract Documents.

END OF SECTION

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SECTION 00410

BID FORM

PROJECT IDENTIFICATION:

City of Canton, Georgia
Canton WPCP Expansion to 6 MGD

THIS BID IS SUBMITTED TO:

City of Canton, Georgia
110 Academy Street
Canton, GA 30114

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for one hundred and twenty (120) days after the day of Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.
3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

- (a) BIDDER has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda receipt of all which is hereby acknowledged: (List Addenda by Addendum Number and Date)

<u>Addendum No.</u>	<u>Date Received</u>	<u>Addendum No.</u>	<u>Date Received</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, performance and furnishing of the Work, and bidder has not relied upon any oral representations by employees or agents of Owner or Engineer.
- (c) BIDDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.
- (d) BIDDER has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the

Supplementary Conditions as provided in paragraph 4.02 of the General Conditions. BIDDER acknowledges that such reports and drawings are not Contract Documents and may not be complete for BIDDER's purposes. BIDDER acknowledges that OWNER and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site.

- (e) BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto.
 - (f) BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.
 - (g) BIDDER is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.
 - (h) BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
 - (i) BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.
 - (j) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.
4. Unit prices have been computed in accordance with paragraph 11.03 of the General Conditions. All specific cash allowances are included in the price(s) and have been computed in accordance with paragraph 11.02 of the General Conditions.

BIDDER acknowledges that quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents.

5. BIDDER declares that he understands that the quantities shown on the proposal are subject to adjustment by either increase or decrease, and that should the quantities of any of the items of work be increased, the undersigned proposes to do the additional work at the unit prices stated herein; and should the quantities be decreased, he also understands that payment will be made on actual quantities at the unit price bid and will make no claim for anticipated profits for any decrease in the quantities and that actual quantities will be determined upon completion of work, at which time adjustment will be made to the contract amount by direct increase or decrease.
6. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
7. Bidder has not solicited or induced any individual or entity to refrain from bidding
8. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this paragraph:
 - (a) "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
 - (b) "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition
 - (c) "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels
 - (d) "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.
9. BIDDER will complete the Work in accordance with the Contract Documents for the prices listed in the following Bid Schedule.

The remainder of this page is intentionally left blank.

BID SCHEDULE

All bid items shall include all costs for furnishing all labor, materials, equipment, supplies, allowances and all other costs including permit fees, taxes, insurance, miscellaneous costs, overhead and profit incurred for the Work, complete in place and ready for continuous service. Payment shall be in accordance with the General Conditions.

PART 1 – BASE BID

No.	Description	Quantity	Units	Unit Price (in figures)	Total Price (in figures)
1a	Canton Wastewater Treatment Plant Expansion to 6 mgd per Contract Documents including all work shown on the Drawings and as specified, <u>exclusive</u> of those items listed below.	1	LS	\$ _____	\$ _____
1b	Pre-selected equipment, including state sales tax: - Suez MBR system - Veolia sludge dryer	1	LS	<u>\$6,547,500.00</u>	<u>\$6,547,500.00</u>
1c	Stormwater Monitoring Program	42	Months	\$ _____	\$ _____

Total Price Part 1 – Base Bid (Items 1a through 1c): \$ _____

Total Price Part 1 – Base Bid in Words: _____

The amount of Part 1 – Base Bid shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern. In the event of a discrepancy between the unit price bid and the extension, the unit price will be deemed intended by the bidder and the extensions adjusted. In the event of a discrepancy between the sum of the extended amounts and the bid total, the sum of the extended amounts shall govern.

PART 2 – ALLOWANCE COSTS

The Bidder shall include in the Total Bid price the lump sum allowances identified below. Payment will be in accordance with the General Conditions and Division 1. Any unused balance of the allowances shall revert to the Owner upon completion of the project.

Cost Item	Description			Total Allowance Price (in figures)
2a	Allowance for correction of unforeseen utility conflicts and utility relocation			\$50,000
2b	Allowance for Owner initiated miscellaneous work			\$500,000
2c	Allowance for miscellaneous laboratory equipment			\$25,000
2d	Allowance for office equipment and furnishings			\$50,000
2e	Allowance for office computer equipment			\$15,000
2f	Allowance for bulk chemicals for WPCP startup (3-months)			\$15,000
2g	Geotechnical / Materials Testing Allowance			\$150,000
2h	Utility vehicle allowance (to be provided early in project)			\$20,000
2i	Site landscaping			\$100,000
2j	Plant Control System Additional Hardware, Software, and Fees			\$50,000
2k	Additional Electrical Equipment Required by the Power System Study and Harmonic Analysis			\$75,000
2l	Demolition and restoration of existing Sludge Press Building			\$50,000
	Total Allowance Cost Items 2a – 2k			\$1,100,000

Total Allowance Cost in Words: One Million and One Hundred Thousand dollars and zero cents

PART 3 – ADDITIONAL WORK TO BASE BID

The Bidder agrees to furnish unit pricing for items listed below to establish pricing should additional work be required or directed by the Engineer or Owner. The pricing includes all labor and equipment necessary to install complete. Payment will be in accordance with the General Conditions and Division 1. Any unused balance of the unit price items shall revert to the Owner upon completion of the project.

Item	Description	Quantity	Units	Unit Price (in figures)	Total Price (in figures)
3a	Rock Excavation	100	cy	\$ _____	\$ _____
3b	Subgrade Stabilizer, #57 Stone	200	cy	\$ _____	\$ _____
3c	Subgrade Stabilizer, #3 Stone	200	cy	\$ _____	\$ _____
3d	Structural Excavation and Backfill	200	cy	\$ _____	\$ _____
3e	Class A concrete including formwork and reinforcing steel	100	cy	\$ _____	\$ _____
3f	Ductile iron pipe	4	ton	\$ _____	\$ _____
3g	Ductile iron fittings	2	ton	\$ _____	\$ _____
3h	12.5 mm Superpave Asphaltic Concrete w/Bit. Tack Coat	60	tons	\$ _____	\$ _____
3i	Type A Silt Fence	1,000	lf	\$ _____	\$ _____
3j	Type C Silt Fence	1,000	lf	\$ _____	\$ _____
3k	Temporary Grassing	1	acre	\$ _____	\$ _____
3l	Permanent Grassing	1	acre	\$ _____	\$ _____
3m	Rock Check Dams	10	ea	\$ _____	\$ _____
3n	Rock Filter Dam	5	ea	\$ _____	\$ _____
3o	Erosion Control Matting	1,000	sy	\$ _____	\$ _____
3p	Permanent Geotextile Matting	1,000	sy	\$ _____	\$ _____

Item	Description	Quantity	Units	Unit Price (in figures)	Total Price (in figures)
3q	Rip Rap Channel Stabilization	500	sy	\$ _____	\$ _____
3r	Concrete Channel Stabilization (4" thick)	100	sy	\$ _____	\$ _____

Total Price Part 3 – Additional Work to Base Bid (Items 3a through 3r):

\$ _____

Total Price Part 3 – Additional Work in Words:

The amount of Part 3 – Additional Work To Base Bid shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern. In the event of a discrepancy between the unit price bid and the extension, the unit price will be deemed intended by the bidder and the extensions adjusted. In the event of a discrepancy between the sum of the extended amounts and the bid total, the sum of the extended amounts shall govern.

BID SUMMARY

Part 1 Base Bid \$ _____

Part 2 Allowance Items \$ 1,100,000.00

Part 3 Additional Work \$ _____

TOTAL PRICE: \$ _____

TOTAL PRICE IN WORDS: _____

PART 4 – BASE BID MAJOR EQUIPMENT ITEMS

The Total Bid in Part 1 – Base Bid shall include the costs for the circled Manufacturers/Suppliers listed in this Major Equipment Schedule, exclusive of any Alternate Bid Items. Should a Bidder fail to indicate which manufacturer or supplier its Bid is based on, or circle more than one listed manufacturer/supplier per equipment item, the Bidder shall provide the first listed (A) manufacturer/supplier for its Bid for the amount included in the Total Bid at no increase in the Contract amount. The Contractor shall submit working drawings in accordance with the General Conditions and Section 01300 for any modifications to the Contract Drawings required due to the submittal of the base bid manufacturers/suppliers. The Bidder is aware that the Owner will award the Contract without consideration of Alternate manufacturers/suppliers.

The Major Equipment Schedule lists the base bid equipment manufacturer/supplier as applicable for major equipment items and key suppliers for the Project. The Bidder must indicate which named manufacturer/supplier it intends to provide by circling one of the manufacturers/suppliers listed.

Specification Section	Equipment Description	Manufacturer/Supplier
03420	Precast Post-Tensioned Tank	A. Dutchland B. Or approved equal
11200	Submersible Pumps	A. Flygt Corporation B. Homa
11202	Slide Gates	A. Rodney Hunt B. WACO C. Waterman
11220	Compressed Air Mixing System	A. EnviroMix B. Pulsair
11212	Vertical Turbine Pumps	A. Goulds B. Flowserve
11231	Chemical Metering Pumps	A. Guardian Equipment B. Watson Marlow
11237	Ultraviolet Disinfection Equipment	A. Wedeco B. Trojan Technologies, Inc.
11307	Centrifugal Chopper Pump	A. Vaughan B. Hayward Gordon
11311	Horizontal Self-Priming Pumps	A. Trillium Wemco B. Gorman-Rupp
11315	Progressive Cavity Pumps	A. Seepex B. Netzsch
11316	Rotary Lobe Pumps	A. Vogelsang B. Boerger

Specification Section	Equipment Description	Manufacturer/Supplier
11321 ⁽¹⁾	Vortex Grit Chamber and Cyclone Separator	A. Smith & Loveless
11331	Fine Screens and Conveyor	A. Enviro-Care B. Huber
11353	Liquid Polymer Feed Systems	A. Velodyne B. Dynablend
11370	Sludge Dewatering Equipment	A. BDP B. Ashbrook
11372 ⁽¹⁾	Rotary Positive Displacement Blowers	A. Aerzen
11410	Rotary Drum Thickeners	A. Parkson B. Vulcan
11440, 11441, & 11442	Diffused Aeration Equipment	A. Sanitaire B. Environmental Dynamics Int
11500	Odor Control Equipment - Headworks	A. Pure Aire Filtration B. BioRem
11501	Odor Control Equipment – Solids Handling Facility	A. BioAir B. BioRem
11600	Biosolids Storage Hopper	A. JMS B. Spirac
11610	Shaftless Spiral Conveyors	A. Spirac B. Keller Sales C. Keystone Conveyors
13121 & 13122	Pre-Cast Concrete Buildings Modular Precast Concrete Structures	A. Easi-Set Buildings B. Old Castle Concrete
13204	Polyethylene Storage Tanks	A. Poly Processing B. Assmann Corporation
13205	Fiberglass Reinforced Plastic Tanks	A. Augusta Fiberglass B. ECS
16155	Low Voltage Motor Control	A. Eaton B. Square D C. Siemens
16157	Variable Frequency Drives	A. Eaton B. Square D C. Siemens
16161	Switchboard	A. Eaton

Specification Section	Equipment Description	Manufacturer/Supplier
		B. Square D C. Siemens
16165	Switchgear	A. Eaton B. Square D C. Siemens
16942	Control System Equipment	A. Rockwell Automation
16960	HMI System	A. Rockwell Automation

Note: ⁽¹⁾ Equipment specified to match existing equipment in operation

SECTION 00410

BID FORM

PROJECT IDENTIFICATION:

City of Canton, Georgia
Canton WPCP Expansion to 6 MGD

THIS BID IS SUBMITTED TO:

City of Canton, Georgia
110 Academy Street
Canton, GA 30114

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for one hundred and twenty (120) days after the day of Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.
3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

- (a) BIDDER has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda receipt of all which is hereby acknowledged: (List Addenda by Addendum Number and Date)

<u>Addendum No.</u>	<u>Date Received</u>	<u>Addendum No.</u>	<u>Date Received</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, performance and furnishing of the Work, and bidder has not relied upon any oral representations by employees or agents of Owner or Engineer.
- (c) BIDDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.
- (d) BIDDER has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the

Supplementary Conditions as provided in paragraph 4.02 of the General Conditions. BIDDER acknowledges that such reports and drawings are not Contract Documents and may not be complete for BIDDER's purposes. BIDDER acknowledges that OWNER and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site.

- (e) BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto.
 - (f) BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.
 - (g) BIDDER is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.
 - (h) BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
 - (i) BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.
 - (j) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.
4. Unit prices have been computed in accordance with paragraph 11.03 of the General Conditions. All specific cash allowances are included in the price(s) and have been computed in accordance with paragraph 11.02 of the General Conditions.

BIDDER acknowledges that quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents.

5. BIDDER declares that he understands that the quantities shown on the proposal are subject to adjustment by either increase or decrease, and that should the quantities of any of the items of work be increased, the undersigned proposes to do the additional work at the unit prices stated herein; and should the quantities be decreased, he also understands that payment will be made on actual quantities at the unit price bid and will make no claim for anticipated profits for any decrease in the quantities and that actual quantities will be determined upon completion of work, at which time adjustment will be made to the contract amount by direct increase or decrease.
6. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
7. Bidder has not solicited or induced any individual or entity to refrain from bidding
8. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this paragraph:
 - (a) "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
 - (b) "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition
 - (c) "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels
 - (d) "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.
9. BIDDER will complete the Work in accordance with the Contract Documents for the prices listed in the following Bid Schedule.

The remainder of this page is intentionally left blank.

BID SCHEDULE

All bid items shall include all costs for furnishing all labor, materials, equipment, supplies, allowances and all other costs including permit fees, taxes, insurance, miscellaneous costs, overhead and profit incurred for the Work, complete in place and ready for continuous service. Payment shall be in accordance with the General Conditions.

PART 1 – BASE BID

No.	Description	Quantity	Units	Unit Price (in figures)	Total Price (in figures)
1a	Canton Wastewater Treatment Plant Expansion to 6 mgd per Contract Documents including all work shown on the Drawings and as specified, <u>exclusive</u> of those items listed below.	1	LS	\$ _____	\$ _____
1b	Pre-selected equipment, including state sales tax: - Suez MBR system - Veolia sludge dryer	1	LS	<u>\$6,547,500.00</u>	<u>\$6,547,500.00</u>
1c	Stormwater Monitoring Program	42	Months	\$ _____	\$ _____

Total Price Part 1 – Base Bid (Items 1a through 1c): \$ _____

Total Price Part 1 – Base Bid in Words: _____

The amount of Part 1 – Base Bid shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern. In the event of a discrepancy between the unit price bid and the extension, the unit price will be deemed intended by the bidder and the extensions adjusted. In the event of a discrepancy between the sum of the extended amounts and the bid total, the sum of the extended amounts shall govern.

PART 2 – ALLOWANCE COSTS

The Bidder shall include in the Total Bid price the lump sum allowances identified below. Payment will be in accordance with the General Conditions and Division 1. Any unused balance of the allowances shall revert to the Owner upon completion of the project.

Cost Item	Description			Total Allowance Price (in figures)
2a	Allowance for correction of unforeseen utility conflicts and utility relocation			\$50,000
2b	Allowance for Owner initiated miscellaneous work			\$500,000
2c	Allowance for miscellaneous laboratory equipment			\$25,000
2d	Allowance for office equipment and furnishings			\$50,000
2e	Allowance for office computer equipment			\$15,000
2f	Allowance for bulk chemicals for WPCP startup (3-months)			\$15,000
2g	Geotechnical / Materials Testing Allowance			\$150,000
2h	Utility vehicle allowance (to be provided early in project)			\$20,000
2i	Site landscaping			\$100,000
2j	Plant Control System Additional Hardware, Software, and Fees			\$50,000
2k	Additional Electrical Equipment Required by the Power System Study and Harmonic Analysis			\$75,000
2l	Demolition and restoration of existing Sludge Press Building			\$50,000
	Total Allowance Cost Items 2a – 2k			\$1,100,000

Total Allowance Cost in Words: One Million and One Hundred Thousand dollars and zero cents

PART 3 – ADDITIONAL WORK TO BASE BID

The Bidder agrees to furnish unit pricing for items listed below to establish pricing should additional work be required or directed by the Engineer or Owner. The pricing includes all labor and equipment necessary to install complete. Payment will be in accordance with the General Conditions and Division 1. Any unused balance of the unit price items shall revert to the Owner upon completion of the project.

Item	Description	Quantity	Units	Unit Price (in figures)	Total Price (in figures)
3a	Rock Excavation	100	cy	\$ _____	\$ _____
3b	Subgrade Stabilizer, #57 Stone	200	cy	\$ _____	\$ _____
3c	Subgrade Stabilizer, #3 Stone	200	cy	\$ _____	\$ _____
3d	Structural Excavation and Backfill	200	cy	\$ _____	\$ _____
3e	Class A concrete including formwork and reinforcing steel	100	cy	\$ _____	\$ _____
3f	Ductile iron pipe	4	ton	\$ _____	\$ _____
3g	Ductile iron fittings	2	ton	\$ _____	\$ _____
3h	12.5 mm Superpave Asphaltic Concrete w/Bit. Tack Coat	60	tons	\$ _____	\$ _____
3i	Type A Silt Fence	1,000	lf	\$ _____	\$ _____
3j	Type C Silt Fence	1,000	lf	\$ _____	\$ _____
3k	Temporary Grassing	1	acre	\$ _____	\$ _____
3l	Permanent Grassing	1	acre	\$ _____	\$ _____
3m	Rock Check Dams	10	ea	\$ _____	\$ _____
3n	Rock Filter Dam	5	ea	\$ _____	\$ _____
3o	Erosion Control Matting	1,000	sy	\$ _____	\$ _____
3p	Permanent Geotextile Matting	1,000	sy	\$ _____	\$ _____

Item	Description	Quantity	Units	Unit Price (in figures)	Total Price (in figures)
3q	Rip Rap Channel Stabilization	500	sy	\$ _____	\$ _____
3r	Concrete Channel Stabilization (4 inches thick)	100	sy	\$ _____	\$ _____
3s	1.5-inch Mill and Resurface	100	sy	\$ _____	\$ _____

Total Price Part 3 – Additional Work to Base Bid (Items 3a through 3r):

\$ _____

Total Price Part 3 – Additional Work in Words:

The amount of Part 3 – Additional Work To Base Bid shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern. In the event of a discrepancy between the unit price bid and the extension, the unit price will be deemed intended by the bidder and the extensions adjusted. In the event of a discrepancy between the sum of the extended amounts and the bid total, the sum of the extended amounts shall govern.

BID SUMMARY

Part 1 Base Bid \$ _____

Part 2 Allowance Items \$ 1,100,000.00

Part 3 Additional Work \$ _____

TOTAL PRICE: \$ _____

TOTAL PRICE IN WORDS: _____

PART 4 – BASE BID MAJOR EQUIPMENT ITEMS

The Total Bid in Part 1 – Base Bid shall include the costs for the circled Manufacturers/Suppliers listed in this Major Equipment Schedule, exclusive of any Alternate Bid Items. Should a Bidder fail to indicate which manufacturer or supplier its Bid is based on, or circle more than one listed manufacturer/supplier per equipment item, the Bidder shall provide the first listed (A) manufacturer/supplier for its Bid for the amount included in the Total Bid at no increase in the Contract amount. The Contractor shall submit working drawings in accordance with the General Conditions and Section 01300 for any modifications to the Contract Drawings required due to the submittal of the base bid manufacturers/suppliers. The Bidder is aware that the Owner will award the Contract without consideration of Alternate manufacturers/suppliers.

The Major Equipment Schedule lists the base bid equipment manufacturer/supplier as applicable for major equipment items and key suppliers for the Project. The Bidder must indicate which named manufacturer/supplier it intends to provide by circling one of the manufacturers/suppliers listed.

Specification Section	Equipment Description	Manufacturer/Supplier
03420	Precast Post-Tensioned Tank	A. Dutchland B. Or approved equal
11200	Submersible Pumps	A. Flygt Corporation B. Homa
11202	Slide Gates	A. Rodney Hunt B. WACO C. Waterman
11220	Compressed Air Mixing System	A. EnviroMix B. Pulsair
11212	Vertical Turbine Pumps	A. Goulds B. Flowserve
11231	Chemical Metering Pumps	A. Guardian Equipment B. Watson Marlow
11237	Ultraviolet Disinfection Equipment	A. Wedeco B. Trojan Technologies, Inc.
11307	Centrifugal Chopper Pump	A. Vaughan B. Hayward Gordon
11311	Horizontal Self-Priming Pumps	A. Trillium Wemco B. Gorman-Rupp
11315	Progressive Cavity Pumps	A. Seepex B. Netzsch
11316	Rotary Lobe Pumps	A. Vogelsang B. Boerger

Specification Section	Equipment Description	Manufacturer/Supplier
11321 ⁽¹⁾	Vortex Grit Chamber and Cyclone Separator	A. Smith & Loveless
11331	Fine Screens and Conveyor	A. Enviro-Care B. Huber
11353	Liquid Polymer Feed Systems	A. Velodyne B. Dynablend
11370	Sludge Dewatering Equipment	A. BDP B. Ashbrook
11372 ⁽¹⁾	Rotary Positive Displacement Blowers	A. Aerzen
11410	Rotary Drum Thickeners	A. Parkson B. Vulcan
11440, 11441, & 11442	Diffused Aeration Equipment	A. Sanitaire B. Environmental Dynamics Int
11500	Odor Control Equipment - Headworks	A. Pure Aire Filtration B. BioRem
11501	Odor Control Equipment – Solids Handling Facility	A. BioAir B. BioRem
11600	Biosolids Storage Hopper	A. JMS B. Spirac
11610	Shaftless Spiral Conveyors	A. Spirac B. Keller Sales C. Keystone Conveyors
13121 & 13122	Pre-Cast Concrete Buildings Modular Precast Concrete Structures	A. Easi-Set Buildings B. Old Castle Concrete
13204	Polyethylene Storage Tanks	A. Poly Processing B. Assmann Corporation
13205	Fiberglass Reinforced Plastic Tanks	A. Augusta Fiberglass B. ECS
16155	Low Voltage Motor Control	A. Eaton B. Square D C. Siemens
16157	Variable Frequency Drives	A. Eaton B. Square D C. Siemens
16161	Switchboard	A. Eaton

Specification Section	Equipment Description	Manufacturer/Supplier
		B. Square D C. Siemens
16165	Switchgear	A. Eaton B. Square D C. Siemens
16942	Control System Equipment	A. Rockwell Automation
16960	HMI System	A. Rockwell Automation

Note: ⁽¹⁾ Equipment specified to match existing equipment in operation

10. BIDDER agrees that the Work will be substantially complete within **1,215 calendar 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 **1,275 calendar days** after the date when the Contract Times commence to run.

BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the time(s) specified in the Agreement.

11. The following documents are attached to and made a condition of this Bid:
- (a) Required Bid Security in the form of Bid Bond, Certified Check, Cashier's Check, or Cash. (*Strikeout inapplicable terms*)
 - (b) Bidders who submit Bid Security in the form of a Certified check, Cashier's Check, or Cash are bound by the "Terms of Bid Bond" as if submitted on the attached "Bid Bond "form.

The address of BIDDER indicated below.

BIDDER'S NAME

Primary Contact Person: _____

Secondary Contact Person: _____

Bidder's Street Address: _____

Bidder's Mailing Address: _____

(if different) _____

Bidder's Phone No.: _____

Bidder's Fax No.: _____

e-mail address: _____

12. Terms used in this Bid which are defined in the General Conditions or Instructions will have the meanings indicated in the General Conditions or Instructions.

THIS BID SUBMITTED on _____, 20 _____

If BIDDER is:

An Individual

Name (typed or printed): _____

By: _____ (SEAL)
(Individual's signature)

Doing business as _____

Business address: _____

Phone No.: _____ FAX No.: _____

e-mail address: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(Signature of General Partner)

Name (typed or printed): _____

Business address: _____

Phone No.: _____ FAX No.: _____

e-mail address: _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

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

By: _____
(Signature)

Name (typed or printed): _____

Title: _____

Attest: _____ (CORPORATE SEAL)
(Signature)

Business Address: _____

Phone No.: _____ FAX No.: _____

e-mail address: _____

Date of Qualification to do business is _____

A Joint Venture

Joint Venture Name: _____ (SEAL)

By: _____
(Signature of joint venture partner)

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone No.: _____ FAX No.: _____

Joint Venture Name: _____ (SEAL)

By: _____
(Signature of joint venture partner)

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone No.: _____ FAX No.: _____

e-mail address: _____

(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).

SECTION 00430

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):

City of Canton
110 Academy Street
Canton, GA 30114

BID

Bid Due Date: _____

PROJECT (Brief Description Including Location)

The project generally involves the upgrade and expansion of the City's Water Pollution Control Plant (WPCP) from a permitted capacity of 4.0 million gallons per day (MGD) to 6.0 MGD. The plant is located in Canton, Georgia at 1078 Marietta Highway, Canton, GA 30114.

BOND

Bond Number: _____

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

Penal Sum _____

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.

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.

BIDDER

SURETY

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

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SECTION 00520

AGREEMENT

THIS AGREEMENT made by and between the City of Canton, Georgia (hereinafter called Owner) and _____ (hereinafter called Contractor).

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 – WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Canton WPCP Expansion to 6 MGD. The project generally involves the upgrade and expansion of the City's Water Pollution Control Plant (WPCP) from a permitted capacity of 4.0 million gallons per day (MGD) to 6.0 MGD.

ARTICLE 2 – ENGINEER

Atkins North America, Inc. will act as 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 3 – CONTRACT TIMES

3.01 *Days to Achieve Substantial Completion and Final Payment.* The work will be substantially completed within 1,215 calendar 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 1,275 calendar days after the date when the contract times commence to run.

3.02 *Liquidated Damages.* Contractor and Owner recognize that time is of the essence as stated in paragraph 3.01 above and that owner will suffer financial loss if the work is not completed within the times specified in paragraph 3.01 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 \$3,000 (three thousand dollars) for each day that expires after the time specified in paragraph 3.01 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 (one thousand and five hundred dollars) for each day that expires after the time specified

in paragraph 3.01 above for completion and readiness for final payment until the work is completed and ready for final payment.

ARTICLE 4 – CONTRACT PRICE

4.01 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 4.01.A below:

A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 5 – PAYMENT PROCEDURES

5.01 *Submittal and Processing of Payments* 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.

5.02 *Progress Payments; Retainage* Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the **25th** day of each month during performance of the Work as provided in Paragraph 5.02.A below.

A. 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) plus the value of materials and equipment suitably stored, insured, and protected at the construction site, and with the Owner's consent, such materials and equipment suitably stored, insured, and protected off-site at a location approved by the Engineer, less a retainage of ten percent (10%) of each progress payment requested; provided, however, when fifty percent (50%) of the Contract Price, including change orders and other additions to the Contract, is due and the manner of completion of the contract work and its progress is reasonably satisfactory to the Engineer, in the Engineer's sole discretion, the Owner shall withhold no more retainage on additional work completed. The Contractor shall be entitled to withhold retainage from subcontractors in accordingly. At the discretion of the Owner, upon recommendation of the Engineer and with consent of the Contractor, the retainage of each subcontractor may be released separately as the subcontractor completes his work.

B. If, after discontinuing the retainage, the Engineer determines that the work is unsatisfactory or has fallen behind schedule, retention shall be resumed at the previous level. If retention is resumed, the Contractor shall be entitled to resume withholding retainage from any affected subcontractors.

5.03 *Final Payment.*

A. At substantial completion of the contract work and as the Engineer determines the work to be reasonably satisfactory, the Owner shall within 30 days after presentation of Application and other appropriate documentation as required by Article 14 of the General Conditions are provided, pay the retainage to the Contractor. If at that time there are any remaining incomplete minor items, an amount equal to 200 percent of the value of each item, as determined by the Engineer, shall be withheld until such item or items are completed. The reduced retainage shall be shared by the Contractor and subcontractors as their interests may appear. The Contractor shall, within ten (10) days

from Contractor's receipt of retainage from the Owner, pass through payments to subcontractors and shall reduce each subcontractor's retainage in the same manner as the Contractor's retainage is reduced by the Owner provided that the value of each subcontractor's work complete and in place equals fifty percent (50%) of his subcontract value, including approved change orders and other additions to the subcontract value and provided, further, that the work of the subcontractor is proceeding satisfactorily and the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the Contractor in his reasonable discretion may require, including, but not limited to a payment and performance bond.

- B. The subcontractor shall, within ten (10) days from the subcontractor's receipt of retainage from the Contractor, pass through payments to the lower tier subcontractors and shall reduce each lower tier subcontractor's retainage in the same manner as the subcontractor's retainage is reduced by the Contractor, provided that the value of each lower tier subcontractor's work complete and in place equals fifty (50%) percent of his subcontract value, including approved change orders and other additions to the subcontract value and provided, further, that the work of the lower tier subcontractor is proceeding satisfactorily and the lower tier subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the subcontractor in his reasonable discretion may require, including, but not limited to, a payment and performance bond.
- C. All prior certificates or estimates upon which payments have been made are approximate only, and subject to correction in the final payment.

5.04 *Contractor's Agreements with Subcontractors.* The Contractor hereby covenants and agrees with Owner to obtain written agreements from each subcontractor setting forth payment procedures in accordance with the foregoing provisions of this Section. Nothing contained herein shall preclude the Contractor, prior to making payment to a subcontractor, from requiring the payee to submit satisfactory evidence that all payrolls, material bills, and other indebtedness connected with the work have been paid.

ARTICLE 6 – INTEREST

- 6.01 The Current Market Rate for this Agreement shall be the interest rate for the “Georgia Fund 1” managed by the State Office of Georgia Office of Treasury and Fiscal Services or a pro-rata portion on the principal balance.
- 6.02 All moneys not paid by Owner to Contractor when due as provided in Article 14 of the General Conditions shall bear interest at the Current Market Rate.
- 6.03 On contracts relating to installation, extension, improvement, maintenance or repair of any water or sewer facility, retainage shall be invested at the Current Market Rate and any interest earned on the retained amount shall be paid to the Contractor when the project has been completed within the Contract Times and for the Contract Price specified in the Contract, or in any amendments or change orders approved in accord with the terms of the Contract.

ARTICLE 7 – CONTRACTOR’S REPRESENTATIONS

- 7.01 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
 - 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 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 8 – CONTRACT DOCUMENTS

8.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 00520-1 to 00520-7, inclusive).

2. Performance Bond (pages 00610-1 to 00610-3, inclusive).
 3. Payment Bond (pages 00615-1 to 00615-3, inclusive).
 4. Standard General Conditions (pages 00700-1 to 00700-43, inclusive).
 5. Supplementary Conditions (pages 00800-1 to 00800-8, inclusive).
 6. Specifications bearing the title: *Canton WPCP Expansion to 6 MGD*
 7. Drawings consisting of all sheets with each bearing the following general title:
Canton WPCP Expansion to 6 MGD
 8. Addenda (numbers 1 to , inclusive).
 9. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages 00410-1 to 00410-15, inclusive).
 - b. Documentation submitted by Contractor prior to Notice of Award
 - c. Other exhibits or certifications (if applicable) accompanying this Agreement..
 10. 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 (pages _____ to _____, inclusive).
 - 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 9 – MISCELLANEOUS

9.01 Terms

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

9.02 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.

9.03 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.

9.04 *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.

9.05 *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.

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 Canton, GA

By:

By:

Typed Name

Typed Name

Title

Title

Signature

Signature

[SEAL]

[SEAL]

Attest:

Attest:

Signature

Signature

Title

Title

Address for Giving Notice:

Address for Giving Notice:

City of Canton

110 Academy Street

Canton, GA 30114

Approved as to form

Robert M. Dyer,
Attorney, City of Canton

(Attach evidence of authority to sign and resolution or other documents authorizing execution of Agreement)

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SECTION 00610
PERFORMANCE BOND

CONTRACTOR *(name and address):*

SURETY *(name and address of principal place of business):*

OWNER *(name and address):*

City of Canton
110 Academy Street
Canton, GA 30114

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

Canton WPCP Expansion to 6 MGD
1078 Marietta Highway, Canton, GA 30114

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract):*

Amount:

Modifications to this Bond Form: None See Paragraph 16

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

(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

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

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

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

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

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

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

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the

Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

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

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price 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

the Owner or its heirs, executors, administrators, successors, and assigns.

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

11. Any proceeding, legal or equitable, under this Bond 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 a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

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

14. Definitions

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

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

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

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

to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

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SECTION 00615
PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

City of Canton, GA
110 Academy Street
Canton, GA 30114

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

Canton WPCP Expansion to 6 MGD
1078 Marietta Highway, Canton, GA 30114

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form: None See Paragraph 18

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

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and

all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

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

18. Modifications to this Bond are as follows:

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SECTION 00700
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° 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, material man, 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:
 2. does not conform to the Contract Documents; or
 3. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 4. 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).
5. Furnish, Install, Perform, Provide:
6. 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.
7. 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.

8. 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.
9. 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.
10. 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;

5. 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.

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SECTION 00800
SUPPLEMENTARY CONDITIONS

The Standard General Conditions of the Construction Contract and other provisions of the Contract Documents are amended or supplemented by these Supplementary Conditions as indicated below. All provisions of the Standard General Conditions, which are not so amended or supplemented, remain in full force and effect. The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions.

S.C.-2.02.A.

Delete paragraph 2.02 of the General Conditions in its entirety and insert the following in its place:

A. OWNER shall furnish to CONTRACTOR up to six copies of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

S.C.-3.01.C.

Add the following new paragraph immediately after paragraph 3.01.C. of the General Conditions, which is to read as follows:

D. The Drawings are intended to conform and agree with the Specifications; if, however discrepancies occur, the ENGINEER will decide which shall govern. Special specifications stated on the Drawings govern that particular piece of Work and have equal weight and importance as the printed specifications. In the event of any discrepancies between the Drawings and the figures written thereon, the figures are to be taken as correct.

S.C.-4.05.A.

Add the following new paragraphs immediately after paragraph 4.05.A. of the General Conditions, which is to read as follows:

B. It will be the CONTRACTOR'S responsibility to flag, protect, or provide offset references for the remonumentation of any property corners or rights-of-way markers that are disturbed by the Work on the Project. In the even these markers are damaged or removed, it will be the CONTRACTOR'S responsibility to re-establish those markers that were present prior to Work on the project.

C. It shall be the CONTRACTOR'S responsibility to verify all reference points shown on the Contract Documents prior to beginning

Work on the site. This verification shall be conducted by professionally qualified personnel in a manner that will verify the accuracy of the information shown in the Contract Documents. On projects that involve the connection to, or additions to existing structures, the elevations of existing structures shall also be verified. Any finding that differs from information shown on the Contract Documents shall be submitted to the ENGINEER for resolution.

D. Additional surveys necessary for the construction staking shall be performed by the CONTRACTOR, the cost of which shall be incorporated into the appropriate items of Work. On projects in which payment is classified by depth of cut, the construction staking shall be performed in a manner that will allow for the determination of cut classification if the classification is to be other than what is shown in the Contract Documents. During construction of the project, the CONTRACTOR shall keep a daily log and record of the location of all underground pipes, all structures, and any deviation from the plans. The CONTRACTOR shall keep and furnish this daily log and record in a manner that will allow the ENGINEER to incorporate these items into the Contract Documents.

S.C.-5.01.A.

In paragraph 5.01.A. of the General Conditions, delete the phrase "becomes due" and replace it with "is made by the OWNER".

S.C.-5.01.B.

Delete paragraph 5.01.B. of the General Conditions in its entirety and insert the following in its place:

B. All Bonds shall be in the form prescribed by the Contract Documents. The surety shall hold a current certificate of authority to transact business in Georgia from the Georgia Insurance Commissioner, or in lieu thereof the OWNER may require that the surety be named on the current list

of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 by the U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent’s authorization to act for the surety.

S.C.-5.01.C

In paragraph 5.01.C. of the General Conditions, delete the number “20” and replace it with “10”. Also add the following new sentences to the end of the paragraph:

The OWNER may stop all work on the project until the new or additional bonds are furnished. If the bonds are not provided within the ten-day period, the OWNER may terminate the contract. Additionally, the OWNER may complete the project as the agent of, and at the expense of, the CONTRACTOR and his or her sureties in accordance with O.C.G.A. 36-91-40(b).

S.C.-5.04.B.6.

Add the following new paragraph immediately after paragraph 5.04.B.6. of the General Conditions, which is to read as follows:

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. Worker’s Compensation and related coverages under paragraphs 5.04.A.1 and A.2. of the General Conditions:
 - a. State:..... Statutory Limit
 - b. Federal:..... Statutory Limit
 - c. Employer’s Liability:\$1,000,000
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 Operation Aggregate:\$2,000,000
 - c. Personal & 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 Underground coverages where applicable.
3. Automobile Liability under paragraph 5.04.A.6 of the General Conditions:
 - a. Bodily Injury:
 - 1) Each Person: \$1,000,000
 - 2) Each Accident: \$1,000,000
 - b. Property Damage
 - 1) Each Accident: \$1,000,000OR
 - c. Combined Single Limit of:..... \$2,000,000

S.C.-6.02.B.

Add the following new paragraph immediately after paragraph 6.02.B. of the General Conditions, which is to read as follows:

C. Regular working hours for this project are Monday through Friday between the times of 7:00 A.M. and 6:00 P.M. Approval for work outside of regular working hours requires City Council approval, and work performed beyond regular working hours shall be done at no additional cost to OWNER. CONTRACTOR shall reimburse OWNER for all extra costs associated with such work including additional support services, engineering services, inspection services, testing services, utilities or other applicable costs. The ENGINEER will determine the extent of additional services needed due to CONTRACTOR’S working outside regular work hours.

S.C.-6.06.B.

B. If the Bid or Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other persons or organizations (including those who are to furnish the principal items of materials or equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by OWNER and ENGINEER, and if CONTRACTOR has submitted a list thereof in accordance with the Bid or Supplementary Conditions, OWNER’S or ENGINEER’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 person or

organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute at no charge in Contract Price. No acceptance by OWNER or ENGINEER of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or ENGINEER to reject defective work.

S.C.-6.06.G.

Add the following new paragraph immediately after paragraph 6.06.G. of the General Conditions, which is to read as follows:

H. If more than twenty-five percent of the work (as measured by dollar value and not including specialty work that is customarily subcontracted) is to be performed by one or more subcontractors then CONTRACTOR is obligated to notify OWNER in writing of this intent with the submission of the Bid and to provide such supplemental information within five days of the bid as outlined herein under Section 11 of INSTRUCTIONS TO BIDDERS.

S.C.-6.10.A.

Add the following new paragraph immediately after paragraph 6.10.A. of the General Conditions, which is to read as follows:

B. When applicable, the CONTRACTOR shall provide a written tabulation, plus other documentation as may be required, of all taxes, including sales tax, paid by the CONTRACTOR. This is to assist the OWNER in obtaining sales and/or use tax refunds for eligible machinery and equipment used for the primary purpose of reducing or eliminating air or water pollution as provided for in Chapter 48-8-3 (36) and (37) of the Official Code of Georgia. Such written tabulation shall be included with each partial payment request. Any refunds will accrue to the OWNER.

S.C.-6.13.B

Add the following new paragraph immediately after paragraph 6.13.B. of the General Conditions, which is to read as follows:

C. All property affected by work on the project shall be replaced or restored to a condition

as good as when the CONTRACTOR entered upon the Work. In case of failure on the part of the CONTRACTOR to restore such property, or make good such damages or injury, the OWNER may, after 48 hours written notice, or sooner in the case of an emergency, proceed to repair, rebuild, or otherwise restore such property, improvements or facilities as may be deemed necessary. The cost thereof will be deducted from any monies due or which may become due the CONTRACTOR under this Contract.

S.C.-6.17.D.3.

Add the following new paragraph immediately after paragraph 6.17.D.3. of the General Conditions, which is to read as follows:

4. If more than two reviews of the same submittal are required of the ENGINEER or other representative of the OWNER due to unverified, incomplete, inaccurate, erroneous or nonconforming Submittals, then the CONTRACTOR shall be responsible for the reimbursement of the ENGINEER, the OWNER or his representative for the cost of said reviews. The occurrence of such submittals shall be deemed a failure to comply with General Conditions paragraphs 6.01.A and 6.06.A.

S.C.-7.02

Delete paragraph 7.02 of the General Conditions in its entirety and insert the following in its place:

7.02 Coordination

A. If OWNER contracts with others for the performance of other work on the Project site, the CONTRACTOR shall attend and participate in coordination meetings with the other on-site Contractors.

B. Should CONTRACTOR cause damage to the work or property of any separate of contractor at the site, or should any claim arising out of or resulting from CONTRACTOR'S performance of the Work at the site be made by any separate contractor against CONTRACTOR, OWNER, ENGINEER or ENGINEER'S Consultants or any other person, CONTRACTOR shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by mediation, arbitration, or at the law. CONTRACTOR shall, to the fullest extent

permitted by Laws and Regulations, indemnify and hold OWNER, ENGINEER and ENGINEER'S Consultants and the officers, directors, employees, agents, and other consultants of each and any of them harmless 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 directly, indirectly or consequentially out of or resulting from any action, legal or equitable, brought by a separate contractor against OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agents, or other consultants of each and any of them to the extent based on a claim caused by, arising out of, or resulting from CONTRACTOR'S performance of Work. Should a separate contractor cause damage to the Work or property of CONTRACTOR or should the performance of work by any separate contractor at the site give rise to any other claim, CONTRACTOR shall not institute any action, legal or equitable, against OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agents, or other consultants of each and any of them or permit any action against any of them to be maintained and continued in its name for its benefit in any court or before any mediator or arbitrator which seeks to impose liability on or to recover damages from OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agents, or other consultants of each and any of them on account of any such damage or claim. If CONTRACTOR is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and OWNER and CONTRACTOR are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, CONTRACTOR may make a claim for an extension of time in accordance with Article 12. An extension of the Contract Times shall be CONTRACTOR'S exclusive remedy with respect to OWNER, ENGINEER, or ENGINEER'S Consultants or the officers, directors, employees, agents, or other consultants of each and any of them for any delay, disruption, interference or hindrance caused by any separate contractor. This paragraph does not prevent recovery from OWNER, ENGINEER, or

ENGINEER'S Consultants or the officers, directors, employees, agent, or other consultants of each and any of them for activities that are their respective responsibilities.

S.C.-8.02.A.

In paragraph 8.02.A. of the General Conditions, delete the phrase "...to whom CONTRACTOR makes no reasonable objection,..."

S.C.-9.03.A.

Add the following new paragraph immediately after paragraph 9.03.A. of the General Conditions, which is to read as follows:

B. The Resident Project Representative will be authorized to review the Work and products furnished, but the Resident Project Representatives will not be authorized to alter or waive any requirements of the Contract Documents.

S.C.-9.10.A.

Add the following supplement to paragraph 9.10.A. in the General Conditions, which is to read as follows:

CONTRACTORS, Subcontractors, Suppliers and others on the Project, or their sureties, shall maintain no direct action against the ENGINEER or other representatives of the OWNER for any claim arising out of, in connection with, or resulting from the engineering or other services performed for OWNER. Only the OWNER will be the beneficiary of any undertaking by the ENGINEER or other representatives of the OWNER.

S.C.-11.01.A.1.

In paragraph 11.01.A.1 of the General Conditions, delete the word "bonuses."

S.C.-12.01.C.2.f.

Add the following new paragraph immediately after the paragraph 12.01.C.2.f. of the General Conditions, which is to read as follows:

g. Except the total aggregate fees paid the CONTRACTOR and all lower tiered Subcontractors shall not exceed 26.8 percent of the cost of the work.

S.C.-12.02.B.

Add the following new paragraph immediately after paragraph 12.02.B. of the General Conditions, which is to read as follows:

C. The CONTRACTOR shall proceed with the Work at a rate of progress, which will insure completion within the Contract Time. It is expressly understood and agreed by and between the CONTRACTOR and the OWNER that the Contract Time of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions, and other factors prevailing in the locality of the Work. If the CONTRACTOR shall fail to perform the Work required within the Contract Time, or extended Contract Time if authorized by Change order, then the CONTRACTOR shall pay to the OWNER the full amount of liquidated damages specified in the Contract Documents for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the Contract Documents.

S.C.-12.03.A.

In paragraph 12.03.A. of the General Conditions, delete the phrase "...fires, floods, epidemics, abnormal weather conditions or acts of God." and replace it with "...fires, floods, quarantine restrictions, strikes, freight embargoes, epidemics, abnormal and unforeseeable weather conditions of acts of God."

S.C.-14.02.C.

Delete paragraph 14.02.C. of the General Conditions in its entirety and insert the following in its place:

C. Prompt Payment Clause

1. Owner and Contractor agree that all partial payments and final payments shall be subject to the Georgia Prompt Pay Act, as originally enacted and amended, and as set forth in O.C.G.A. 13-11-1 through 13-11-11, except as provided below to the extent authorized by law:
2. Interest Rate: For purposes of computing interest on late payments, the rate of interest shall be one-half percent per month or a pro-rata fraction thereof on the unpaid balance as may be due.
3. Payment Periods:

a) When the Contractor has performed in accordance with the provisions of these Contract Documents, the Owner shall pay the Contractor within 45 days of receipt by the Owner or the Owner's representative of any properly completed Application for Payment, based upon work completed or service provided pursuant to the terms of these Contract Documents.

4. When a subcontractor has performed in accordance with the provisions of its subcontract and the subcontract conditions precedent to payment have been satisfied, the Contractor shall pay to that subcontractor and each subcontractor shall pay to its subcontractor, within ten days of receipt by the Contractor or subcontractor of each periodic or final payment, the full amount received for such subcontractors work and materials based on work completed or service provided under the subcontract, less retainage expressed as a percentage, but such retainage shall not exceed that retainage being held by the Owner, provided that the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete its work as the Contractor in its reasonable discretion may require, including but not limited to a payment and performance bond.

5. Interest on Late Payment: Except otherwise provided in these Contract Documents and/or in O.C.G.A. 13-11-5, if a periodic or final payment to the Contractor is delayed by more than the time allotted in Paragraph b. of this Prompt Payment Clause or if a periodic or final payment to a subcontractor is delayed more than ten days after receipt of periodic or final payment by the Contractor or subcontractor, the Owner, Contractor, or subcontractor, as the case may be, shall pay interest to its Contractor, or subcontractor beginning on the day following the due dates as provided in Paragraph b. of this Prompt Payment Clause

at the rate of interest as provided herein. Interest shall be computed per month or a pro-rata fraction thereof on the unpaid balance. There shall be no compounded interest. No interest is due unless the person or entity being charged interest received "Notice" as provided in Paragraph d. of this Prompt Payment Clause. Acceptance of progress payments or final payment shall release all claims for interest on said payments.

6. Notice of Late Payment and Request of Interest: Any person or entity asserting entitlement to interest on any periodic or final payment pursuant to the provisions of this Prompt Payment Clause shall provide "notice" to the person or entity being charged interest of the charging party's claim to interest on late payment. "Notice" shall be in writing, served by U.S. Certified Mail – Return Receipt Requested at the time the properly completed Application for Payment is received by the Owner or Owner's representative, and shall set forth the following:

- a) A short and concise statement that interest is due pursuant to the provisions of the Georgia Prompt Pay Act and this Prompt Payment Clause;
- b) The principal amount of the periodic or final payment which is allegedly due to the charging party; and
- c) The first day and date upon which the charging party alleges that said interest will begin to accrue, pursuant to the provisions of the Georgia Prompt Pay Act and this Prompt Payment Clause.

D. These "Notice" provisions are of the essence; therefore, failure to comply with any requirement as set forth in the Prompt Payment Clause precludes the right to interest on any alleged late payment to which said "Notice" would otherwise apply.

1. Integration with the Georgia Prompt Pay Act: Unless otherwise provided in these Contract Documents, the parties hereto agree that these provisions of this

Prompt Payment Clause supersede and control all provisions of the Georgia Prompt Pay Act (O.C.G.A. 13-11-1 through 13-11-11 (1994)), as originally enacted and as amended, and that any dispute arising between the parties hereto as to whether or not the provisions of this contract or the Georgia Prompt Pay Act control will be resolved in favor of these Contract Documents and its terms.

S.C.-14.02.D.1.c.

Delete paragraph 14.02.D.1.c. of the General Conditions in its entirety and insert the following in its place:

c. items entitling OWNER to retain set-offs from the amount recommended to cover accrued charges against CONTRACTOR for Liquid Damages or compensation to ENGINEER or other representatives of OWNER that are chargeable to CONTRACTOR in accordance with the Contract Documents.

S.C.-14.06.A.

14.06 Final Review of Construction

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

S.C.-14.07.C.

In paragraph 14.07.C. of the General Conditions, delete the phrase "Thirty days..." and replace it with "Forty-five days..."

S.C.-14.09.A.2.

Delete paragraph 14.09.A.2. of the General Conditions in its entirety and insert the following in its place:

2. A waiver of all claims by CONTRACTOR against OWNER.

S.C.-15.02.A.4.

Add the following new paragraphs immediately after paragraph 15.02.A.4. of the General Conditions, which is to read as follows:

5. The CONTRACTOR is adjudged bankrupt or insolvent;
6. The CONTRACTOR makes a general assignment for the benefit of creditors;
7. A trustee or receiver is appointed for the CONTRACTOR or for any of CONTRACTOR'S property;
8. The CONTRACTOR files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws;

9. The CONTRACTOR repeatedly fails to make prompt payments to Subcontractors or Material Suppliers for labor, materials or equipment;

S.C.-17.01.A.

Add the following new paragraph immediately after paragraph 17.01.A. in the General Conditions, which is to read as follows:

B. The CONTRACTOR shall file all "Notices of Commencement" required for this Project in accordance with O.C.G.A. §44-14-361.5 et.seq. and §36-82-104 et.seq., as applicable. The CONTRACTOR shall respond to all requests for copies of a Notice of Commencement. Should the OWNER or ENGINEER receive such a request, this request will be forwarded to the CONTRACTOR for further handling. The name and general description of the Project shall be as stated in the Invitation to Bid.

END OF SECTION

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NON-COLLUSION AFFIDAVIT OF BIDDER

STATE OF GEORGIA

COUNTY OF CHEROKEE

I, being first duly sworn, deposes and says that:

He or she is _____ of
(Owner, Partner, Officer, Representative or Agent)

_____, the Bidder that has submitted the attached Bid;

He or she is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

Such Bid is genuine and is not a collusive or sham Bid;

Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this Affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Canton, Georgia, or any person interested in the proposed Contract; and

The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this Affiant.

(Signed) _____

(Title) _____

Subscribed and Sworn before me this _____ day of _____, 20____

(Notary Public) *(signature)*

My Commission Expires: _____

(SEAL)

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O.C.G.A. § 50-36-1(e)(2) Affidavit

By executing this affidavit under oath, as an applicant for a City of Canton contract for public benefit as referenced in O.C.G.A § 50-36-1, I am stating the following with respect to my application for a City of Canton contract for public benefit:

- 1) _____ I am a United States citizen
- 2) _____ I am a legal permanent resident of the United States
- 3) _____ I am a qualified alien or non-immigrant under Federal Immigration and Nationality Act with an alien number issued by the Department of Homeland Security or other federal immigration agency.

My alien number issued by the Department of Homeland Security or other federal immigration agency is: _____

The undersigned applicant also hereby verifies that he or she is 18 years or older and has provided at least one secure and verifiable document, as required by O.C.G.A. § 50-36-1(e)(1), with this affidavit.

The secure and verifiable document provided with this affidavit can best be classified as:

_____.

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of O.C.G.A. § 16-10-20, and face criminal penalties as allowed by such criminal statute.

Executed in _____ (city), _____ (state).

Signature of Applicant

Date:

Printed Name of Applicant

Sworn to and subscribed before me

This _____ day of _____, 20____

Notary Public

My commission expires: _____

SECURITY AND IMMIGRATION COMPLIANCE ACT CERTIFICATION

Pursuant to the Georgia Security and Immigration Compliance Act of 2006, Contractor understands and agrees that compliance with the requirements of OCGA 13-10-91 and Georgia Department of Labor Rule 300-10-1 et. seq. are conditions of Agreement. Contractor further agrees that such compliance shall be attested through execution of Contractor Affidavit and Agreement required by Georgia Department of Labor Rule 300-10-1-.07, or a substantially similar contractor affidavit. Contractor’s fully executed affidavit is attached and is incorporated into this Agreement by reference herein.

By initialing in the appropriate line below, Contractor certifies that the following employee number category as identified in OCGA 13-10-91 is applicable to Contractor:

- 1. _____ 500 or more employees;
- 2. _____ 100 or more employees;
- 3. _____ Fewer than 100 employees.

Contractor understands and agrees that, in the event Contractor employs or contracts with Subcontractor in connection with this Agreement, Contractor shall:

- 1. Secure from each Subcontractor an indication of the employee-number category as identified in OCGA 13-10-91; and
- 2. Secure from each Subcontractor an attestation of Subcontractor’s compliance with OCGA 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02 by causing each Subcontractor to execute the attached Subcontractor Affidavit required by Georgia Department of Labor Rule 300-10-1-.08, or a substantially similar subcontractor affidavit. Contractor further understands and agrees that Contractor shall require the executed Subcontractor Affidavit to become a part of the agreement between Contractor and each Subcontractor. Contractor agrees to maintain records of each Subcontractor attestation required hereunder for inspection by Owner.

BY: Authorized Officer or Agent

Date

Title of Authorized Officer or Agent if Contractor

Printed Name of Authorized Officer or Agent

Subscribed and Sworn Before Me on this
_____ day of _____, 20_____

Notary Public
My Commission Expires:

Contractor Affidavit Under O.C.G.A. § 13-10-91(b)(1)

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm, or corporation which is engaged in the physical performance of services on behalf of the City of Canton has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicability provisions and deadlines in O.C.G.A. § 13-10-91.

Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification No.: _____

Date of Authorization: _____

Name of Contractor: Lanier Contracting Co.

Name of Project: Amos Road Booster Pump Station Improvements Project

Name of Public Employer: City of Canton, Georgia

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, _____, 20__ in _____ (city), _____ (state)

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

Sworn to and subscribed before me

This _____ day of _____, 20__

Notary Public

My commission expires: _____

Subcontractor Affidavit Under O.C.G.A. § 13-10-91(b)(3)

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm, or corporation which is engaged in the physical performance of services under contract with Lanier Contracting Co. on behalf of the City of Canton has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicability provisions and deadlines in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five business days of receipt, a copy of the notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification No.: _____

Date of Authorization: _____

Name of Subcontractor: _____

Name of Project: Amos Road Booster Pump Station Improvements Project

Name of Public Employer: City of Canton, Georgia

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ____, 20__ in _____ (city), _____ (state)

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

Sworn to and subscribed before me

This ____ day of _____, 20__

Notary Public

My commission expires: _____

SECTION 01010

SUMMARY OF WORK

PART 1: GENERAL

1.01 DESCRIPTION

- A. The work of this Contract is in Canton, Georgia at the existing City of Canton Water Pollution Control Plant (WPCP). The City of Canton WPCP is located at 1078 Marietta Highway, Canton, Georgia 30114.
- B. It is the responsibility of each bidder to field verify the work, location, and related conditions. Opportunity for verification can be arranged through the City of Canton.
- C. Any borings or test results are provided for the Contractors convenience only. There are no warranties or representations made to their accuracy. The Contractor may verify such results at his own expense.
- D. The work to be undertaken under this contract includes, but is not limited to, the following items:
 - 1. A new administration building
 - 2. Modifications to the headworks and grit systems
 - 3. New fine screening facility
 - 4. New and modified treatment trains
 - 5. Addition of a new Membrane Bioreactor (MBR) Facility
 - 6. New Ultraviolet Disinfection and post-aeration structure
 - 7. New odor control facilities
 - 8. New solids handling facilities
 - 9. Modifications to existing buildings and structures
 - 10. Upgrades and additions to existing electrical and control systems
- E. The work shall be performed under a single prime contract.
- F. Milestone dates are based on the Notice to Proceed date.

1.02 CONTRACTOR'S USE OF PREMISES

- A. Contractor shall have complete use of the premises for the performance of the Work.
- B. Coordinate use of premises with Engineer and Owner. Normal construction hours shall be Monday through Friday, 7:00 a.m. to 7:00 p.m., excluding holidays observed by the City of Canton. The contractor must coordinate with the Owner if he wishes to work beyond these hours.

- C. A portion of the existing parking area and an area inside the fence will be made available for Contractor mobilization and lay-down area. Contractor shall keep driveways and entrances clear and clean. Schedule deliveries to minimize on-site storage of materials and equipment.
- D. Contractor shall assume full responsibility for security of all his and his subcontractor's materials and equipment stored on the site.
- E. If directed by the Owner or Engineer, move any stored items that interfere with ongoing operations of other contractors.
- F. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

1.03 SITE PROTECTION AND SECURITY

- A. The Contractor shall furnish and erect such barricades, fences, lights, and danger signals and shall provide such other precautionary measures for the protection of persons or property and of the work as necessary. Barricades shall be painted in a color that will be visible at night. From sunset to sunrise, the Contractor shall furnish and maintain at least one light at each barricade and sufficient numbers of barricades shall be erected to keep vehicles from being driven on or into any work under construction.
- B. The Contractor shall be held responsible for all damage to the work due to failure of barricades, signs, and lights to protect it and whenever evidence is found of such damage, the Contractor shall immediately remove the damaged portion and replace it at his cost and expense. The Contractor's responsibility for the maintenance of barricades, signs, and lights shall not cease until the project has been accepted by the Owner.
- C. Contractor shall provide any additional security such as security cameras and/or guards as required to maintain the security of stored material and Contractor property at no cost to the Owner.

1.04 CONTINUITY OF PLANT OPERATIONS

- A. The existing facility is currently and continuously receiving and treating wastewater. These functions shall not be impeded or interrupted during this contract except as specified herein.
- B. All work must be coordinated with the Owner and Engineer to avoid interference with the operation of plant equipment and processes.
 - 1. The Contractor and/or his subcontractors, suppliers, and/or vendors shall not operate any valves, gates, energize or de-energize any existing equipment without written notice to the Owner. The Owner or the Owner's Representative shall be present to provide this service or to witness the operation.
- C. Unscheduled bypassing of untreated or partially treated sewage to surface waters or drainage courses is prohibited during construction. In the event of accidental bypassing by the Contractor's operations, the Owner shall be entitled to immediately employ such means and methods the Owner deems necessary to stop the bypassing without giving the Contractor any written notice.

- D. Penalties imposed on the Owner as a result of any bypass caused by the Contractor shall be borne in full by the Contractor, including legal fees and other expenses resulting directly or indirectly from the bypass.
- E. The Contractor shall submit a detailed plan and time schedule for plant shut downs. The plan shall fully describe the means and methods for preventing the unplanned bypassing of treatment units, the length of time required to complete the planned operation, and the necessary equipment required.
- F. The Owner and Engineer shall be notified in advance of any planned operation that requires a shut down, or intentional bypass operations. Refer to Section 01520 Maintenance of Plant Operations.
- G. Shut downs or planned bypass operations, when approved, shall be performed during seasonal and daily low flow periods.

1.05 CONSTRAINTS

- A. The Contractor is advised that the existing treatment facility must remain in service during construction of this project.

1.06 MILESTONES

- A. Milestones and completion dates are addressed in Section 01015 Sequence of Work.

1.07 PERMITS AND LICENSE FEES

- A. Obtain and pay for all necessary licenses and permits, and comply with any applicable federal, state, and municipal laws, codes and regulations, in connection with the execution of the Work. Contractor shall use proper safety and health precautions to protect the Work, the workers, the public and the property of others.

1.08 APPLICABLE CODES AND STANDARDS

- A. All materials, equipment, fabrication, and installation practices shall comply with the following applicable codes and standards, except in those cases where the Contractor's quality standards establish more stringent quality requirements, as determined by the Engineer.
 - 1. Pressure Piping and Tubing
 - a. ANSI (American National Standards Institute)
 - b. API (American Petroleum Institute)
 - c. ASME (American Society of Mechanical Engineers)
 - d. AWWA (American Water Works Association)
 - e. NSF (National Sanitation Foundation)
 - 2. Materials
 - a. ASSHTO (American Association of State Highway and Transportation Officials)
 - b. ANSI (American National Standards Institute)

- c. ASTM (American Society for Testing and Materials)
3. Painting and Surface Preparation
 - a. NACE (National Association of Corrosion Engineers)
 - b. SSPC (Steel Structures Painting Council)
4. Gear Reducers and Bearings
 - a. AFBMA (Anti-friction Bearing Manufacturers Association)
 - b. AGMA (American Gear Manufacturers Association)
5. Ventilating Fans
 - a. AMCA (Air Moving and Conditioning Association)
 - b. PFMA (Power Fan Manufacturers Association)
6. Electrical and Instrumentation
 - a. EIA (Electronic Industries Association)
 - b. IEEE (Institute of Electrical and Electronic Engineers)
 - c. IPC (Institute of Printed Circuits)
 - d. IPCEA (Insulated Power Cable Engineers Association)
 - e. ISA (Instrument Society of America)
 - f. NEMA (National Electrical Manufacturers Association)
 - g. NFPA (National Fire Protection Association)
 - h. UL (Underwriter's Laboratories)
7. Aluminum
 - a. AA (Aluminum Association)
 - b. AAMA (Architectural Aluminum Manufacturers Association)
8. Steel
 - a. AISC (American Institute of Steel Construction)
9. Concrete (Cast & Precast)
 - a. ACI (American Concrete Institute)
 - b. PLA (Portland Cement Association)
 - c. PCI (Precast Concrete Institute)
10. Welding
 - a. ASME (American Society of Mechanical Engineers)
 - b. AWS (American Welding Society)
11. Safety
 - a. OSHA (Occupational Safety and Health Act)
12. General Building Construction

- a. FM (Factory Mutual Fire Insurance Company)
 - b. NFPA (National Fire Protection Association)
 - c. IBC (International Building Code)
13. Subgrades and Pavement
- a. SSRBC (Standard Specifications for Road and Bridge Construction, Georgia Department of Transportation)
14. Ductwork and Sheet Metal Work
- a. SMACNA (Sheet Metal and Air Conditioning Contractors National Association)
15. Plumbing
- a. AGA (American Gas Association)
 - b. NSF (National Sanitation Foundation)
 - c. PDI (Plumbing Drainage Institute)
 - d. SPC (SBCC Standard Plumbing Code)
16. Refrigeration, Heating, and Air Conditioning
- a. ARI (American Refrigeration Institute)
 - b. ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers)
17. Pressure Vessels
- a. ASME (American Society of Mechanical Engineers)
- B. In addition, all work shall comply with the applicable requirements of local codes, utilities, and other authorities having jurisdiction.
- C. All material and equipment, for which a UL Standard, an AGA approval, or an ASME requirement is established, shall be so approved and labeled or stamped. Label or stamp shall be conspicuous and not covered, painted, or otherwise obscured from visual inspection.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

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SECTION 01015

SEQUENCE OF WORK

PART 1: GENERAL

1.01 DESCRIPTION

- A. This Section including the attached Supplement provides details of a suggested sequence of work.
- B. The Contractor shall submit the sequence and schedule for the work in accordance with Section 01311 Construction Schedules and Meetings and Section 01300 Submittals.
- C. Milestone dates provided in the Contract Documents are based on a Notice to Proceed.

1.02 RELATED SECTIONS

- A. Section 01010 Summary of Work.
- B. Section 01311 Construction Schedule.
- C. Section 01520 Maintenance of Plant Operations.

1.03 CONSTRAINTS

- A. The existing Canton WPCP facility is currently and continuously receiving and treating wastewater. These functions cannot be impeded or interrupted during this contract except as specified herein. Any request to interrupt the standard operation of this plant must be approved by the Owner.
- B. The Contractor is advised that the Canton WPCP is located adjacent to a public school with a shared access road.
- C. Normal construction hours will be limited to Monday through Friday, 7:00 a.m. to 7:00 p.m., Overtime work must be approved by the Owner.
- D. All work must be coordinated with the Owner and Engineer.

1.04 SEQUENCE OF WORK

- A. Attached as a Supplement to this Section is the Engineer's Proposed Construction Phasing Plan. Use of this plan does not relieve the Contractor of the requirement of maintaining operations during construction.
- B. Operations of the existing wastewater treatment and sludge management processes must be maintained during construction of the new facilities. The proposed 5-phase construction phasing plan listed in the attachment is the Engineer's suggested schedule for meeting this objective. Use of this construction sequence does not relieve the Contractor of the requirement of maintaining operations during construction.
- C. The 5-phase construction plan outlined in the attached Supplement is not inclusive of all construction activities required to complete construction of this

project and does not relieve the Contractor of providing any and all ancillary systems.

- D. The Contractor shall ensure that the decommissioning of existing facilities does not occur until the new replacement facilities have passed functional testing and meet local and state government requirements, including all occupancy and regulatory permit conditions.
- E. Temporary utilities have not been fully addressed in the attached Supplement. The Contractor shall ensure that all temporary utility needs are addressed in their detailed construction schedule.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

SUPPLEMENT: Proposed Construction Phasing Plan

END OF SECTION

Canton WPCP Expansion Proposed Construction Phasing Plan

General

Operation of the existing wastewater treatment and sludge management processes must be maintained during construction of the new facilities. The proposed 5-phase construction phasing plan listed below is the Engineer's suggested plan for meeting this objective. Use of this construction sequence does not relieve the Contractor of the requirement of maintaining the plant operations during construction.

The 5-phase construction plan outlined below is not inclusive of all construction activities required to complete construction of this project and does not relieve the Contractor of providing any and all ancillary systems.

Contractor shall ensure that the decommissioning of existing facilities does not occur until the new replacement facilities have passed functional testing and meet local and state government requirements, including all occupancy and regulatory permit conditions.

Temporary utilities have not been fully addressed in this construction sequence. Contractor shall ensure that all temporary utility needs are addressed in their detailed construction schedule.

Phase 1

The purpose of Phase 1 is to augment the plant's wastewater treatment capacity through the installation of new treatment facilities, thus allowing for phased conversion of the existing treatment facilities. The existing treatment processes will remain in operation throughout the construction of this initial phase. Phase 1 includes the activities listed below.

- Construction of new Facilities/Processes
 - Odor Control Facility - Headworks
 - Screenings Facility
 - BNR Blowers
 - BNR Basins 1, 2, and 3
 - RAS Splitter Box
 - MBR Facility
 - Scum Pumping System
 - BNR/MBR Electrical Building
 - Ultraviolet Disinfection and Post Aeration (UVPA) Facility
 - Magnesium Hydroxide Equipment Pad (for Owner leased equipment)
 - Alum Feed Facility
 - Compressed Air Mixing System
 - Administration and Control Building
 - Electrical Transformer Pads
 - Electrical Switchgear – Main
 - Electrical Switchgear - OC

- Installation of new yard piping
 - Odorous air ductwork at the Headworks
 - Plant potable water distribution system
 - From existing SBR Splitter Box to the Fine Screens
 - From the Fine Screens to the BNR Influent Channel
 - Miscellaneous drain piping to existing sanitary sewer
 - All internal piping associated with BNR Basins 1, 2, and 3
 - All piping from the BNR Blowers and the RAS Splitter Box to BNR Basins 1, 2, 3, and 4. Provide temporary cap for RAS and air piping for connection to BNR Basin 4 in Phase 2.
 - Permeate Piping from the MBR Facility to the new UVPA Facility
 - Overflow Piping from the MBR Facility to the existing EQ Overflow Box (temporary and permanent)
 - Provide stub out and temporary cap on reuse pipe from new UVPA to proposed reuse pump station for connection in Phase 2.
 - Effluent piping from the new UVPA Facility to the existing cascade aerator
 - New chemical piping from the Alum Feed Facility to the BNR Basins 1, 2, and 3
 - New chemical piping from new Magnesium Hydroxide Facility to the Fine Screenings Facility
 - Compressed air piping to BNR Basins 1, 2, and 3.
 - Potable water piping to the new facilities
 - Sanitary sewer from new Administration Building
- Improvements to the Headworks Facility
- Modifications to existing SBR Splitter Box
- Improvements to the existing grit system at Headworks
- Relocation of gravity sewer line and manhole on the northwest side between the existing Dewatering Facility and existing Plant Drain Pump Station No. 1
- Installation of WAS piping from the MBR Facility to the existing aerobic digester (temporary and permanent)
- Installation of Scum piping from the Scum Pumping System to the existing aerobic digester (temporary and permanent)
- Installation of new utility power supplies
- Coordination of electrical service with Georgia Power
- Installation of new PLC at Headworks
- Modifications to existing redundant power system and electrical control centers
- Installation of NEW electrical duct banks and power supplies to new and existing facilities
- Installation and calibration of all control panels and Plant SCADA System for new and modified facilities
- Installation of new retaining walls

Phase 1 will be considered complete when, at a minimum, the conditions listed below are met.

- New wastewater treatment processes provide firm capacity of 4.5 mgd.
- All new facilities are certified as Substantially Complete
- Performance testing has been completed for the SCADA updates associated with new and modified facilities and Headworks
- Certificate of Occupancy for new Administration and Control Building has been received
- Redundant power to new facilities has been verified

Estimate of construction duration for Phase 1 is 18 – 24 months.

Phase 2

At the completion of Phase 1, the plant treatment capacity of 4.5 mgd can be met through the use of the new BNR Basins 1, 2, and 3 and MBR Facilities. This will allow for the conversion of the existing SBR Basins to new processes during Phase 2. Phase 2 includes the activities listed below.

- Conversion of SBR 4 to BNR Basin 4
- Conversion of SBR 2 & 3 to Aerobic Digesters
- Conversion of SBR 1 to WAS Holding Tank
- Conversion of Equalization Basin to Reuse Water Wetwell and Pump Station
- Installation of new Sludge Feed Pumps in the WAS Holding Tank
- Construction of new Facilities/Processes
 - New Aerobic Digester Blower Pad (Blowers installed in Phase 4)
 - Rotary Drum Thickener Pad at new Aerobic Digesters (Rotary Drum Thickeners installed in Phase 4)
- Demolition of existing facilities
 - Existing magnesium hydroxide pad and piping pending removal of leased equipment
 - Dynasand filters and associated polyaluminum chloride system
 - Portions of the UVPA Facility (cascade aerator to remain)
 - Chlorine contact and reuse pump station attached to SBR 2
 - Reuse water meter and valve vaults
 - Existing Reuse Pumps, Alum Tank and Alum Pumps at the existing Chemical Building
- Installation of new yard piping
 - Influent piping to BNR Basin 4
 - Effluent channel from BNR Basin 4 to BNR Basins 1 – 3 effluent channel
 - RAS and air piping from pipe rack at BNR Basins 1, 2, and 3 to BNR Basin 4
 - Chemical piping to BNR Basin 4
 - All internal piping associated with BNR Basin 4
 - Compressed air piping to BNR Basin 4

- Permanent WAS piping from MBR to new WAS Holding Tank
 - Permanent scum piping from Scum Pumping System to new WAS Holding Tank
 - Reuse pipe from UVPA Facility to Reuse Wetwell
 - Reuse Pump Station piping and meter box
 - TWAS piping leaving Aerobic Digesters 1 and 2 (temporarily cap for future connection)
 - WAS bypass piping to Aerobic Digesters 1 and 2
 - Compressed air to Aerobic Digesters 1 and 2
 - Reroute of drain from existing Chemical Building to new sanitary sewer manhole
- Installation of temporary yard piping for WAS from the new Sludge Feed Pumps in the WAS Storage Tank to the existing sludge vault
 - Installation of new electrical duct banks and power supplies to new facilities
 - Installation and calibration of all control panels and Plant SCADA System at new and modified facilities
 - Temporary controls for the new WAS pumps to the existing sludge vault. (Note that Phase 3 can begin once this step is complete.)

Phase 2 will be considered complete when, at a minimum, the conditions listed below are met.

- BNR and MBR treatment processes provide firm capacity of 6 mgd
- Performance testing of compressed air mixing system in Aerobic Digesters 1 and 2 is complete
- Operational readiness testing has been completed for the SCADA updates associated with the aeration and mixing systems at the new Aerobic Digesters
- The Reuse Pump Station is certified as Substantially Complete
- All new liquid treatment facilities are certified as Substantially Complete
- Performance testing has been completed for the SCADA updates associated with new facilities
- Redundant power to modified facilities has been verified

The Aerobic Digesters cannot be placed into service in Phase 2. The rotary drum thickeners and digester blowers will be installed in Phase 4 to coincide with the installation of the RDT polymer system. This system will be located in the new Solids Handling Facility which cannot be constructed until Phase 4.

Estimate of construction duration for Phase 2 is 9-12 months.

Phase 3

At the completion of Phase 2, wastewater treatment is fully converted to the BNR and MBR Facilities and the liquid treatment processes are complete. Phase 3 begins the demolition required to begin construction of the Solids Handling Facility. Note that Phase 3 can begin once the WAS Holding Tank and WAS Pumps are in service and temporary piping and controls from the WAS Pumps to the existing sludge storage vault is operational.

- Demolition of existing facilities

- Aerobic Digester
- Control Building and Air Compressor Shed including existing MCC-1

Estimate of construction duration for Phase 3 is 3-6 months.

Phase 4

The demolition of the existing Aerobic Digester in Phase 3 provides space for the new Solids Handling Facility to be constructed in Phase 4. Phase 4 includes the activities listed below.

- Construction of new Facilities/Processes
 - Solids Handling Facility, including dewatering equipment, drain pump station, and sludge dryer
 - Odor Control Facility – Solids Handling Facility
- Installation of Rotary Drum Thickeners at the Aerobic Digesters
- Installation of Digester Blowers at the Aerobic Digesters
- Installation of new yard piping
 - Sludge feed piping from WAS Holding Tank to the Rotary Drum Thickeners
 - Air piping at Aerobic Digesters 1 and 2
 - Drain line from the rotary drum thickeners to the Dewatering Drain Pump Station
 - Odorous air ductwork to the Odor Control Facility
 - Drain piping from Dewatering Drain Pump Station to Headworks
- Installation of new electrical duct banks and power supplies to new facilities
- Installation and calibration of all control panels and Plant SCADA System at new facilities

Phase 4 will be considered complete when, at a minimum, the conditions listed below are met.

- All new solids handling and odor control facilities are certified as Substantially Complete
- Performance testing of diffusers in Aerobic Digesters 1 and 2 is complete
- Performance testing of rotary drum thickeners at Aerobic Digesters 1 and 2 is complete
- Performance testing has been completed for the SCADA updates associated with new facilities
- Redundant power to new facilities has been verified

Estimate of construction duration for Phase 4 is 12 -15 months.

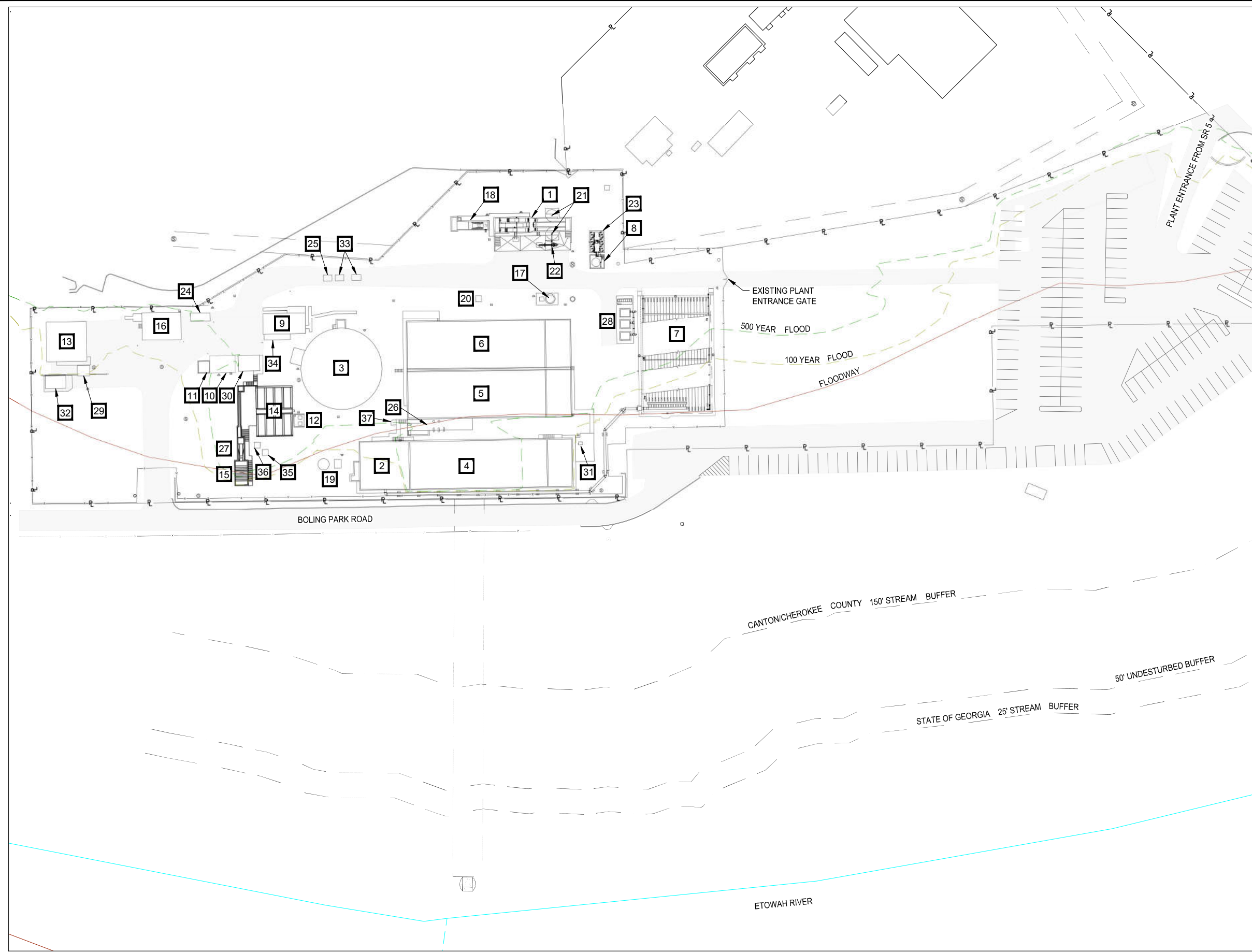
Phase 5

Phase 4 completes the construction of the new sludge management processes. Phase 5 concludes the construction activities associated with this Project. These activities include, but are not limited to, the following items.

- Demolition of the existing equipment and support pads in the existing Sludge Press Building. (Coordinate with Owner.)
- Removal of all temporary utilities, such as WAS piping to old sludge vault

- Final completion of all facilities and processes
- Final completion of all site civil and electrical work
- Final completion of functional and performance testing of SCADA and instrumentation controls

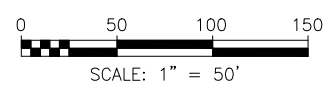
Estimate of construction duration for Phase 5 is 3-6 months.



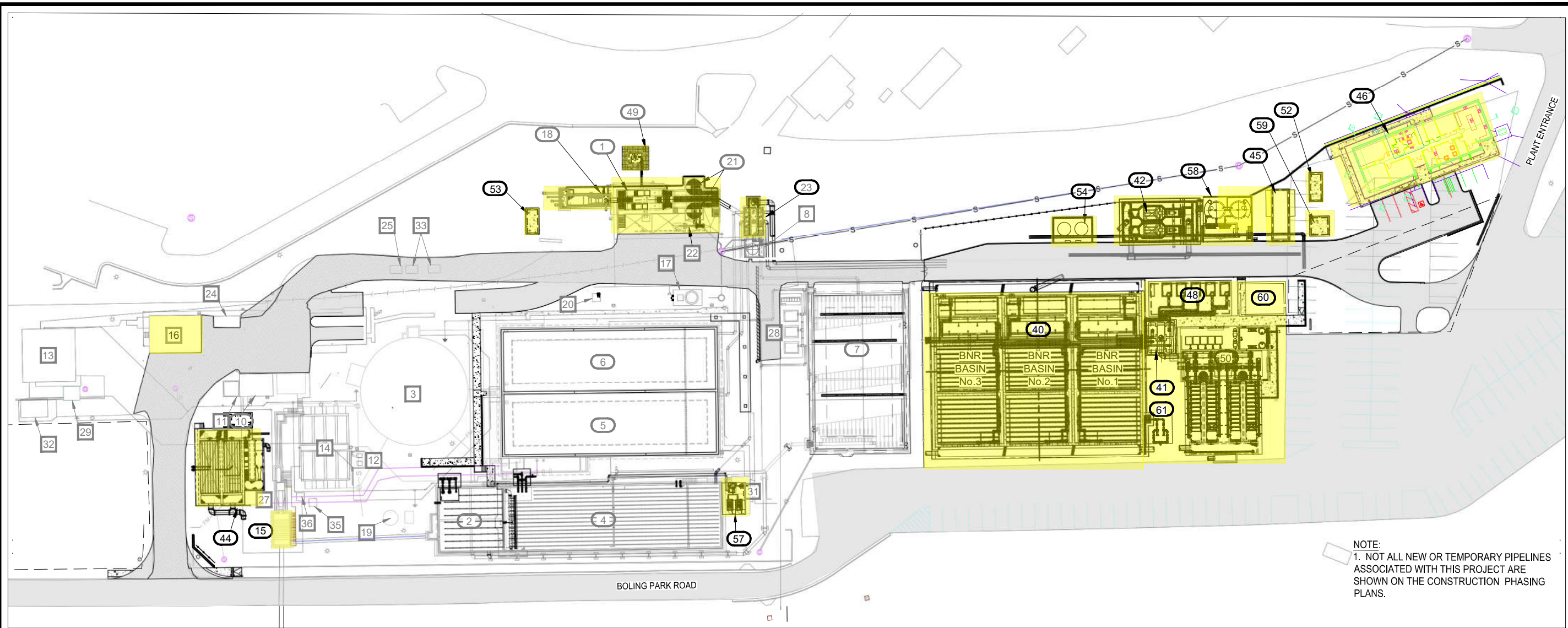
- LEGEND:**
(EXISTING STRUCTURES/EQUIPMENT)
- 1 HEADWORKS
 - 2 EQUALIZATION BASIN
 - 3 DIGESTER
 - 4 SBR No.1
 - 5 SBR No.2
 - 6 SBR No.3
 - 7 SBR No.4
 - 8 MAGNESIUM HYDROXIDE SYSTEM
 - 9 CONTROL BUILDING
 - 10 CHEMICAL BUILDING
 - 11 SODIUM HYPOCHLORITE SYSTEM
 - 12 POLYALUMINUM CHLORIDE SYSTEM
 - 13 SLUDGE PRESS BUILDING
 - 14 DYNASAND FILTER
 - 15 CASCADE AERATOR
 - 16 OFFICE/ADMINISTRATION BUILDING
 - 17 INFLUENT PUMP STATION
 - 18 INFLUENT METERING FLUME
 - 19 PLANT DRAIN PUMP STATION PS-1
 - 20 FLOW METER VAULT
 - 21 GRIT CHAMBERS
 - 22 GRIT CLASSIFIER
 - 23 SBR SPLITTER BOX
 - 24 EMERGENCY GENERATOR
 - 25 WATER METER
 - 26 REUSE PUMP STATION
 - 27 UV SYSTEM AND FLUME
 - 28 SBR No.4 BLOWERS
 - 29 SLUDGE VAULT
 - 30 ALUM TANK No.1
 - 31 SBR No.1 BLOWERS
 - 32 SLUDGE LOADING STATION
 - 33 BACKFLOW PREVENTER
 - 34 AIR COMPRESSOR SHED
 - 35 REUSE WATER METER VAULT
 - 36 REUSE VALVE VAULT
 - 37 EXISTING MANHOLE

- EXISTING SITE/SYMBOLS LEGEND**
- ⊕ ACCESS HATCH
 - ⊙ STORM DRAIN MANHOLE
 - ⊙ SANITARY MANHOLE
 - ⊙ ELECTRICAL
 - ⊙ CATCH BASIN
 - ⊙ PIPE RISER
 - ⊙ YARD INLET
 - ⊙ DROP INLET
 - ⊙ CLEANOUT
 - ⊙ ELECTRIC BOX/CONTROL BOX
 - ⊙ ELECTRIC METER
 - ⊙ SIGN
 - ⊙ POWER POLE
 - ⊙ LIGHT POLE
 - ⊙ WATER VALVE
 - ⊙ SPIGOT
 - ⊙ BURIED ELECTRICAL
 - ⊙ TEMPORARY SURVEY CONTROL POINT

EXISTING OVERALL SITE PLAN
SCALE: 1"=50'



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DATE		REVISION	
PROJ. NO.: 100061831	DESIGNED BY: DLG	CHECKED BY: ---	APPROVED BY: ---
DRAWN BY: JN	DATE: JUNE 2020	SCALE: AS SHOWN	SCALE: AS SHOWN
CITY OF CANTON, GEORGIA WATER POLLUTION CONTROL PLANT EXPANSION TO 6 MGD			
EXISTING OVERALL SITE PLAN			
SHEET NO.			
C-2			



NOTE:
1. NOT ALL NEW OR TEMPORARY PIPELINES ASSOCIATED WITH THIS PROJECT ARE SHOWN ON THE CONSTRUCTION PHASING PLANS.

CONSTRUCTION PHASING SITE PLAN- PHASE 1
SCALE: 1"=40'



LEGEND:
EXISTING STRUCTURES/EQUIPMENT

- 1 HEADWORKS
- 2 EQUALIZATION BASIN
- 3 DIGESTER
- 4 SBR No.1
- 5 SBR No.2
- 6 SBR No.3
- 7 SBR No.4
- 8 MAGNESIUM HYDROXIDE SYSTEM
- 9 CONTROL BUILDING
- 10 CHEMICAL BUILDING
- 11 SODIUM HYPOCHLORITE SYSTEM
- 12 POLYALUMINUM CHLORIDE SYSTEM

LEGEND:
EXISTING STRUCTURES/EQUIPMENT (CONTINUED)

- 13 SLUDGE PRESS BUILDING
- 14 DYNASAND FILTER
- 15 CASCADE AERATOR
- 16 OFFICE/ADMINISTRATION BUILDING
- 17 INFLUENT PUMP STATION
- 18 INFLUENT METERING FLUME
- 19 PLANT DRAIN PUMP STATION PS-1
- 20 FLOW METER VAULT
- 21 GRIT CHAMBERS
- 22 GRIT CLASSIFIER
- 23 SBR SPLITTER BOX
- 24 EMERGENCY GENERATOR

LEGEND:
EXISTING STRUCTURES/EQUIPMENT (CONTINUED)

- 25 WATER METER
- 26 REUSE PUMP STATION
- 27 UV SYSTEM AND PARSHALL FLUME
- 28 SBR No.4 BLOWERS
- 29 SLUDGE VAULT
- 30 ALUM TANK
- 31 POST EQUALIZATION BASIN BLOWERS
- 32 SLUDGE LOADING STATION
- 33 BACKFLOW PREVENTER
- 34 AIR COMPRESSOR SHED
- 35 REUSE WATER METER VAULT
- 36 REUSE VALVE VAULT

LEGEND:
(MODIFIED/REPURPOSED STRUCTURES/EQUIPMENT)

- 1 HEADWORKS
- 2 REUSE WATER WETWELL (FORMER POST EQUALIZATION BASIN)
- 4 WAS STORAGE (FORMER SBR No.1)
- 5 AEROBIC DIGESTER (FORMER SBR No. 2)
- 6 AEROBIC DIGESTER (FORMER SBR No. 3)
- 7 BNR BASIN No. 4 (FORMER SBR No. 4)
- 10 CHEMICAL BUILDING MODIFICATIONS
- 15 CASCADE AERATOR
- 18 INFLUENT FLUME MODIFICATIONS
- 19 PLANT DRAIN PUMP STATION PS-1 MODIFICATIONS
- 21 GRIT CHAMBER MODIFICATIONS
- 23 SBR SPLITTER BOX MODIFICATIONS

LEGEND:
(PROPOSED STRUCTURES/EQUIPMENT)

- 40 BNR BASINS No.1, No.2, No.3
- 41 RAS SPLITTER BOX
- 42 FINE SCREENINGS FACILITY
- 43 THICKENING / DEWATERING BUILDING
- 44 UVPA FACILITY (UV AND POST AERATION)
- 45 EMERGENCY GENERATOR
- 46 ADMINISTRATION / CONTROL BUILDING
- 47 UVPA AERATION BLOWERS
- 48 AERATION BASIN BLOWERS
- 49 ODOR CONTROL FACILITY
- 50 MEMBRANE FACILITY
- 51 NOT USED
- 52 ELECTRICAL SWITCHGEAR-MAIN

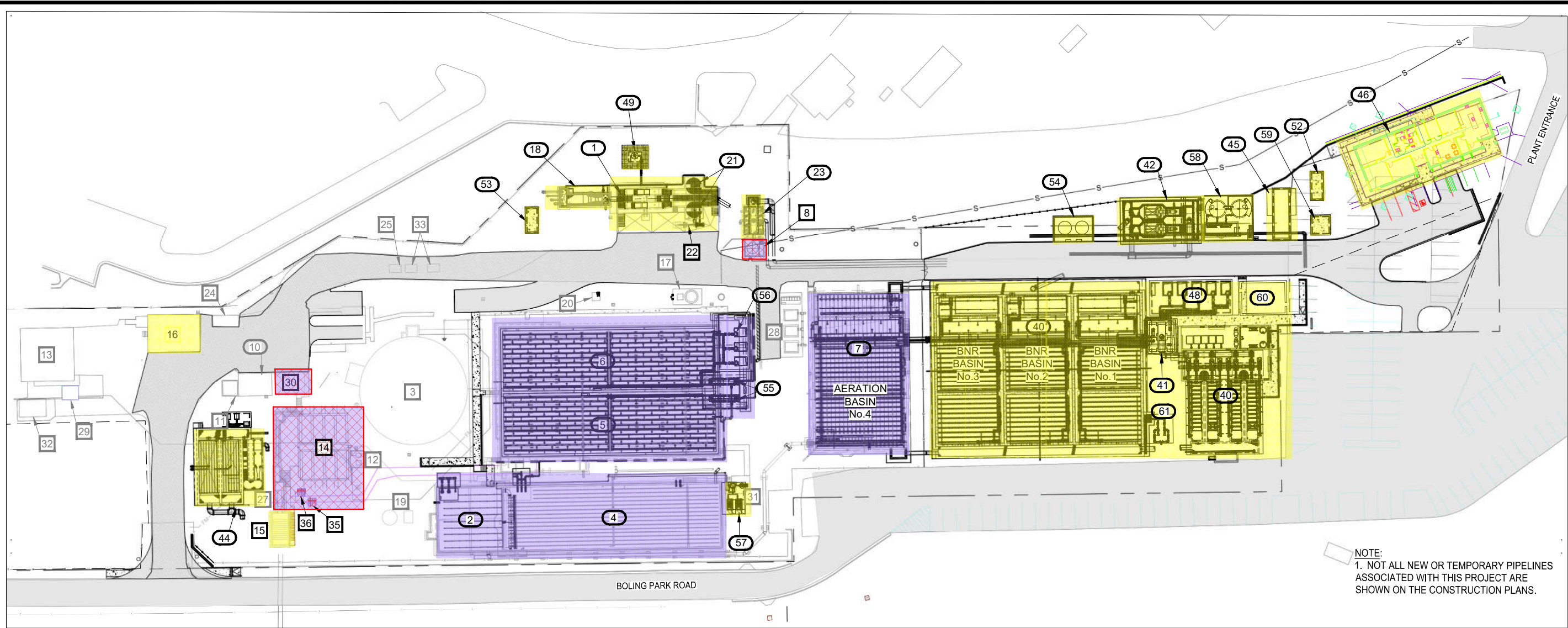
CONTINUED
(PROPOSED STRUCTURES/EQUIPMENT - CONTINUED)

- 53 ELECTRICAL SWITCHGEAR-OC
- 54 MAGNESIUM HYDROXIDE SYSTEM
- 55 ROTARY DRUM THICKENER
- 56 AEROBIC DIGESTER BLOWERS
- 57 COMPRESSED AIR MIXING SYSTEM
- 58 ALUM FEED FACILITY
- 59 ELECTRICAL TRANSFORMER PAD
- 60 BNR / MBR ELECTRICAL BUILDING
- 61 SCUM PUMPING SYSTEM

PHASING PLAN LEGEND:

- PHASE 1
- NEW PIPING
- TEMPORARY PIPING
- DEMOLISH

 1600 RiverEdge Parkway, NW, Suite 700 Atlanta, GA 30328 P: 770-953-0280		 196 LOG CHASE, CIRCLE SUITE 200 ATLANTA, GA 30328 (404) 248-3111	
PROJ. NO. : 100061831	DATE	REVISION	DATE
DESIGNED BY:			
DRAWN BY:			
CHECKED BY:			
APPROVED BY:			
DATE: SEPTEMBER 2020			
SCALE:			
CITY OF CANTON, GEORGIA WATER POLLUTION CONTROL PLANT EXPANSION TO 6 MGD CONSTRUCTION PHASING SITE PLAN PHASE 1			
SHEET NO.			
FIG 2			



NOTE:
1. NOT ALL NEW OR TEMPORARY PIPELINES ASSOCIATED WITH THIS PROJECT ARE SHOWN ON THE CONSTRUCTION PLANS.

CONSTRUCTION PHASING SITE PLAN- PHASE 2
SCALE: 1"=40'



- LEGEND:**
EXISTING STRUCTURES/EQUIPMENT
- 1 HEADWORKS
 - 2 EQUALIZATION BASIN
 - 3 DIGESTER
 - 4 SBR No.1
 - 5 SBR No.2
 - 6 SBR No.3
 - 7 SBR No.4
 - 8 MAGNESIUM HYDROXIDE SYSTEM
 - 9 CONTROL BUILDING
 - 10 CHEMICAL BUILDING
 - 11 SODIUM HYPOCHLORITE SYSTEM
 - 12 POLYALUMINUM CHLORIDE SYSTEM

- LEGEND:**
EXISTING STRUCTURES/EQUIPMENT (CONTINUED)
- 13 SLUDGE PRESS BUILDING
 - 14 DYNASAND FILTER
 - 15 CASCADE AERATOR
 - 16 OFFICE/ADMINISTRATION BUILDING
 - 17 INFLUENT PUMP STATION
 - 18 INFLUENT METERING FLUME
 - 19 PLANT DRAIN PUMP STATION PS-1
 - 20 FLOW METER VAULT
 - 21 GRIT CHAMBERS
 - 22 GRIT CLASSIFIER
 - 23 SBR SPLITTER BOX
 - 24 EMERGENCY GENERATOR

- LEGEND:**
EXISTING STRUCTURES/EQUIPMENT (CONTINUED)
- 25 WATER METER
 - 26 REUSE PUMP STATION
 - 27 UV SYSTEM AND PARSHALL FLUME
 - 28 SBR No.4 BLOWERS
 - 29 SLUDGE VAULT
 - 30 ALUM TANK
 - 31 POST EQUALIZATION BASIN BLOWERS
 - 32 SLUDGE LOADING STATION
 - 33 BACKFLOW PREVENTER
 - 34 AIR COMPRESSOR SHED
 - 35 REUSE WATER METER VAULT
 - 36 REUSE VALVE VAULT

- LEGEND:**
(MODIFIED/REPURPOSED STRUCTURES/EQUIPMENT)
- 1 HEADWORKS
 - 2 REUSE WATER WETWELL (FORMER POST EQUALIZATION BASIN)
 - 4 WAS STORAGE (FORMER SBR No.1)
 - 5 AEROBIC DIGESTER (FORMER SBR No. 2)
 - 6 AEROBIC DIGESTER (FORMER SBR No. 3)
 - 7 BNR BASIN No. 4 (FORMER SBR No. 4)
 - 10 CHEMICAL BUILDING MODIFICATIONS
 - 15 CASCADE AERATOR
 - 18 INFLUENT FLUME MODIFICATIONS
 - 19 PLANT DRAIN PUMP STATION PS-1 MODIFICATIONS
 - 21 GRIT CHAMBER MODIFICATIONS
 - 23 SBR SPLITTER BOX MODIFICATIONS

- LEGEND:**
(PROPOSED STRUCTURES/EQUIPMENT)
- 40 BNR BASINS No.1, No.2, No.3
 - 41 RAS SPLITTER BOX
 - 42 FINE SCREENINGS FACILITY
 - 43 THICKENING / DEWATERING BUILDING
 - 44 UVPA FACILITY (UV AND POST AERATION)
 - 45 EMERGENCY GENERATOR
 - 46 ADMINISTRATION / CONTROL BUILDING
 - 47 UVPA AERATION BLOWERS
 - 48 AERATION BASIN BLOWERS
 - 49 ODOR CONTROL FACILITY
 - 50 MEMBRANE FACILITY
 - 51 NOT USED
 - 52 ELECTRICAL SWITCHGEAR-MAIN

- CONTINUED**
(PROPOSED STRUCTURES/EQUIPMENT - CONTINUED)
- 53 ELECTRICAL SWITCHGEAR-OC
 - 54 MAGNESIUM HYDROXIDE SYSTEM
 - 55 ROTARY DRUM THICKENER
 - 56 AEROBIC DIGESTER BLOWERS
 - 57 COMPRESSED AIR MIXING SYSTEM
 - 58 ALUM FEED FACILITY
 - 59 ELECTRICAL TRANSFORMER PAD
 - 60 BNR / MBR ELECTRICAL BUILDING
 - 61 SCUM PUMPING SYSTEM

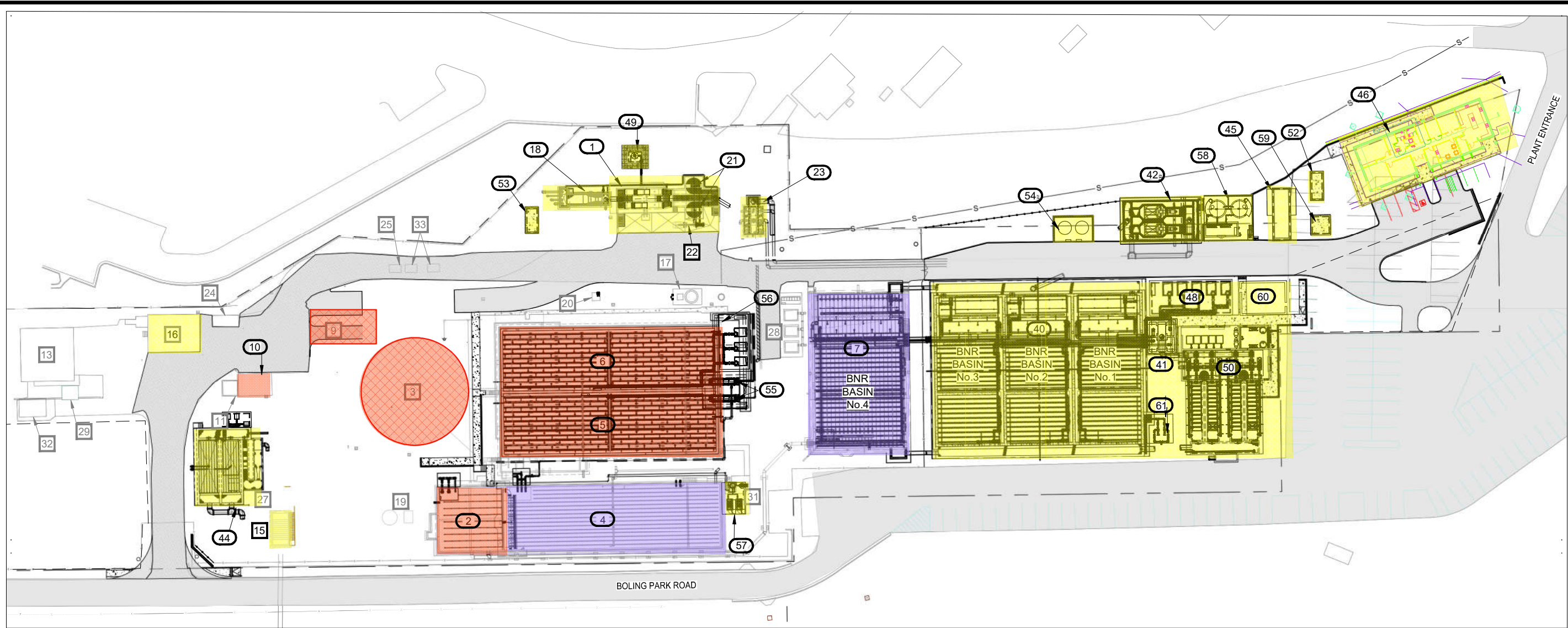
- PHASING PLAN LEGEND:**
- PHASE 1
 - PHASE 2
 - NEW PIPING
 - TEMPORARY PIPING
 - DEMOLISH

ATKINS
1600 RiverEdge Parkway, NW, Suite 700
Atlanta, GA 30328
P: 770-953-0280

HARTWELL ENGINEERS & ARCHITECTS
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DUBLIN, GA 31006
(404) 248-3111

PROJ. NO.:	DATE	REVISION
100061831		
DESIGNED BY:		
DRAWN BY:		
CHECKED BY:		
APPROVED BY:		
DATE: SEPTEMBER 2020		
SCALE:		

CITY OF CANTON, GEORGIA
WATER POLLUTION CONTROL PLANT EXPANSION TO 6 MGD
CONSTRUCTION PHASING SITE PLAN
PHASE 2



CONSTRUCTION PHASING SITE PLAN- PHASE 3
SCALE: 1"=40'

- LEGEND:
EXISTING STRUCTURES/EQUIPMENT
- 1 HEADWORKS
 - 2 EQUALIZATION BASIN
 - 3 DIGESTER
 - 4 SBR No.1
 - 5 SBR No.2
 - 6 SBR No.3
 - 7 SBR No.4
 - 8 MAGNESIUM HYDROXIDE SYSTEM
 - 9 CONTROL BUILDING
 - 10 CHEMICAL BUILDING
 - 11 SODIUM HYPOCHLORITE SYSTEM
 - 12 POLYALUMINUM CHLORIDE SYSTEM

- LEGEND:
EXISTING STRUCTURES/EQUIPMENT (CONTINUED)
- 13 SLUDGE PRESS BUILDING
 - 14 DYNASAND FILTER
 - 15 CASCADE AERATOR
 - 16 OFFICE/ADMINISTRATION BUILDING
 - 17 INFLUENT PUMP STATION
 - 18 INFLUENT METERING FLUME
 - 19 PLANT DRAIN PUMP STATION PS-1
 - 20 FLOW METER VAULT
 - 21 GRIT CHAMBERS
 - 22 GRIT CLASSIFIER
 - 23 SBR SPLITTER BOX
 - 24 EMERGENCY GENERATOR

- LEGEND:
EXISTING STRUCTURES/EQUIPMENT (CONTINUED)
- 25 WATER METER
 - 26 REUSE PUMP STATION
 - 27 UV SYSTEM AND PARSHALL FLUME
 - 28 SBR No.4 BLOWERS
 - 29 SLUDGE VAULT
 - 30 ALUM TANK
 - 31 POST EQUALIZATION BASIN BLOWERS
 - 32 SLUDGE LOADING STATION
 - 33 BACKFLOW PREVENTER
 - 34 AIR COMPRESSOR SHED
 - 35 REUSE WATER METER VAULT
 - 36 REUSE VALVE VAULT

- LEGEND:
(MODIFIED/REPURPOSED STRUCTURES/EQUIPMENT)
- 1 HEADWORKS
 - 2 REUSE WATER WETWELL (FORMER POST EQUALIZATION BASIN)
 - 4 WAS STORAGE (FORMER SBR No.1)
 - 5 AEROBIC DIGESTER (FORMER SBR No. 2)
 - 6 AEROBIC DIGESTER (FORMER SBR No. 3)
 - 7 BNR BASIN No. 4 (FORMER SBR No. 4)
 - 10 CHEMICAL BUILDING MODIFICATIONS
 - 15 CASCADE AERATOR
 - 18 INFLUENT FLUME MODIFICATIONS
 - 19 PLANT DRAIN PUMP STATION PS-1 MODIFICATIONS
 - 21 GRIT CHAMBER MODIFICATIONS
 - 23 SBR SPLITTER BOX MODIFICATIONS

- LEGEND:
(PROPOSED STRUCTURES/EQUIPMENT)
- 40 BNR BASINS No.1, No.2, No.3
 - 41 RAS SPLITTER BOX
 - 42 FINE SCREENINGS FACILITY
 - 43 THICKENING / DEWATERING BUILDING
 - 44 UVPA FACILITY (UV AND POST AERATION)
 - 45 EMERGENCY GENERATOR
 - 46 ADMINISTRATION / CONTROL BUILDING
 - 47 UVPA AERATION BLOWERS
 - 48 AERATION BASIN BLOWERS
 - 49 ODOR CONTROL FACILITY
 - 50 MEMBRANE FACILITY
 - 51 NOT USED
 - 52 ELECTRICAL SWITCHGEAR-MAIN

- CONTINUED
(PROPOSED STRUCTURES/EQUIPMENT - CONTINUED)
- 53 ELECTRICAL SWITCHGEAR-OC
 - 54 MAGNESIUM HYDROXIDE SYSTEM
 - 55 ROTARY DRUM THICKENER
 - 56 AEROBIC DIGESTER BLOWERS
 - 57 COMPRESSED AIR MIXING SYSTEM
 - 58 ALUM FEED FACILITY
 - 59 ELECTRICAL TRANSFORMER PAD
 - 60 BNR / MBR ELECTRICAL BUILDING
 - 61 SCUM PUMPING SYSTEM

- PHASING PLAN LEGEND:
- PHASE 1
 - PHASE 2
 - PHASE 3
 - NEW PIPING
 - TEMPORARY PIPING
 - DEMOLISHED

NOTE:
1. NOT ALL NEW OR TEMPORARY PIPELINES ASSOCIATED WITH THIS PROJECT ARE SHOWN ON THE CONSTRUCTION PLANS.

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PROJ. NO. : 100061831	DESIGNED BY:	REVISION	DATE
DRAWN BY:	CHECKED BY:		
APPROVED BY:	DATE: SEPTEMBER 2020		
SCALE:			
CITY OF CANTON, GEORGIA WATER POLLUTION CONTROL PLANT EXPANSION TO 6 MGD CONSTRUCTION PHASING SITE PLAN PHASE 3			
SHEET NO.			
FIG 4			



NOTE:
1. NOT ALL NEW OR TEMPORARY PIPELINES ASSOCIATED WITH THIS PROJECT ARE SHOWN ON THE CONSTRUCTION PLANS.

CONSTRUCTION PHASING SITE PLAN- PHASE 4
SCALE: 1"=40'



- LEGEND: EXISTING STRUCTURES/EQUIPMENT**
- 1 HEADWORKS
 - 2 EQUALIZATION BASIN
 - 3 DIGESTER
 - 4 SBR No.1
 - 5 SBR No.2
 - 6 SBR No.3
 - 7 SBR No.4
 - 8 MAGNESIUM HYDROXIDE SYSTEM
 - 9 CONTROL BUILDING
 - 10 CHEMICAL BUILDING
 - 11 SODIUM HYPOCHLORITE SYSTEM
 - 12 POLYALUMINUM CHLORIDE SYSTEM

- LEGEND: EXISTING STRUCTURES/EQUIPMENT (CONTINUED)**
- 13 SLUDGE PRESS BUILDING
 - 14 DYNASAND FILTER
 - 15 CASCADE AERATOR
 - 16 OFFICE/ADMINISTRATION BUILDING
 - 17 INFLUENT PUMP STATION
 - 18 INFLUENT METERING FLUME
 - 19 PLANT DRAIN PUMP STATION PS-1
 - 20 FLOW METER VAULT
 - 21 GRIT CHAMBERS
 - 22 GRIT CLASSIFIER
 - 23 SBR SPLITTER BOX
 - 24 EMERGENCY GENERATOR

- LEGEND: EXISTING STRUCTURES/EQUIPMENT (CONTINUED)**
- 25 WATER METER
 - 26 REUSE PUMP STATION
 - 27 UV SYSTEM AND PARSHALL FLUME
 - 28 SBR No.4 BLOWERS
 - 29 SLUDGE VAULT
 - 30 ALUM TANK
 - 31 POST EQUALIZATION BASIN BLOWERS
 - 32 PUMP LOADING STATION
 - 33 BACKFLOW PREVENTER
 - 34 AIR COMPRESSOR SHED
 - 35 REUSE WATER METER VAULT
 - 36 REUSE VALVE VAULT

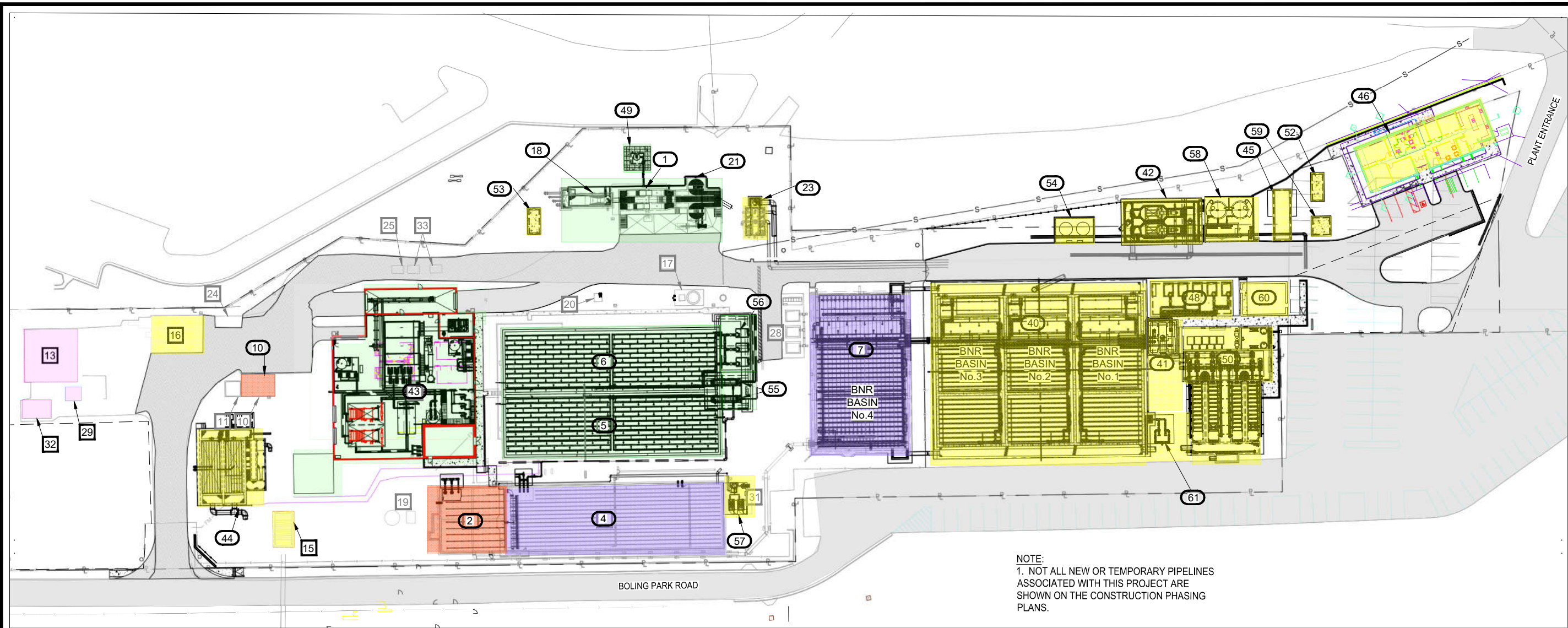
- LEGEND: (MODIFIED/REPURPOSED STRUCTURES/EQUIPMENT)**
- 1 HEADWORKS
 - 2 REUSE WATER WETWELL (FORMER POST EQUALIZATION BASIN)
 - 4 WAS STORAGE (FORMER SBR No.1)
 - 5 AEROBIC DIGESTER (FORMER SBR No. 2)
 - 6 AEROBIC DIGESTER (FORMER SBR No. 3)
 - 7 BNR BASIN No. 4 (FORMER SBR No. 4)
 - 10 CHEMICAL BUILDING MODIFICATIONS
 - 15 CASCADE AERATOR
 - 18 INFLUENT FLUME MODIFICATIONS
 - 19 PLANT DRAIN PUMP STATION PS-1 MODIFICATIONS
 - 21 GRIT CHAMBER MODIFICATIONS
 - 23 SBR SPLITTER BOX MODIFICATIONS

- LEGEND: (PROPOSED STRUCTURES/EQUIPMENT)**
- 40 BNR BASINS No.1, No.2, No.3
 - 41 RAS SPLITTER BOX
 - 42 FINE SCREENINGS FACILITY
 - 43 THICKENING / DEWATERING BUILDING
 - 44 UVPA FACILITY (UV AND POST AERATION)
 - 45 EMERGENCY GENERATOR
 - 46 ADMINISTRATION / CONTROL BUILDING
 - 47 UVPA AERATION BLOWERS
 - 48 AERATION BASIN BLOWERS
 - 49 ODOR CONTROL FACILITY
 - 50 MEMBRANE FACILITY
 - 51 NOT USED
 - 52 ELECTRICAL SWITCHGEAR-MAIN

- CONTINUED (PROPOSED STRUCTURES/EQUIPMENT - CONTINUED)**
- 53 ELECTRICAL SWITCHGEAR-OC
 - 54 MAGNESIUM HYDROXIDE SYSTEM
 - 55 ROTARY DRUM THICKENER
 - 56 AEROBIC DIGESTER BLOWERS
 - 57 COMPRESSED AIR MIXING SYSTEM
 - 58 ALUM FEED FACILITY
 - 59 ELECTRICAL TRANSFORMER PAD
 - 60 BNR / MBR ELECTRICAL BUILDING
 - 61 SCUM PUMPING SYSTEM

- PHASING PLAN LEGEND:**
- PHASE 1
 - PHASE 2
 - PHASE 3
 - PHASE 4
 - NEW PIPING
 - TEMPORARY PIPING
 - DEMOLISH

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PROJ. NO. : 100061831	DATE	REVISION	DATE
DESIGNED BY:			
DRAWN BY:			
CHECKED BY:			
APPROVED BY:			
DATE: SEPTEMBER 2020			
SCALE:			
CITY OF CANTON, GEORGIA WATER POLLUTION CONTROL PLANT EXPANSION TO 6 MGD CONSTRUCTION PHASING SITE PLAN PHASE 4			
SHEET NO.			
FIG 5			



NOTE:
1. NOT ALL NEW OR TEMPORARY PIPELINES ASSOCIATED WITH THIS PROJECT ARE SHOWN ON THE CONSTRUCTION PHASING PLANS.

CONSTRUCTION PHASING SITE PLAN- PHASE 5
SCALE: 1"=40'



- LEGEND:**
EXISTING STRUCTURES/EQUIPMENT
- 1 HEADWORKS
 - 2 EQUALIZATION BASIN
 - 3 DIGESTER
 - 4 SBR No.1
 - 5 SBR No.2
 - 6 SBR No.3
 - 7 SBR No.4
 - 8 MAGNESIUM HYDROXIDE SYSTEM
 - 9 CONTROL BUILDING
 - 10 CHEMICAL BUILDING
 - 11 SODIUM HYPOCHLORITE SYSTEM
 - 12 POLYALUMINUM CHLORIDE SYSTEM

- LEGEND:**
EXISTING STRUCTURES/EQUIPMENT (CONTINUED)
- 13 SLUDGE PRESS BUILDING
 - 14 DYNASAND FILTER
 - 15 CASCADE AERATOR
 - 16 OFFICE/ADMINISTRATION BUILDING
 - 17 INFLUENT PUMP STATION
 - 18 INFLUENT METERING FLUME
 - 19 PLANT DRAIN PUMP STATION PS-1
 - 20 FLOW METER VAULT
 - 21 GRIT CHAMBERS
 - 22 GRIT CLASSIFIER
 - 23 SBR SPLITTER BOX
 - 24 EMERGENCY GENERATOR

- LEGEND:**
EXISTING STRUCTURES/EQUIPMENT (CONTINUED)
- 25 WATER METER
 - 26 REUSE PUMP STATION
 - 27 UV SYSTEM AND PARSHALL FLUME
 - 28 SBR No.4 BLOWERS
 - 29 SLUDGE VAULT
 - 30 ALUM TANK
 - 31 POST EQUALIZATION BASIN BLOWERS
 - 32 SLUDGE LOADING STATION
 - 33 BACKFLOW PREVENTER
 - 34 AIR COMPRESSOR SHED
 - 35 REUSE WATER METER VAULT
 - 36 REUSE VALVE VAULT

- LEGEND:**
(MODIFIED/REPURPOSED STRUCTURES/EQUIPMENT)
- 1 HEADWORKS
 - 2 REUSE WATER WETWELL (FORMER POST EQUALIZATION BASIN)
 - 4 WAS STORAGE (FORMER SBR No.1)
 - 5 AEROBIC DIGESTER (FORMER SBR No. 2)
 - 6 AEROBIC DIGESTER (FORMER SBR No. 3)
 - 7 BNR BASIN No. 4 (FORMER SBR No. 4)
 - 10 CHEMICAL BUILDING MODIFICATIONS
 - 15 CASCADE AERATOR
 - 18 INFLUENT FLUME MODIFICATIONS
 - 19 PLANT DRAIN PUMP STATION PS-1 MODIFICATIONS
 - 21 GRIT CHAMBER MODIFICATIONS
 - 23 SBR SPLITTER BOX MODIFICATIONS

- LEGEND:**
(PROPOSED STRUCTURES/EQUIPMENT)
- 40 BNR BASINS No.1, No.2, No.3
 - 41 RAS SPLITTER BOX
 - 42 FINE SCREENINGS FACILITY
 - 43 THICKENING / DEWATERING BUILDING
 - 44 UVPA FACILITY (UV AND POST AERATION)
 - 45 EMERGENCY GENERATOR
 - 46 ADMINISTRATION / CONTROL BUILDING
 - 47 UVPA AERATION BLOWERS
 - 48 AERATION BASIN BLOWERS
 - 49 ODOR CONTROL FACILITY
 - 50 MEMBRANE FACILITY
 - 51 NOT USED
 - 52 ELECTRICAL SWITCHGEAR-MAIN

- CONTINUED**
(PROPOSED STRUCTURES/EQUIPMENT - CONTINUED)
- 53 ELECTRICAL SWITCHGEAR-OC
 - 54 MAGNESIUM HYDROXIDE SYSTEM
 - 55 ROTARY DRUM THICKENER
 - 56 AEROBIC DIGESTER BLOWERS
 - 57 COMPRESSED AIR MIXING SYSTEM
 - 58 ALUM FEED FACILITY
 - 59 ELECTRICAL TRANSFORMER PAD
 - 60 BNR / MBR ELECTRICAL BUILDING
 - 61 SCUM PUMPING SYSTEM

- PHASING PLAN LEGEND:**
- PHASE 1
 - PHASE 2
 - PHASE 3
 - PHASE 4
 - PHASE 5
 - NEW PIPING
 - TEMPORARY PIPING
 - DEMOLISH

ATKINS		HARTWELL	
1600 RiverEdge Parkway, NW, Suite 700 Atlanta, GA 30328 P: 770-953-0280		196 JOE OWENS CIRCLE DUBLIN, GA 31024 (404) 248-3111	
PROJ. NO. : 100061831	DATE	REVISION	DATE
DESIGNED BY:			
DRAWN BY:			
CHECKED BY:			
APPROVED BY:			
DATE: SEPTEMBER 2020			
SCALE:			
CITY OF CANTON, GEORGIA WATER POLLUTION CONTROL PLANT EXPANSION TO 6 MGD			
CONSTRUCTION PHASING SITE PLAN PHASE 5			
SHEET NO. FIG 6			

File Name: C:\PW_WORK\ATK\KAGAO1\KAMR4306\MS35912\CONSTRUCTION PHASE 2--5.DWG\Tab:FIG 6\Plotted: August 29, 2020 5:17pm

SECTION 01020

ALLOWANCES

PART 1: GENERAL

1.01 SCOPE

- A. The General Contractor shall include with the bid price the following allowance items and amounts for this Contract.
- B. The Contractor's handling costs on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the contract sum and not in the allowance. The Contractor shall cause work covered by these allowances to be performed for such amounts and by such persons as the Owner/Engineer may direct, but he will not be required to employ persons against whom he makes a reasonable objection. If the cost, when determined, is more than or less than the allowance, the Contract Sum shall be adjusted accordingly by Change Order. **Contractor is not entitled to overhead, profit and mark-up on allowance monies not spent.**

1.02 SCHEDULE OF ALLOWANCE ITEMS:

- A. Allowance Item No. 1 – Unforeseen Utility Conflicts and Utility Relocations
 1. The General Contractor shall include in the bid price the following amount for correction of unforeseen utility conflicts and utility relocations as determined by the Owner and Engineer.
 2. Total Allowance Item No. 1 – \$50,000
- B. Allowance Item No. 2 – Owner Initiated Miscellaneous Work
 1. The General Contractor shall include in the bid price the following amount for miscellaneous work as determined by the Owner and Engineer.
 2. Total Allowance Item No. 2 – \$500,000
- C. Allowance Item No. 3 – Miscellaneous Laboratory Equipment
 1. The General Contractor shall include in the bid price the following amount for miscellaneous laboratory equipment as determined by the Owner and Engineer.
 2. Total Allowance Item No. 3 – \$25,000
- D. Allowance Item No. 4 – Office Equipment and Furnishings
 1. The General Contractor shall include in the bid price the following amount for office equipment and furnishings as determined by the Owner and Engineer
 2. Total Allowance Item No. 4 – \$50,000

- E. Allowance Item No. 5 – Office Computer Equipment
 - 1. The General Contractor shall include in the bid price the following amount for office computer equipment as determined by the Owner and Engineer. This equipment will be provided for use in the new office spaces not designated for SCADA or HMI use in this project
 - 2. Total Allowance Item No. 5 – \$15,000
- F. Allowance Item No. 6 – Bulk Chemicals
 - 1. The General Contractor shall include in the bid price the following amount for bulk chemicals as determined by the Owner and Engineer. This allowance item includes filling the storage tanks associated with the MBR CIP system, as well as polymer systems located at the Solids Handling Building.
 - 2. Total Allowance Item No. 6 – \$15,000
- G. Allowance Item No. 7 – Geotechnical/Materials Testing
 - 1. The General Contractor shall include in the bid price the following amount for Geotechnical/Materials Testing as determined by the Owner and Engineer.
 - 2. Total Allowance Item No. 7 – \$150,000
- H. Allowance Item No. 8 – Utility Vehicle Allowance
 - 1. The General Contractor shall include in the bid price the following amount for the purchase of a Utility Vehicle to be coordinated and provided early in the project as determined by the Owner and Engineer.
 - 2. Total Allowance Item No. 8 – \$20,000
- I. Allowance Item No. 9 – Site Landscaping
 - 1. The General Contractor shall include in the bid price the following amount for site landscaping as determined by the Owner and Engineer.
 - 2. Total Allowance Item No. 9 – \$100,000
- J. Allowance Item No. 10 – Plant Control System Additional Hardware, Software, and Fees
 - 1. The General Contractor shall include in the bid price the following amount for plant control system additional hardware, software, and fees as determined by the Owner and Engineer.
 - 2. Total Allowance Item No. 10 – \$50,000
- K. Allowance Item No. 11 – Additional Electrical Equipment
 - 1. The General Contractor shall include in the bid price the following amount for additional electrical equipment as required by the power system study and harmonic analysis, as determined by the Owner and Engineer.
 - 2. Total Allowance Item No. 11 – \$75,000

- L. Allowance Item No. 12 – Demolition and Restoration of Existing Sludge Press Building
 - 1. The General Contractor shall include in the bid price the following amount for demolition and restoration of the existing sludge press building, as determined by the Owner and Engineer.
 - 2. Total Allowance Item No. 12 – \$50,000

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

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SECTION 01035

MAJOR EQUIPMENT ALLOWANCES

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. The Owner has selected several major equipment items for this contract. Installation, unloading, storage and any other costs associated with the piece of equipment not specifically quoted in the equipment supplier's proposal shall be included in the Bidder's Lump Sum Bid proposal.
- B. A complete scope of equipment and services to be furnished by the manufacturer is included in Appendices of these Contract Documents.
 - 1. Appendix A: Membrane System
 - 2. Appendix B: Sludge Drying System
 - 3. Appendix B: Pista Grit Vortex Grit and Cyclone System

1.02 EQUIPMENT SUPPLY CONTRACT

- A. The awarded construction bidder will enter into an equipment supply contract with each major equipment supplier. The Contractor shall be responsible for the timetable and schedule of the equipment in relationship with the remainder of the project.

1.03 SUBMITTALS

- A. The equipment supplier shall submit shop drawings and operation and maintenance manuals as described in Section 01300 Submittals and Section 01730 Operating and Maintenance Manual. The submittals shall be coordinated through the Contractor including review and submission

1.04 DELIVERY/UNLOADING

- A. All equipment prices are to include the cost of delivery to the site. The Contractor shall be responsible for unloading, storing, and installing the proposed equipment. The manufacturer shall maintain all responsibility, including: insurance, losses and damages, for the equipment through delivery at the site

1.05 SALES TAX

- A. Sales tax is **NOT** included in the allowance price given to the Contractor.

1.06 METHOD OF PAYMENT

- A. Payment for the equipment furnished on the construction contract will be made to the manufacturer through the General Contractor. Payments to the Contractor and thus to the equipment manufacturer will be made on the following schedule:
 - 1. For equipment lump sum prices. (running totals)
 - a. Upon Approval of Shop Drawing: 10%

- b. Upon Delivery to the Job Site: 70%
 - c. Upon Completion of Installation: 90%
 - d. Upon Successful Start-Up and Acceptance by Owner: 100%
 - 2. For equipment manufacturer's services listed in the proposal
 - a. Upon performance of service: 100%
- B. Retainage
- 1. Retainage will be held on the equipment manufacturer through the Contractor. The Owner will hold ten percent (10%) of the stored equipment cost submitted on the Contractor's pay requests. Additional retainage will not be withheld on equipment. Retainage will not be withheld on services. Upon final acceptance by the Owner, retainage on manufacturer's equipment shall be released.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

SECTION 01041

COORDINATION OF WORK

PART 1: GENERAL

1.01 GENERAL

- A. Contractor is solely responsible for coordination of all of the Work. The Contractor shall supervise, direct and cooperate fully with all subcontractors, manufacturers, fabricators, suppliers, distributors, installers, testing agencies and all others whose services, materials or equipment are required to ensure completion of the Work within the Contract Time and in accordance with the Contract Documents.
- B. Contractor shall maintain sufficient competent personnel, equipment and supplies at the site for the purpose of preparing layout and coordination drawings. These drawings shall supplement the Contract Documents, and the working and Shop Drawings as necessary to correlate the work of various trades. Where such drawings are to be prepared by the mechanical, electrical, plumbing or heating and ventilating Subcontractors, the Contractor will ensure that each Subcontractor maintains the required personnel and facilities at the site.

1.02 MAINTENANCE OF PLANT OPERATIONS

- A. Contractor shall maintain plant operations per Section 01520 Maintenance of Plant Operations.

1.03 ORDER OF WORK

- A. Perform work in an order to expedite the construction and completion of the project.
- B. Contractor to coordinate work to assure compliance with schedules.

1.04 MEETINGS

- A. Contractor to attend and participate in all project coordination or progress meetings and report on the progress of all work and compliance with schedules.

1.05 CLEANUP ACTIVITIES

- A. The Contractor shall clean the work site of all trash and foreign object debris on a daily basis.

1.06 HAZARD CONTROL

- A. The Contractor shall store volatile wastes in covered metal containers and remove from premises daily.
- B. The Contractor shall prevent accumulation of wastes which create hazardous conditions.

- C. Burning or burying rubbish and waste materials on the site shall not be allowed.
- D. Disposal of volatile wastes into sanitary or storm sewers shall not be allowed.

1.07 DISPOSAL OF SURPLUS MATERIALS

- A. Unless otherwise shown on the Drawings, specified or directed, the Contractor shall dispose of all surplus excavated materials and materials and equipment from demolition, legally off the site, and shall provide his own suitable, off-site spoil area, or on a site designated by the Owner.
- B. The Owner shall have the opportunity to inspect any materials removed prior to disposal by the Contractor. If said materials are determined to be salvageable by the Owner, the Contractor shall transport and unload said material to an area designated by the Owner.

1.08 FINAL CLEANING

- A. The Contractor responsibilities:
 - 1. Schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on wet, newly painted surfaces.
 - 2. Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.
 - 3. Employ experienced workmen or professional cleaners for final cleaning.
 - 4. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces and of concealed spaces.
 - 5. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces so designated to shine finish.
 - 6. Repair, patch, and touch up marred surfaces to specified finish to match adjacent surfaces.
 - 7. Broom clean paved surfaces; rake clean other surfaces of grounds.
 - 8. Clean screens on air intake vents.
 - 9. Upon completion of the work, Contractor shall remove from the site all plant, material, tools and equipment belonging to him, and leave the site with an appearance acceptable to the Engineer.
 - 10. The Contractor shall thoroughly clean all equipment and materials installed by him and shall deliver over such materials and equipment in a bright, clean, polished and new-appearing condition.

11. Restoration of Landscape Damage: Any landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the Contractor's expense. The Engineer will decide what method of restoration shall be used.
12. Post-Construction Cleanup: The Contractor shall remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction.

PART 2: (Not Used)

PART 3: (Not Used)

END OF SECTION

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SECTION 01095

REFERENCE STANDARDS AND DEFINITIONS

PART 1: GENERAL

1.01 DEFINITIONS

- A. *Indicated*: Graphic representations, notes, or schedules on the Drawings; Paragraphs or Schedules in the Specifications; and similar requirements in the Contract Documents. Terms such as shown, noted, scheduled and specified are used to help the reader locate the reference. There is no limitation on location.
- B. *Directed*: Terms such as directed, requested, authorized, selected, approved, required and permitted mean directed by the Engineer, requested by the Engineer and similar phrases.
- C. *Approve*: When used in conjunction with the Engineer's action on submittals, applications and requests, is limited to the Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- D. *Regulation*: Includes laws, ordinances, statutes and lawful orders issued by authorities with jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the Work.
- E. *Furnish*: To supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation and similar operations.
- F. *Install*: Describes operations at the Project site including unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations to make ready for intended use.
- G. *Provide*: Furnish and install, complete and ready for the intended use.
- H. *Installer*: The Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
- I. The term experienced, when used with the term Installer means having a minimum of five previous projects similar in size and scope to this Project, being familiar with the special requirements indicated and having complied with requirements of the authority with jurisdiction.
- J. *Project Site*: The space available for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

1.02 TESTING AGENCIES

- A. A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.03 SPECIFICATION FORMAT

- A. These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16 Division format.
- B. *Abbreviated Language:* Language used in Specifications is abbreviated. Implied words and meanings shall be interpreted as appropriate. Singular words will be interpreted as plural where applicable and the context so indicates.
- C. Imperative language is used generally. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
 - 1. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

1.04 COPIES OF STANDARDS

- A. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.

1.05 ABBREVIATIONS AND NAMES

- A. Where acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authority with jurisdiction, or other entity applicable to the context of the Text provision except where otherwise shown on the drawings or specifications. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

1.06 PERMITS, LICENSES AND CERTIFICATES

- A. For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1: GENERAL

1.01 GENERAL

- A. No quantities shall be measured for payment except items listed in the proposal, unless the Owner has approved "extra" work in accordance with the contract documents and has so advised the Contractor before the work was actually performed.
- B. Any and all other materials, labor, etc., furnished and required shall be considered as incidental to the items to be measured.
- C. The unit or lump sum prices bid for the various items shall be full compensation for furnishing all materials, tools, equipment, labor and incidentals necessary and/or required to complete the work as shown on the plans and called for in these specifications.
- D. The quantities to be paid for shall be determined by actual measurement of the amounts placed. The Engineer shall make all measurements and the Contractor shall make certain all work has been measured before concealing; otherwise, he may be required to uncover or make accessible any work so concealed in order to receive payment for such items.

1.02 LUMP SUM ITEMS

- A. All items shown on the plans or called for in the specifications and not specifically shown in the proposal as being included in another payment item will be paid for at the lump sum price shown in the proposal. Lump sum items will be paid for based upon approved construction schedules and percentage of lump sum item actually completed at time of pay request.

1.03 STORED MATERIALS

- A. Stored materials prices will be reimbursable at the price paid for the product by the Contractor. Only those materials which are properly stored on the job site to the approval of the Engineer will be paid for as stored material and a bill-of-sale for each item must be submitted with each monthly pay request for stored material. A ten percent retainage shall be held on stored materials. All cost associated with covering and protecting stored materials and equipment will be borne by the Contractor.

1.04 UNIT PRICE ITEMS – ADD/DEDUCT

- A. All unit price items must be provided by the Contractor to the Engineer before placing by the Contractor. All items required for normal construction will be included in the Lump Sum Bid. Unit price items will be paid for at the bid price per unit executed to the satisfaction of the Engineer. Delivery tickets will be used to establish the quantity of concrete and stabilizer stone to be paid for as unit price items.

- B. Unit priced items will be used in obtaining change order pricing for both additions and deletions. The unit price quantities are shown for bidding purposes and any item requested shall not be governed by the quantity shown.
- C. Work described under these price items is outside the scope of work as shown on the plans or called for in the specifications. The cost of all work as shown on the plans or called for in the specifications shall be paid under the Lump Sum Item.
- D. Definitions of various unit prices are:
 - 1. Rock Excavation: The unit price shall include all cost associated with removing solid rock to 6" below the required grade and replacing with compacted stone.
 - 2. Subgrade Stabilizer: The unit price shall include all cost associated with the delivery and compaction of the size stone as directed by the Engineer.
 - 3. Excavation and Backfill: The unit price shall include all cost associated with the removal of soil and the delivery and compaction of the select backfill material as directed by the Engineer.
 - 4. Concrete: The unit price shall include all delivery, installation and curing cost associated with installing concrete as directed by the Engineer.
 - 5. Formwork: The unit price shall include all delivery, installation and removal cost associated with installing formwork to retain concrete until cured as directed by the Engineer.
 - 6. Reinforcing Steel: The unit price shall include all delivery and installation costs associated with installing reinforcing steel.
 - 7. Fittings: The unit price shall include all delivery and installation of ductile iron fittings as directed by the Engineer. This price shall include all gaskets, nuts, bolts, and glands. The unit price shall come from the manufactures printed weights for the fitting only.
 - 8. Rip Rap: The unit price shall include all delivery and installation of rip rap and shall include a layer of non-woven fabric equal to Nicolon 70/60 under the riprap. The unit price per square yard shall include a depth of 24".
 - 9. Silt Fence: The unit price shall include all delivery and installation of silt fence. *Silt Fence shall be Type C.*
 - 10. Asphalt Drives: The unit price shall include all delivery and installation of asphalt and stone base per the typical asphalt section shown on the plans. This shall also include fine grading for this item.
 - 11. Gravel Drives: The unit price shall include all delivery and installation of graded aggregate base for gravel drives. The minimum depth of base material shall be 6". It shall include all compaction and fine grading required.

1.05 PAYMENT SCHEDULE

- A. Prior to the first application for payment, the Contractor shall submit a detailed pay schedule. The schedule shall list the major items of construction, such as;

clearing, roads, excavation, reinforced concrete, miscellaneous metals, masonry work, major equipment, valves and piping, electrical and controls. The Contractor shall list an estimated cost on each item with the items totaling the lump sum bid price. The Contractor shall include materials and equipment costs with each item, so the Engineer can evaluate and approve his schedule. The Engineer reserves the right to adjust the schedule. The schedule will then be used in determining the percentage for payment. The Contractor shall furnish a line item in his estimate for any item where a stored material will be submitted. The stored material plus installation amount may not be larger than the total amount on the estimate.

END OF SECTION

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SECTION 01152

APPLICATIONS FOR PAYMENT

PART 1: GENERAL

1.01 SUBMITTAL

- A. Submit applications for Payment to the Engineer in accord with the schedule established by Conditions of the Contracts and Agreements between Owner and Contractor.
- B. Related Requirements in other parts of these specifications:
 - 1. Lump Sum: Agreement between Owner and Contractor.
 - 2. Progress payments, retainage and final payment: Conditions of the Contract.
- C. Related Requirements specified in other Sections:
 - 1. Contract Closeout: Section 01700

1.02 FORMAT AND DATA REQUIRED

- A. Submit applications on a form approved by Engineer, with itemized data typed in proper format. All pages of the payment application shall be 8.5" x 11".

1.03 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:
 - 1. Project.
 - 2. Application number and date.
 - 3. Detailed list of enclosures.
 - 4. For stored products:
 - a. Item number and identification as shown on application.
 - b. Description of specific material.
- B. Submit one copy of data and cover letter for each copy of application.

1.04 SUBMITTAL PROCEDURE

- A. Contractor shall provide a draft application to the Owner's on-site Representative for review. Any discrepancies shall be addressed prior to formal submittal
- B. Submit application for payment to the Engineer at the times stipulated in the Agreement.
- C. Number: Five copies of each application.

- D. When the Engineer finds the application properly completed and correct, he will transmit a certificate for payment to Owner, with a copy to Contractor.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1: GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

- A. This Section specifies the general methods and requirements of submissions applicable to Shop Drawings, Product Data, Samples, Construction Photographs, Submittal Schedules. Additional general submission requirements are contained in the General Conditions. Detailed submittal requirements are specified in the technical Sections.
- B. All submittals shall be clearly identified by reference to Section Number, Paragraph, Drawing Number or Detail as applicable. Submittals shall be clear and legible and of sufficient size for presentation of data.
- C. Electronic submission of submittals in PDF format is acceptable with the exception of product samples and submittals containing documents larger than 11x17 sheets. Full size drawings reduced to half size to meet the electronic submittal requirements shall be rejected.
- D. If the Engineer determines that the majority of submittals provided to the Engineer have been insufficient and have not met or provided the information necessary to verify the proper selection of equipment or material, the Engineer shall require that the Contractor provide notes in a copy of the specification showing that each paragraph of the specification section has been addressed. This noted copy of the specification shall be attached to each submittal as proof that the Contractor has verified that the submittal to the Engineer does address all requirements of the specification. No additional payment will be made to the Contractor for this effort.
- E. Submit shop drawings, product data, and samples required by the Contract Documents. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed shop drawings, product data and samples will be needed.

1.02 SHOP DRAWINGS, PRODUCT DATA, SAMPLES

A. Shop Drawings

- 1. Shop drawings as specified in individual Sections include custom-prepared data such as fabrication and erection/installation (working) drawings, scheduled information, setting diagrams, actual shop work, manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the work.
- 2. All submittals containing more than two sections shall include a Table of Contents. Submittals containing multiple products, such as instrumentation devices or valve types, shall include a Table of Contents and each page shall be numbered sequentially in each section of the submittal. Submittals containing multiple devices or sections that are not organized accordingly shall be rejected without further review.

3. All shop drawings submitted by subcontractors shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
4. All details on shop drawings shall show clearly the relation of the various parts to the main members and lines of the structure and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the drawings before being submitted.
5. Check all subcontractor's shop drawings regarding measurements, size of members, materials and details to make sure that they conform to the intent of the Drawings and related Sections. Return shop drawings found to be inaccurate or otherwise in error to the subcontractors for correction before submission thereof.

B. Product Data

1. Product data as specified in individual Sections include, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the work.

C. Samples

1. Samples specified in individual Sections include, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
 1. Field measurements
 2. Field construction criteria
 3. Catalog numbers and similar data
 4. Conformance with related Sections
- B. Each shop drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: "Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other

applicable approved shop drawings and all Contract requirements." Shop drawings and product data sheets 11-in x 17-in and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Resident Project Representative a copy of each transmittal sheet for shop drawings, product data and samples at the time of submittal to the Engineer.

- C. The Contractor shall utilize a 9-character submittal identification numbering system in the following manner:
1. The first five digits shall be the applicable Section Number.
 2. The next three digits shall be the numbers 001 to 999 to sequentially number each initial separate item or drawing submitted under each specific Section Number.
 3. The last character shall be a letter, A to Z, indicating the submission, or resubmission of the same Drawing, i.e., A=1st submission, B=2nd submission, C=3d submission, etc. A typical submittal number would be as follows:
03300-008-B
03300 = Section for Concrete
008 = The eighth initial submittal under this section
B. =The second submission (first resubmission) of that shop drawing
- D. Notify the Engineer in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.
- E. The review and approval of shop drawings, samples or product data by the Engineer shall not relieve the Contractor from the responsibility for the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Engineer will have no responsibility therefor.
- F. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- G. Project work, materials, fabrication, and installation shall conform with approved shop drawings, applicable samples, and product data.

1.04 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the Work or in the work of any other contractor.
- B. Each submittal, appropriately coded, will be returned within 30 working days following receipt of submittal by the Engineer.
- C. Number of submittals required:

1. Shop Drawings: Six copies.
2. Product Data: Three copies.
3. Samples: Submit the number stated in the respective Sections.

D. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The Project title and number.
3. Contractor identification.
4. The names of:
 - a. Contractor
 - b. Supplier
 - c. Manufacturer
5. Identification of the product, with the section number, page and paragraph(s).
6. Field dimensions clearly identified as such.
7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal Standards numbers.
9. Identification of deviations from Contract Documents.
10. Identification of revisions on resubmittals.
11. A blank space suitably sized for Contractor and Engineer stamps.
12. Where calculations are required to be submitted by the Contractor, the calculations shall have been checked by a qualified individual other than the preparer. The submitted calculations shall clearly show the names of the preparer and of the checker.

1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

- A. The review of shop drawings, data and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:
1. as permitting any departure from the Contract requirements.
 2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials.
 3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.
- B. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.

- C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or Contract Time, the Engineer may return the reviewed drawings without noting an exception.
- D. Submittals will be returned to the Contractor under one of the following codes.
- Code 1: "APPROVED" is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.
- Code 2: "APPROVED AS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product and included in the Operations and Maintenance Manual.
- Code 3: "APPROVED AS NOTED/RESUBMIT". This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package. This resubmittal is to address all comments, omissions and non-conforming items that were noted. Resubmittal is to be received by the Engineer within 15 calendar days of the date of the Engineer's transmittal requiring the resubmittal. This code indicates that work may proceed provided that it complies with the notations or corrections on the submittal and contract documents.
- Code 4: "NOT APPROVED" is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.
- Code 5: "FOR INFORMATION ONLY". This code is assigned when items are reviewed, but not for approval or disapproval.
- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall identify all revisions made to the submittals, either in writing on the letter of transmittal or on the shop drawings by use of revision triangles or other similar methods. The resubmittal shall clearly respond to each comment made by the Engineer on the previous submission. Additionally, the Contractor shall direct specific attention to any revisions made other than the corrections requested by the Engineer on previous submissions.
- F. Partial submittals may not be reviewed. The Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor and will be considered "Not Approved" until resubmitted. The Engineer may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.
- G. Repetitive Review
1. Shop drawings and other submittals will be reviewed no more than twice at the Owner's expense. All subsequent reviews will be performed at times convenient to the Engineer and at the Contractor's expense, based on the Engineer's then

prevailing rates. The Contractor shall reimburse the Owner for all such fees invoiced to the Owner by the Engineer. Submittals are required until approved.

2. Any need for more than one resubmission, or any other delay in obtaining Engineer's review of submittals, will not entitle Contractor to extension of the Contract Time.
- H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Engineer at least 7 working days prior to release for manufacture.
- I. When the shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

1.06 DISTRIBUTION

- A. Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the Engineer. Number of copies shall be as directed by the Engineer but shall not exceed six.

1.07 CONSTRUCTION PHOTOGRAPHS (NOT USED)

- A. See Section 01380 Construction Photographs.

1.08 SCHEDULES

- A. Provide all schedules required herein and in the General Conditions.
- B. Provide construction schedule as specified in Section 01311 Construction Schedules and Meetings.
- C. The monthly Schedule update (monitoring) shall include the following items:
1. Network
 - a. Identify activities that are completed or in process by contrasting heavy lines. Each activity worked on should be proportional to the percentage of progress achieved to date.
 - b. Identify restraints imposed by material deliveries, precedent activity durations or schedule adjustments on the monthly update of the Network.
 2. Computer Print-out
 - a. Show the percentage progress status of each activity. The percentage progress status will be used to support each Contractor's periodic pay estimate.
 - b. Show actual start and completion dates.
 - c. Flag all activities started and in progress.
- D. Supplemental to the Critical Path Schedule, the Contractor shall provide a detailed work schedule, projected at least a month in advance. The implementation of the work schedule and the coordination required will constitute the basic agenda of the coordination and planning meetings.

1.09 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

- A. If specifically required in other related Sections, submit a P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

1.10 GENERAL PROCEDURES FOR SUBMITTALS

- A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work of other related Sections, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

1.11 SUPPLEMENTS

- A. P.E. Certification Form

END OF SECTION

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a professional engineer registered in the (State/Commonwealth of) _____, and that he/she has been employed by (Name of Contractor) _____ to design (Insert P.E. Responsibilities) _____ in accordance with Section _____ for the Canton Wastewater Treatment Plant Expansion to 6 MGD.

The undersigned further certifies that he/she has performed the design and that said design is in conformance with all applicable local, state and federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the Owner or Owner's representative within seven days following written request by the Owner.

P.E. Name (Print)

Contractor's Name (Print)

Signature

Signature

Company Name

Title

Street Address

City, State, Zip

SECTION 01311

CONSTRUCTION SCHEDULES AND MEETINGS

PART 1: GENERAL

1.01 DESCRIPTION

- A. The Contractor shall prepare a Preliminary Construction Schedule, Complete Baseline Construction Schedule, and monthly schedule progress updates as specified herein.
- B. Prepare and submit the schedules using the Critical Path Method (CPM) within Oracle's Primavera P6 Professional Release 18.

1.02 RELATED SECTIONS

- A. Section 01015 Sequence of Work
- B. Section 01035 Major Equipment Allowances
- C. Section 01300 Submittals

1.03 QUALIFICATIONS OF SCHEDULER

- A. Prior to submitting the Preliminary Construction Schedule, submit a statement of the scheduler's qualifications. The scheduler shall have a minimum of five (5) years' of experience in developing, updating, and monitoring CPM schedules within Primavera P6.
- B. The scheduler shall have experience in maintaining a CPM schedule for at least one municipal water or wastewater treatment plant or pumping station project whose construction duration was at least one year and whose contract value was at least \$20 million.
- C. Submit two (2) professional references, including name, title, phone number, and email address for two separate projects. Contact each reference and ask permission to submit as a reference first.

1.04 PRECONSTRUCTION CONFERENCE

- A. After award of the bid and prior to beginning construction, a conference will be held with representatives of the Contractor, Owner, Engineer to discuss schedules and the Project. This conference is intended to establish lines of communication between the parties involved. Time and place of preconstruction conference will be determined at time of bid award.
- B. There is no separate measurement for the preconstruction conference. No payment will be made for the preconstruction conference as such; the cost therefore is considered part of the bid price.
- C. Preconstruction conference shall be extended for no more than two (2) consecutive days.
- D. The Contractor shall ensure that appropriate staff are in attendance, including any major Subcontractors that the Contractor deems as essential.

1.05 CONSTRUCTION MEETINGS

- A. A construction meeting will be held biweekly. The meeting shall be held on site at a time and date mutually agreed upon by the Contractor and Engineer and Owner.
- B. Contractor, Engineer and Owner representative are required to attend construction meetings.
- C. No payment will be made for progress meetings as such; the cost is considered included in the bid price.
- D. Additional meetings shall be held on a two-week repeating schedule to address construction delays at the request of the Owner at no additional cost to the Owner.

PART 2: PRODUCTS (NOT USED)

PART 3: EXECUTION

3.01 SCHEDULE DELIVERY REQUIREMENTS

- A. Within 15 days after the Notice to Proceed (NTP) date, prepare and submit a Preliminary Construction Schedule that includes:
 - 1. Activities (with cost and resource loading) to be performed during the first 120 calendar days after Notice to Proceed.
 - 2. A preliminary Work Breakdown Structure (WBS) for all activities required to finish the entire project. The durations, predecessor/ successor relationships, and cost and resource loading for activities beyond the first 120 calendar days after Notice to Proceed are not required for the Preliminary Construction Schedule.
- B. Within 60 days after the Notice to Proceed (NTP) date, prepare and submit a Complete Baseline Construction Schedule that includes:
 - 1. Activities (with cost and resource loading) to be performed during the entire Contract Duration up to Final Completion.
 - 2. In addition to construction activities, show administrative and procurement activities including, but not limited to:
 - a. Preparation, review time, and approval of submittals.
 - b. Obtaining and renewing licenses, certificates, permits and approvals.
 - c. Procurement, fabrication, delivery, installation, testing, and startup of equipment and materials.
 - d. Training of City personnel in use of equipment.
 - e. Substantial Completion, Final Completion, and other applicable milestone dates.
 - 3. Indication of activities dependent on seasonal weather conditions (e.g. dates that concrete placement and permanent grass seeding is allowed, etc.).

4. Calendars that show working days and holidays for the Contractor, as well as weather dependent seasonal calendars.

C. Deliverables:

1. Electronic .XER file for the Primavera P6 schedule.
2. Five (5) hard copies of the schedule as specified herein, printed on 22" x 34" paper, with the activities shown in a Gantt Chart format. Include an electronic pdf file of the hard copy of the schedule.
3. Reports in electronic pdf format as specified herein.

3.02 DETAILED REQUIREMENTS

A. Provide the following information as a minimum for each activity:

1. Activity number. Each activity number shall have a minimum of five characters.
2. Activity description will clearly describe the work to be done, and the physical location on the property.
3. Duration of activity in units of working days.
4. Early start, early finish, late start, late finish, actual start, and actual finish dates.
5. Total float and free float.
6. Original duration, Activity percent complete, and remaining duration.
7. Activity cost value.
8. Responsibility code for each activity (General Contractor, subcontractors, suppliers, and the City).
9. Required manpower, by labor trade (excavation, pipe laying, concrete pouring, equipment installation, electrical, etc), on a single person basis. Do not list manpower by crews.
10. Required equipment, by each individual piece of equipment.

B. Observe the following rules when sequencing activities and setting the duration of activities:

1. Use finish-finish, finish-start, or start-start relationships between activities. Do not use Start-finish relationships.
2. All activities shall have both a predecessor and successor activity, except for the first activity which shall have no predecessor, and the last activity which shall have no successor.
3. Do not use lags or leads for activities.
4. Show duration of each activity in working days, with a minimum of one (1) working day and maximum of twenty (20) working days for any construction

activity. Material and equipment related procurement and delivery activities may last longer than twenty working days.

5. Include durations as required in Section 01300 for City's review of Contractor's submittals.
6. Base activity duration on the planned labor and equipment resource loading required to perform the activity.
7. Explain and justify the use of scheduling and resource constraints in the scheduling logic.

C. Cost and Resource Loading Requirements:

1. Assign a cost to each activity. Do not assign costs to administrative and procurement activities such as submittal of shop drawings, unless they are allowed in Section 01035.
2. Cost load activities that represent delivery of the major equipment as specified in Section 01035.
3. The sum of the assigned costs shall equal the Contract value, including all Change Orders.
4. Resource load the schedule with the labor resources required for each activity. Include labor resources for the General Contractor and all subcontractors.
5. Resource load the schedule with the equipment resources required for each activity. Include each piece of equipment used by the General Contractor and all subcontractors.

3.03 PRESENTATION FORMATS AND REPORTS

A. Requirements

1. The specified format shall be used, and specified reports shall be included in the Preliminary Construction Schedule, Complete Baseline Construction Schedule, and Monthly Schedule Updates.

B. Gantt Chart Format

1. Plot the Gantt Chart to show a continuous flow from left to right.
2. Include a calendar along the entire length of each sheet with each activity plotted so that the beginning and completion dates of each activity are shown in proper calendar scale.
3. Use a time scale that clearly conveys the activities, logic, durations, and activity data in an easily readable manner.
4. Show activities, activity numbers, and lines showing the predecessor/ successor relationships between activities.
5. Show the critical path(s) in red.
6. Show total float, and actual completion dates for each activity.

C. Narrative Report

1. Describe the general approach that will be used to meet milestones and completion dates.
2. Discussion of key activities on the Critical path, and the approach to ensure that total float on the critical path does not decrease further.
3. Discussion of key activities on near critical paths (those with total float of 20 workdays or less), and the approach to ensure that near critical paths do not become critical.
4. Discussion of any critical resources that impact the schedule, and the approach to ensure that sufficient resources are devoted to the project.

D. Submit the following activity reports:

1. Activities in ascending order by activity number, with Predecessors/ successors, Early and Late Start and Finish dates, Total and Free Float, Duration, Status, and Critical Status.
2. Predecessors/ successors for each activity in ascending order by Activity number.
3. Total float, in ascending order, for all activities. List activities with equal total float in ascending order by Early Start Date.
4. A listing of all activities on the critical path(s), sorted in ascending order by Early Start Date.

E. Resource usage curve and report showing labor and equipment resources required for each workday, with each resource identified by activity number.

F. Develop a cash flow analysis:

1. Present cash flow analysis based on the cost assigned to each work activity.
2. Estimate cash draw down by month over the duration of the project.
3. Show cash flow for both early finish and late finish of activities.

3.04 REVIEW OF SCHEDULES

A. Participation

1. Participate in Engineer's review and evaluation of submitted schedules and reports.
2. Allow 30 days for Engineer to return review comments.

B. Conditions

1. Except for the costs of bonds and insurance, progress payments will be withheld pending Engineer's approval of the Complete Baseline Construction Schedule.
2. Engineer's review and acceptance of Contractor's schedule is for conformance to requirements of the Contract Documents.

3. Engineer's review and acceptance of Contractor's schedule does not relieve Contractor of any responsibilities for accuracy or feasibility of schedule, or of Contractor's ability to meet interim project milestone dates and Contract completion dates.
4. Engineer's review and acceptance does not warrant, acknowledge or admit the reasonableness of the logic, durations, or resource loading of Contractor's schedule.

3.05 MONTHLY SCHEDULE UPDATES

A. Purpose

1. After the Engineer's approval of the Complete Baseline Construction Schedule, submit monthly schedule updates to reflect actual progress on the project.
2. The monthly schedule updates shall be the basis of monthly progress payments to the Contractor.
3. Before submitting each monthly schedule update, participate in a meeting with the Engineer to verify progress and review modifications to the schedule network logic prior to the formal submittal. This meeting may be part of a regularly scheduled construction progress meeting.

B. Monthly Narrative Progress Report

1. Describe the activities performed during the previous month and the activities scheduled to be performed during the next month.
2. Status of Contract completion dates and the number of workdays ahead or behind schedule.
3. Current and anticipated problem areas.
4. Descriptions and causes of any delays, and the impacts of any delays on activities, milestones, and completion dates.
5. Explanation of implemented and proposed corrective actions, required to correct any delays.
6. Approved and proposed changes in construction sequence.
7. The impact of approved and proposed design revisions, change orders, and field orders on the schedule.

C. Submit Activity Reports:

1. As described elsewhere in this Section.
2. For activities started and/or completed during the reporting period, list actual start and actual completion dates, and percent complete based on progress (not duration).
3. For activities not yet started, list projected start and completion dates.

- D. An updated Resource usage curve and report showing planned versus actual resources used, for both labor and equipment resources.
- E. An updated cash flow analysis showing planned versus actual funds expended, plus a forecast of the remaining payments.
- F. Monthly Progress Payments:
 - 1. The activity cost values and the percentage complete for each activity will be the basis of monthly progress payments to the Contractor.
 - 2. Before submitting each monthly progress payment application, meet with the Engineer to reach agreement on the percentage complete for each activity.
- G. Generate Primavera P6 Visualizer Reports that show the following differences between the current and previous monthly schedule updates:
 - 1. General Relationship Differences: Relationship Lag and Predecessor Activity ID
 - 2. Relationship Changes: Added and Deleted Predecessor and Successor Relationships, Added and Deleted Activities.

3.06 REVISIONS TO SCHEDULE

- A. General
 - 1. Make revisions or additions to the approved Complete Baseline Construction Schedule only after obtaining the Engineer's approval.
 - 2. Float time is not for the exclusive use or benefit of either the City or the Contractor, but is available to both parties, as needed, to meet Contract milestones and the Contract completion date.
- B. Revise the schedule and submit supporting data, at no additional cost, when:
 - 1. A change or delay affects, by twenty or more work days, contractual milestone dates or completion dates. The Engineer may require the Contractor to develop a Recovery Schedule to demonstrate how the lost time will be recovered.
 - 2. A submittal is marked ""APPROVED AS NOTED/ RESUBMIT" or "NOT APPROVED", add the additional sequential activities for re-submittal and re-review.
 - 3. Re-work is required due to the original Work not complying with the Contract Documents. Add additional sequential activities for the Re-work.
- C. Weather Delays
 - 1. The Contract Time allowed for substantial completion and final completion specified in the Bid Form already includes an allowable number of lost workdays due to weather by season:
 - a. Winter (Dec 1 to March 15): Five (5) lost workdays
 - b. Spring (March 16 to June 30): Three (3) lost workdays

- c. Summer (July 1 to August 31): One (1) lost workday
 - d. Fall (Sept 1 to Nov 30): One (1) lost workday
2. If the Contractor submits a weather delay claim for more workdays than those shown above, the Contractor shall submit records showing the dates and times on which workdays were lost due to weather conditions.
 3. Allowable lost workdays that are not used in a season will not carry over into the next season.
 4. For each workday lost due to weather that exceeds the seasonal limits specified above, submit documentation to the Engineer, within the time limits specified in General Conditions, Article 29. This documentation will include:
 - a. Arrival and departure times of Contractor and subcontractor personnel on each lost workday.
 - b. Demonstration that the weather posed a risk to safety, or caused outside work to be impractical or dangerous.
 - c. Photographs to document weather and site conditions.
 - d. Temperature, wind speeds, and amount and type of any precipitation.
 - e. The amount of total float on the paths of the work activities that could not be performed due to weather conditions.
 - f. A Time Impact Analysis (TIA) as specified herein.
- D. Time Impact Analysis
1. Submit a Time Impact Analysis (TIA) for all potential and actual changes to the schedule due to an event listed in General Conditions, Article 29, or in response to a request for proposal from the Engineer.
 2. Include a revised schedule fragment network analysis (fragnet) that demonstrates how the delay will be incorporated into the schedule. Show revised network logic and activity durations, and other supporting data requested by the Engineer.
 3. Submit a narrative report for the TIA, and the electronic .XER file for the schedule fragnet.
 4. If the Engineer accepts the extension of Contract Time, incorporate the fragnet into the next monthly schedule update after a Change Order for additional time and cost has been negotiated and executed.

END OF SECTION

SECTION 01380

CONSTRUCTION PHOTOGRAPHS

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. The Contractor to provide color audio-video taping of all construction areas prior to start of work and to take construction record photographs periodically during the Work as specified herein.
- B. Pre-construction videotaping is required of nearby structures, walkways, driveways, and buildings features within 200 feet of the construction area. The purpose of this video pre-construction survey is to establish a basis for existing conditions.

1.02 PHOTOGRAPHY REQUIRED

- A. Photographs taken in conformance with this Section shall be furnished to the Engineer with each pay request, or every month, if no pay request is initiated in a month.
- B. Provide photography shots of general area of the grounds and vicinity of work areas, prior to commencing any work on any property or roadway. Once work has begun, provide photographs at each of the major stages or events of construction related to work performed that month.
- C. Digital photographs may be taken by the Contractor's personnel but must be of professional quality. Photographs which are deemed unsatisfactory will be rejected and retakes will be required.
- D. Views and Quantities Required:
 - 1. Pre-existing condition of an area where work is to begin, up to a limit of five per month.
 - 2. Views of each activity, up to a limit of ten activities photographed per month.
- E. Digital Files:
 - 1. Provide Owner with copy of all digital photographs taken at project close-out.
 - 2. Each digital file shall be titled with structure and date.
 - 3. Digital files shall be in a common photographic format (png, jpg, or similar)
 - 4. Contractor shall submit to the Engineer the naming convention of the digital files submitted under this section.
- F. Costs of Photography: The Contractor shall include all costs for specified video-taping, photography, and prints in the lump sum bid price.

PART 2: PRODUCTS

2.01 PRINTS

A. Type of Print:

1. Paper: Single weight, full color print paper.
2. Finish: Smooth surface, matte finish.
3. Size: 8-inch x 10-inch for construction photos.

B. Identify each print on back, listing:

1. Name of project
2. Description and orientation of view
3. Date and time of photograph

PART 3: EXECUTION

3.01 VIEWS REQUIRED

A. Photograph from locations to adequately illustrate condition of construction and state of progress.

1. At successive periods of photography, take at least one photograph from the same overall view as previously photographed.
2. Consult with the Engineer at each period of photography for instructions concerning views required.

3.02 DELIVERY OF PRINTS

A. Deliver prints to the Engineer to accompany each Pay Estimate.

B. Distribution of construction prints as soon as processed is anticipated to be as follows:

1. Owner (two sets)
2. Engineer (one set)

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1: GENERAL

1.01 DESCRIPTION

- A. This section includes general requirements for the Contractor' Quality Control Plan, and it identifies the Contractor's responsibility for quality control inspections, tests, certificates and reports.
- B. The requirements of this Section apply to, and are a component of, each section of the specifications.

1.02 REFERENCES

- A. ASTM C1077 – Standard Practice for Laboratories Testing Concrete and Concrete Aggregate for Use in Construction and Criteria for Laboratory Evaluation.
- B. ASTM D3740 – Evaluation of agencies engaged in Testing and/or Inspection of soil and rock as used in engineering design and construction.
- C. ASTM E 329 – Evaluation of testing and inspection agencies as used in construction.

1.03 SUBMITTALS

- A. Comply with Section 01300 SUBMITTALS.
- B. Contractor's Quality Control (CQC) Plan
- C. Contractor's Weekly Quality Control Reports
- D. Safety and Fire Protection Plan
- E. Manufacturer's Service Reports

1.04 CONTRACTOR'S QUALITY CONTROL (CQC) PLAN

- A. Describe in detail the procedures, instruction, and reports that will be used to assure compliance with these Contract Documents. As a minimum, include the following:
 - 1. Description of the Contractor's quality control organization
 - a. Include an organizational chart showing responsibilities and lines of authority.
 - b. Describe authority of CQC staff to implement quality control for this project.
 - c. Identify person responsible for overall management of the project including both quality and production.

2. Identify the following for each person assigned QC responsibilities on this project:
 - a. Name
 - b. Qualifications (in resume format)
 - c. Project duties and responsibilities
 - d. Authorities
3. Provide a "Letter of Authorization" signed by an officer of the firm appointing the CQC manager for the project.
 - a. Describe CQC manager's specific responsibilities for this project.
 - b. Delegate sufficient authorities to the CQC manager to enable that person to perform the assigned duties.
 - c. Include the authority to "Stop Work" when it is not in compliance with the Contract Requirements.
4. Provide copies of "Letters of Direction" from the CQC manager to each of the various QC representatives outlining their individual duties and responsibilities.
5. Identify outside organizations that will assist the Contractor with implementation of the CQC plan. This should include consulting engineers, testing laboratories, architects, etc.
 - a. Provide the name and address of each organization.
 - b. Identify the specific services provided by each firm.
6. Identify each major subcontractor that will be used on the project.
 - a. Provide the name and address.
 - b. Describe the services to be provided.
7. Provide a detailed description of the procedures that will be followed to ensure that shop drawings, samples, product data, administrative submittals and similar items meet the Contract requirements.
 - a. Identify the name(s) of personnel authorized to review submittals.
 - b. Identify the name(s) of personnel authorized to certify for the Contractor that submittals meet with the Contract requirements.
8. Identify the following for each specification section
 - a. Personnel authorized to review submittals.
 - b. Personnel who will inspect Work provided.
 - c. Personnel or firms that will perform on-site, laboratory or factory testing.
9. Provide a detailed description of the procedures that will be used to document quality control operations, inspections, and testing. Include a copy of all forms and reports used for these purposes.
10. Provide a testing plan that addresses facilities, processes, equipment and material. Identify all tests required by these Contract Documents.

11. Develop and maintain a submittal status log for the duration of the project.
 - a. List all required submittals by Specification Section.
 - b. Identify actions required by the Contractor; the City, the City's consultant, and the City's project manager or designee.
 - c. Submit an updated log with each payment application.
- B. The City shall approve Contractor's CQC plan prior to the Contractor beginning work.
 1. Contractor may perform the following work prior to approval of the CQC plan:
 - a. Mobilization.
 - b. Surveying to locate Contractor's offices, laydown areas, and temporary utilities.
 - c. Selective demolition, as approved.
 - d. Installation of temporary utilities.
 2. Acceptance of the CQC plan shall be conditional, predicated upon satisfactory performance during the Work.
 3. City may require changes in the plan, including the replacement of QC personnel, in order to obtain the specified quality of Work.
 4. The Contractor shall notify the City in writing at least 7 days prior to changing the approved CQC plan. Such changes shall be subject to the approval of the City.

1.05 PRELIMINARY CQC MEETING

- A. CQC representative shall meet with the City's project manager or designee before Work begins and at least 5-days after submitting the revised CQC plan to discuss quality control requirements for the project and develop a mutual understanding of the Contractor's overall approach to quality control.
- B. Establish the following during the meeting:
 1. Schedule for future CQC meetings (bi-weekly, monthly, or as required by the City's project manager or designee).
 2. Procedures for submitting reports, records and other required documents.
- C. The CQC shall develop an agenda for each CQC meeting and distribute copies to the City's project manager or designee for review at least 5 calendar days prior to the meeting.
- D. The CQC representative shall develop minutes for each CQC meeting. Distribute copies to all in attendance within 5 calendar days of the meeting.

1.06 CONTRACTOR WEEKLY QUALITY CONTROL REPORT

- A. Content of Report
 1. Description of the work performed over 7 day period, beginning Sunday of every week.

- a. Provide location, and identify the personnel performing the work.
 2. Describe the trades working on the project.
 3. Identify the total number of personnel working of the project each day.
 - a. Designate personnel as Contractor employees or Subcontractor employee.
 - b. Identify the total number of men by craft.
 4. Describe the weather conditions each day and identify any weather delays encountered.
 5. List the major construction equipment used on the work each day. Separately identify all idle construction equipment.
 6. List instructions given and received each day.
 7. List all conflicts or discrepancies discovered on the Drawings or in the Specifications.
 8. Identify all test and quality control activities performed.
 - a. Reference the Drawing and Specification requirement.
 - b. List any deficiencies found and the corrective action taken.
 9. Describe job safety evaluations performed each day. Describe what was checked, the results, and any instructions or corrective actions taken.
 10. Identify submittals reviewed. Include the contract reference, identify the reviewer and describe the action taken.
 11. Discuss any off-site surveillance activities along with actions taken.
 12. Attach copies of test reports and quality control reports developed by subordinate QC personnel.
 13. Other information as appropriate, including delays, site visitors,
- B. Records
1. Factory test results
 2. Manufacturer's certifications
 3. Field test and laboratory results
 4. Documentation required elsewhere in these Contract Documents.

1.07 CQC RECORDS

- A. Maintain on-site in a central location
- B. Identify each record and ensure that it is traceable to a specific requirement cited on either the Drawings or in the Specifications.

1.08 PROTECTION OF PROPERTY

A. Existing Facilities

1. Protect existing surfaces and facilities from damage resulting from the Work unless the surfaces or facilities are being modified as part of this Contract.
2. Protect existing paving, landscaping and utilities from damage by mobile and stationary equipment; including vehicles delivering materials to the site.
3. Protect all finished surfaces from damage resulting from the Work. This includes the following:
 - a. Jambs.
 - b. Soffits.
 - c. Openings that are used as passageways for equipment or materials.
4. Protect adjacent structures from damage. Provide the following whenever required by law or necessary for safety:
 - a. Shoring
 - b. Bracing
 - c. Underpinning
 - d. Other measures necessary to protect those portions of adjacent structures that may be affected by the Work.

B. Utilities

1. Known utilities are shown on Drawings.
2. The locations of these utilities are not guaranteed, nor is there any guarantee that other utilities are not present.
3. Protect utilities from damage and cause no interruption of service.
4. Establish and maintain direct contact with owner of each utility that may be affected by Work, and proceed with Work that may affect a utility only with the cooperation and approval of the owner of the utility.
5. Before commencing construction, verify the location of utilities in vicinity of Work.
6. Prior to beginning construction affecting a utility, submit a plan for performing the Work to the City's project manager or designee for approval. Include evidence of approval by the utility owner.

C. New Work

1. Provide finished surfaces that are clean and unmarred. Refinish surfaces that have been inadequately protected and that are damaged.
2. Do not permit traffic or material storage on roof surfaces. Where such activity must take place on the roof in order to perform Work, ensure that there is adequate protection.

3. Remove snow and ice as may be required for the proper protection of Work.
4. Protect the Work against weather so as to prevent injury or damage to materials, equipment, apparatus, fixtures, or facilities.
5. Do not load or permit a structure to be loaded so as to endanger its safety.
6. Do not use items of equipment that are intended to form a part of completed Work as construction equipment without specific approval from City's project manager or designee in each instance.

D. Detection of Movement and Damage

1. Conduct a pre-construction inspection of existing facilities and structures in vicinity of Work.
 - a. Document inspection by photographs, video recordings, sketches, and narratives assembled into an inspection report.
 - b. Submit three (3) copies of the inspection report to the City's project manager or designee for approval.
 - c. Upon approval, the City's project manager or designee will sign and date the report and return one copy to the Contractor, indicating agreement that the report represents an accurate description of existing conditions.
2. Establish a system of reference points on or about structures that may be affected by excavation performed as part of Work.
 - a. Provide sufficient points to permit detection of both horizontal and vertical movement.
 - b. Accurately reference the points to a stable benchmark remote from the Work.
 - c. Survey the applicable reference points at least weekly whenever there is excavation in the vicinity.
3. Submit a movement detection plan for approval by the City's project manager or designee prior to beginning excavation.
4. Submit a copy of each movement detection survey within 24 hours after the survey is made.

E. Damage Repair

1. Repair damage to surfaces or facilities that are to remain in place as soon as possible after discovery.
2. Repairs shall result in conditions equal or greater in strength than the original conditions.
3. Make repaired surfaces identical in color and texture to adjacent existing materials. Where materials cannot be matched, refinish surrounding area to give a uniform appearance acceptable to City's project manager or designee.

4. Replace shrubs, cultivated vegetation, and trees damaged by the Work and not shown to be removed in kind.
 - a. Replace trees larger than 3 inches diameter, measured at a height of 3 feet above the ground swell, with trees of 3 inches in diameter.
 - b. Replace other vegetation with the same species and size as that damaged, unless otherwise approved by City's project manager or designee.

1.09 SAFETY AND FIRE PROTECTION

- A. Comply with Federal, State, and local safety and fire codes.
 1. Where there are conflicting requirements, the more stringent shall apply.
 2. The Contractor is advised that there is Hypochlorite, Caustic, Alum, Sodium Bisulfite and other hazardous chemicals on the project site.
- B. Safety and Fire Protection Plan:
 1. Submit a Safety and Fire Protection Plan for approval within 15 days of receiving "Notice to Proceed".
 2. Comply with the General Conditions and include all of the elements described herein.
 - a. Emergency response plans.
 - b. Identification of site access and evacuation routes.
 - c. Description of site security requirements.
 - d. Safety training.
 - e. Protection of the workmen.
 - f. Warning signs.
 - g. Traffic control.
 - h. Fire protection.
 - i. Noise and atmosphere monitoring.
 - j. Personnel protective devices and apparel
 - k. Performance of required inspection of fire protection equipment.
 - l. Scaffolding, hazardous materials, excavation, trenching, and shoring.
 - m. General site inspections.
 - n. Medical services.
 - o. Nearest medical facilities.
 - p. Reporting of accident injury and illness data.
 - q. Drinking water; toilets and sanitary facilities
 3. Provide the name, address, telephone number, and signature of Contractor's representatives who will be responsible for enforcing provisions of the plan.

4. Update and re-submit the plan periodically, as necessary, to include new requirements not included in the first submission.
- C. Record and immediately report to the City's project manager or designee (orally within 8 hours and in writing within 7 days), accidents resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, and equipment incident to Work.
- D. Fire Protection
1. The storage of flammable material on site shall be kept to a minimum. Such material that is on-site shall be properly handled and stored.
 - a. Store gasoline and other flammable liquids in Underwriters Laboratories listed safety containers in conformance with the National Board of Fire Underwriters recommendations.
 - b. Do not store flammable liquids in buildings.
 2. Except as otherwise provided, do not permit fires to be built or open salamanders to be used in Work.
 3. Comply with published standards of the National Fire Protection Association as they pertain to general construction practices such as cutting and welding.
 4. Provide a sufficient number of approved, non-freeze, portable fire extinguishers distributed throughout the project.
 5. Make arrangements for periodic inspection by local fire protection authorities and insurance underwriters.
 - a. Cooperate with authorities.
 - b. Promptly carry out their recommendations.

PART 2: PRODUCTS (NOT USED)

PART 3: EXECUTION

3.01 INSPECTIONS

A. General

1. The City, the City's project manager or designee, and others as stated in the General Conditions have the right to inspect all material and equipment at all stages of development or fabrication.
 - a. They shall be allowed unrestricted access to the site and to the Contractor's and Supplier's shops to conduct such inspections.
 - b. On-site work will be subjected to continual inspection.
 - c. Inspection by the City or others will not release the Contractor from responsibility or liability with respect to material or equipment.
 - d. The City's project manager or designee shall provide the Contractor a minimum of 24 hours notice prior to unscheduled offsite inspections.

- B. When local codes or laws require approval and inspection of the Work by other agencies or organizations before installation or operation, the Contractor shall obtain such approval and submit one signed original and three copies of the approval to the City's project manager or designee.
- C. Site Inspections
1. A Preparatory Inspection shall be performed prior to beginning each major segment of the Work, and it shall include:
 2. A review of each paragraph of applicable Specification Sections.
 3. A review of Drawings.
 4. A check to ensure the following:
 - a. That materials and equipment have been tested, if required,
 - b. That shop drawings, samples and similar items have been submitted, and approved.
 - c. That the portion of the CQC Plan for Work to be performed has been accepted by the City.
 5. Examination of the work area to ensure that all required preparatory Work has been completed and that the area is ready to receive the proposed Work.
 6. Examine required materials, equipment, and sample work to assure that they are on hand, and conform to approved submittals.
 7. Review appropriate activity hazards to ensure safety requirements are met.
 8. Identify testing requirements during construction.
 9. Meet with the CQC System Manager, the superintendent, other CQC personnel (as applicable), and the site foreman responsible for this aspect of the Work.
 10. Notify City's project manager or designee at least 48 hours in advance of beginning the Preparatory Inspection.
 11. Document results of the Preparatory Inspection actions by minutes prepared by CQC System Manager and attach to daily QC report.
- D. Daily Follow-up Inspections shall be accomplished to ensure continuing compliance with Contract requirements.
1. Continue until that particular feature of the Work is complete.
 2. Update CQC record documentation.
 3. Conduct final follow-up checks and correct deficiencies prior to start of additional features of Work which may be affected by defective Work. Do not build upon or conceal defective Work.
 4. Test facilities to demonstrate compliance with the Contract requirements.

E. Factory Inspections

1. Arrange and perform factory inspections as specified in the technical specifications.
2. Report inspections on CQC Daily Report.

F. Non-Compliance List:

1. The CQC Representative shall maintain a check-off list of Work that does not comply with the contract. State specifically:
 - a. What is non-complying,
 - b. Date defective Work was originally discovered, and
 - c. Date Work was corrected.
2. There is no requirement to report a deficiency, which was corrected the same day it is discovered.
3. Contractor shall not add to or build upon non-conforming Work unless, in the opinion of City's project manager or designee, correction can be made without disturbing continuing Work.
4. The CQC Representative shall deliver a copy of check-off list of non-complying work items to City's project manager or designee on a monthly basis.

G. Deliver a certificate to the City's project manager or designee signed by CQC Representative prior to final inspection and acceptance by the City's project manager or designee. Certify that:

1. Work has been inspected.
2. Work is complete and in compliance with Drawings and Specifications; except as specifically noted otherwise.

3.02 SHOP TESTS

- A. When a shop test of mechanical equipment is required before the equipment is shipped to the Contract site, provide the City's project manager or designee and the City's consultant with a minimum of ten working days written notice of the appropriate test date and time.
- B. Ensure that the test site is safe, accessible, dry, ventilated and well lighted.
- C. Do not proceed with the installation of such equipment until the required test results are approved by the City's consultant.

3.03 MATERIAL TESTING

- A. All required testing shall be provided by the Contractor.
- B. Use an independent commercial testing laboratory for all testing to demonstrate compliance with the Contract Documents.
 1. The laboratory shall have performed previous satisfactory work for the City, or be certified by the National Voluntary Laboratory Accreditation Program,

Telephone (301) 975-4016 or the Washington Area Council of Engineering Laboratories Inc. Telephone (301) 588-8668.

2. The independent testing agency performing inspections and tests specified in Division 16 of these Specifications shall be a member of the National Electrical Testing Association.
 3. Testing agency shall be approved by the City's project manager or designee prior to use.
- C. Tests provided by Owner shall be at the Owner's cost and shall be for the sole benefit of the Owner.
1. Owner will make test results available to Contractor.
 2. Testing to satisfy Contractor's internal Quality Control procedures shall be Contractor's responsibility.
- D. All quality control and quality assurance testing shall be provided by Contractor unless otherwise specified:
1. Concrete mixes and mix designs.
 2. Concrete strength
 3. Asphaltic concrete materials and mix designs.
 4. Embedment, fill and backfill materials.
 5. Other tests as specified elsewhere.
- E. The Contractor shall cooperate with the City's project manager or designee and laboratory testing representatives.
1. Provide at least 24 hours notice prior to when specified testing is required.
 2. Provide labor and materials, and necessary facilities at the site as required by the City's project manager or designee and the testing laboratory.

3.04 FIELD PERFORMANCE TESTING

- A. The Work shall be subjected to three formal tests; preliminary, pre-final, and start-up tests.
- B. Each formal test shall be identified on the Contractor's Construction Schedule.
1. Schedule each formal test at a time approved by the City's consultant and the City's project manager or designee.
 2. Conduct all tests in the presence of the City's consultant and the City's project manager or designee.
 3. Submit up-to-date Record Drawings and preliminary Operation and Maintenance Manuals prior to scheduling each test.
- C. Provide all required labor, materials, equipment, instruments, lubricants and incidentals necessary to perform the tests.

- D. Provide competent and experienced representatives of the equipment manufacturer to assist with equipment installation, testing and adjustments prior to and during testing.
- E. Correct all discrepancies and deficiencies observed during each test before proceeding to the next test.
 - 1. Re-schedule and re-perform tests of equipment and systems previously found deficient at no additional cost to the Owner.
 - 2. Schedule Operator Training/Instruction required by the Specifications between the Pre-final Test and the Final Test as approved by the City's project manager or designee.
- F. Refer to Section 01650 for detailed testing requirements.

3.05 FACILITY ACCEPTANCE

- A. Final completion shall occur when the following items have been successfully completed:
 - 1. All required testing.
 - 2. All punch list items have been corrected and checked by the City's project manager or designee.
 - 3. Demobilization, restoration work, final clean up and other incidental work.
 - 4. All Work defined in General Conditions for substantial and final completion.
 - 5. Contractor furnishes approved reproducible record drawings in accordance with Section 01300.
 - 6. Operations and Maintenance Manuals are re-submitted, if they were modified during any of the tests.
 - 7. Release of Surety.
 - 8. Maintenance Bond
 - 9. Certificate of Payment of All Contract Obligations
- B. A Certificate of Final Acceptance will be issued in when the above requirements have been satisfied.
- C. In cases where two testing phases are required, an Interim Acceptance Certificate shall be issued.
 - 1. This will allow the Owner to use all facilities while the Contractor completes construction.
 - 2. For interim acceptance, the contractor shall not be required to submit record drawings. All such record drawings shall be submitted at the end of final testing and acceptance.

3.06 REPORTS

- A. Certified Test Reports

1. Submit the following to the City’s project manager or designee for approval in sufficient time to receive such approval before delivery of materials.
 - a. Transcripts,
 - b. Certified test reports,
 - c. Certified copies of all test reports
2. Conduct testing in an approved independent laboratory or the manufacturer's laboratory, within one year prior to submitting the reports for approval.
3. Accompany transcripts of test reports with a notarized certificate from the manufacturer or supplier.
 - a. Certificate shall be signed by either an officer of the manufacturer or the manufacturer's plant manager.
 - b. Certify that the tested material meets the specified requirements and is of the same type, quality, manufacture and make as that specified.

B. Certificate of Compliance

1. When permitted by the City’s project manager or designee, the Contractor may submit a notarized Certificate of Compliance for approval in lieu of certain specified tests. The Certificate shall be in the form of a letter from the manufacturer; and it shall state the following:
 - a. Manufacturer has performed all required tests
 - b. Materials to be supplied meet all test requirements
 - c. Tests have been performed within one year of the submittal of the certificate.
 - d. Materials subjected to the tests are of the same type, quality, manufacture and make as those specified.
 - e. Include identification of the materials.
2. The certificate shall be signed by an officer of the manufacturer. Materials shall not be delivered until approval of certificate is received by the Contractor.

C. Manufacturer's Certificates of Proper Installation

1. Prior to Preliminary Tests, submit Manufacturer's Certificates of Proper Installation for the following items of equipment.

Section	Equipment
----	All Division 11 Equipment
13204	Polyethylene Storage Tanks
13205	Fiberglass Reinforced Plastic (FRP) Tanks
13620	Fire Detection and Alarm Systems
14300	Monorail Hoists
14550	Conveyor Systems

Section	Equipment
16186	Variable Frequency Drives
16480	Motor Control Centers
16621	Engine Generator Systems
16920	Instrumentation and Control Panels

2. State the following:
 - a. The equipment has been installed under either the continuous or periodic supervision of the manufacturer's authorized representative,
 - b. It has been adjusted and initially operated in the presence of the manufacturer's authorized representative,
 - c. It is operating in accordance with the specified requirements, to the manufacturer's satisfaction.
3. If a manufacturer's certificate is not required, confirm in writing to the City's project manager or designee prior to the Preliminary Testing that he has operated or has observed others operate the piece of equipment or system in all specified modes and through all cycles required.

END OF SECTION

MANUFACTURER’S CERTIFICATE OF PROPER INSTALLATION

OWNER: City of Canton, GA PROJECT: Canton WPCP Expansion to 6 MGD

EQPT/SYSTEM: _____

EQPT SERIAL NO.: _____

EQPT TAG NO.: _____

SPEC. SECTION: _____

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

(Check Applicable)

- Installed under either the continuous or periodic supervision of the Manufacturer’s authorized representative.
- Inspected, checked, adjusted, and initially operated in the presence of the Manufacturer’s representative.
- Serviced with proper initial lubricants.
- Electrical and mechanical connections meet quality and safety standards.
- All applicable safety equipment has been properly installed.
- System has been tested and meets or exceeds specified performance requirements to the Manufacturer’s satisfaction. (When complete system of one manufacturer)

Comments: _____

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

Date: _____, 20____

Manufacturer: _____

By Manufacturer’s Representative: _____
(Authorized Signature)

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SECTION 01410

TESTING LABORATORY SERVICES

PART 1: GENERAL

1.01 DESCRIPTION

- A. Testing laboratory inspection, sampling and testing is required for:
 - 1. Earthwork: Division 2 of these Specifications
 - 2. Concrete: Division 3 of these Specifications
 - 3. Piping: Division 15 of these Specifications
- B. Related Requirements in other parts of the project manual:
 - 1. Inspection and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities: conditions of the contract.
- C. Responsibility and payment for testing shall be as follows:
 - 1. Concrete testing laboratory will be selected by the Contractor and approved by the Owner.
 - 2. Contractor shall include the costs of all inspections, sampling and testing in their base. Sampling and testing beyond what is specified in these Contract Documents shall be covered through the allowance included in the Bid Form.
 - 3. All samples shall be taken in the presence of the Engineer. Where the test results indicate a failure to meet specified requirements, Contractor shall pay all costs associated with the failing tests. Use of allowance monies to cover the costs associated with failed tests is not allowed.

1.02 QUALIFICATIONS OF LABORATORY

- A. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.
- B. Meet basic requirements of ASTM E 329, "Standards of Recommended Practice for Inspection and Testing Agencies for concrete and steel as used in construction."
- C. Authorized to operate in the State in which the Project is located.

1.03 LABORATORY DUTIES

- A. Submit written reports of each test and inspection within 48 hours of testing. One copy each to the Engineer, Owner, Contractor, and one copy to Record Documents file. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing laboratory name, address and telephone number.

4. Name and signature of laboratory inspector.
 5. Date and time of sampling or inspection.
 6. Record of temperature and weather conditions.
 7. Date of test.
 8. Identification of product and specification section.
 9. Location of sample or test in the project.
 10. Type of inspection or test.
 11. Results of tests and compliance with contract documents.
 12. Interpretation of test as required by the Engineer or the Owner.
- B. Perform additional tests as required by the Engineer or the Owner.

1.04 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
1. Release, revoke, alter or enlarge on requirements of Contract Documents
 2. Approve or accept any portion of the work.
 3. Perform any duties of the contractor.

1.05 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel and provide access to work.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.
- D. Furnish copies of products test reports as required.
- E. Furnish incidental labor and facilities:
1. To provide access to work to be tested.
 2. To obtain and handle samples at the project site or at the source of the product to be tested.
 3. To facilitate inspections and tests.
 4. For storage and curing of test samples.
- F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

1. Contractor shall be responsible for the costs associated with laboratory personnel and travel expenses incurred due to Contractor's negligence and/or lack of proper scheduling.
- G. Employ and pay for the services of a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required:
1. For the Contractor's convenience.
 2. When initial tests indicate work does not comply with Contract Documents.

PART 2: (Not Used)

PART 3: (Not Used)

END OF SECTION

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SECTION 01510

TEMPORARY UTILITIES

PART 1: GENERAL

1.01 DESCRIPTION

- A. Furnish, install and maintain temporary utilities required for construction, remove on completion of work.
- B. Related Requirements specified in other sections:
 - 1. See Section 01010, Summary of Work

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with National Electric Code.
- B. Comply with Federal, State and local codes and regulations and with utility company requirements.

PART 2: PRODUCTS

2.01 MATERIALS, GENERAL

- A. Materials may be new or used but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

- A. As necessary, Contractor may use existing plant power at no cost. The Contractor shall not overload the power system and is responsible for ensuring that no overload occurs. The Contractor is responsible for temporary wiring and associated costs to provide service required for temporary power and lighting.
- B. Contractor to provide adequate artificial lighting for all areas of work when natural light is not adequate for work, and for areas accessible to the public.

2.03 TEMPORARY HEAT AND VENTILATION

- A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage due to temperature or humidity.
- B. Provide adequate forced ventilation for enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
- C. Portable heaters shall be standard approved units complete with controls.
- D. Pay all costs of installation, maintenance, operation and removal, and for fuel consumed.

2.04 TEMPORARY POTABLE WATER

- A. Arrange with the Owner to provide water for construction purposes. The Contractor is responsible for all temporary piping, backflow preventer(s) necessary and all cost associated for installation, maintenance and removal of the temporary water.

2.05 TEMPORARY SANITARY FACILITIES

- A. Provide sanitary facilities (restroom facilities) for the construction employees in compliance with laws and regulations.
- B. Service, clean and maintain facilities and enclosures.

2.06 EXISTING FACILITIES

- A. The existing facilities of the Owner shall not be used for construction purposes, or by construction personnel, including power, water, restrooms, and phone service. Construction personnel shall not enter buildings unless work is in progress at that time.

PART 3: EXECUTION

3.01 GENERAL

- A. Comply with applicable requirements specified in Division 15 – Mechanical, and in Division 16 – Electrical.
- B. Maintain and operate systems to assure continuous service.
- C. Modify and extend system as work progress requires.

3.02 REMOVAL

- A. Completely remove temporary materials and equipment when their use is no longer required.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities.

END OF SECTION

SECTION 01520

MAINTENANCE OF PLANT OPERATIONS

PART 1: GENERAL

1.01 SUMMARY

- A. The intent of this Specification is to have the Contractor schedule and perform the Work in a manner such that the Owner can keep the existing treatment plant facilities in continuous dependable operation and meet all regulatory requirements. See Section 01015 Sequence of Work.
- B. The Contractor shall:
 - 1. Perform all construction necessary to complete connections, tie-ins and shutdowns to existing facilities.
 - 2. Keep existing facilities in operation unless otherwise specifically permitted in these Specifications or approved by the Owner.
 - 3. Perform all construction activities to avoid interference with operations of the facility and the work of others.
 - 4. Start-up the new facilities in a controlled, systematic order as outlined in this Section.

1.02 GENERAL CONSTRAINTS

- A. Any temporary work, facilities, roads, walks, protection of existing structures, piping, blind flanges, valves, equipment, bypass pumping, line-stopping, etc. that may be required within the Contractor's work limits to maintain continuous and dependable plant operation shall be furnished by the Contractor at no extra cost to the Owner.
- B. The Contractor shall schedule the Work in such a manner so that the plant is maintained in continuous operation. All shutdowns shall be approved by the Owner. If, in the opinion of the Engineer, a shutdown is not required for the Contractor to perform the Work, the Contractor shall use alternate methods to accomplish the Work. All shutdowns shall be coordinated with and scheduled at times suitable to the Owner. Unless noted otherwise, the Contractor shall provide a minimum of 21-day notice of any system or partial system shutdown.
- C. Shutdowns shall not begin until all required materials are on-hand and ready for installation and the written shutdown plan has been approved by the Owner. At a time approved by the Owner, the shutdown period will commence and the Contractor shall proceed with the Work continuously, start to finish, until the Work is completed and the system is tested and ready for operation. If the Contractor completes all required Work before the specified shutdown period has ended, the Owner may immediately place the existing system back in service.
- D. The Owner shall have the authority to order the Work to be performed during a scheduled shutdown stopped or prohibit Work which would, in his opinion, unreasonably result in stopping the necessary functions of the plant operations.

The Owner reserves the right to cancel scheduled shutdowns if conditions warrant.

- E. All operations of existing equipment, valves and gates required for the Work shall be done by the Owner. Owner does not guarantee that valves, stop logs, gates, etc., are or will be 100 percent water or gas tight. Contractor shall provide, at no additional cost to the Owner, all temporary caps, plugs, dewatering, pumping and other measures required to perform the Work.
- F. Insofar as possible, all equipment shall be tested and in operating condition before the final tie-ins are made to connect new equipment to the existing facility.
- G. Contractor shall provide temporary lighting if shutdowns occur at night.
- H. Owner will require continuous access to all plant operational areas. Gates, roads and pathways required for vehicle and personnel access shall be maintained such that they are serviceable. If construction activities require interruption of normal access to any areas, the Contractor shall provide temporary means for the Owner access. Contractor shall coordinate access interruptions with the plant and provide at least 14-day notice of such interruptions. If vehicle support will be required in an area that is blocked by construction activity, the Contractor shall provide such access to the Owner upon request.

1.03 SUBMITTALS

- A. Submit detailed information for each shutdown. Submittal shall include detailed description of shutdown, shutdown time-line, detailed breakdown of work to be completed prior to and during shutdown, materials required and availability, proposed manpower, proposed method of protecting existing equipment, list of valves, gates and equipment that will require operation by the Owner and any other details to adequately describe the proposed shutdown.
- B. Submittal must be approved before shutdown can begin. Submit information at least 21 days prior to start of proposed shutdown.
- C. General Shutdown Requirements:
 - 1. One Pre-Shutdown Meeting shall be held prior to any shutdown. The meetings shall be conducted at least one week prior to the schedule shutdown and the day before the shutdown.
 - 2. Shutdown periods are indicated in 24-hour calendar days, months or number of hours.
 - 3. Simultaneous shutdowns of more than one facility, except as specifically indicated or allowed by the Owner, will not be permitted.
 - 4. Insofar as possible, all equipment to be incorporated into existing facilities shall be ready for installation before the existing facilities are shutdown.
 - 5. If the work during the shutdown periods is not done satisfactorily, or as planned, or within the time required or approved by the Engineer, the Owner may order the Contractor to work a 24-hour, 7-day week work schedule with a full crew, or he may order the Contractor to place the facility back in service and reschedule the shutdown or, he may order the work required to place the facility back in service done with other forces. If the work is done

by other forces, the Owner's costs will be deducted from the amounts due to the Contractor. In no case shall the Owner be required to make additional payment for overtime work or redoing the work caused by the Contractor's failure to complete the work in the allotted time.

6. Sediment control features, water disposal permits and other similar requirements shall be in place prior to starting any shutdown work.
7. If alternative shutdown procedures or methods to those indicated herein are proposed by the Contractor, they shall be submitted for approval. All supporting data, calculations and other information requested by the Engineer or the Owner shall be provided with the submittal.
8. If bypass pumping is necessary, the Contractor shall provide 100 percent back-up pump capacity available on-site.
9. Contractor shall be responsible for any cleanup resulting from spills during the bypass or tie-in operations.

END OF SECTION

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SECTION 01562

DUST CONTROL

PART 1: GENERAL

1.01 DESCRIPTION

Limit blowing dust caused by construction operations by applying water or employing other appropriate means or methods to maintain dust control.

1.02 PROTECTION OF ADJACENT PROPERTY

- A. The bidders shall visit the site and note the buildings, landscaping, roads, parking areas and other facilities near the work site that may be damaged by their operations. The Contractor shall make adequate provision to fully protect the surrounding area and will be held fully responsible for all damages resulting from his operations.
- B. Dust, Fumes, Spray, or Spills
 - 1. Protect all existing facilities (indoors or out) from damage by the above hazards (indoors or out):
 - 2. Protect motors, bearings, electrical gear, instrumentation, and building or other surfaces from dirt, dust, welding fumes, paint spray, spills or droppings causing wear, corrosion, malfunction, failure or defacement by enclosure, sprinkling or other dust palliatives, masking and covering, exhausting or containment.
- C. The Contractor shall be responsible for dust generated both on the construction site and on unpaved roads to the site. The Contractor shall provide the necessary controls to minimize dust generation from construction traffic on the unpaved areas used to access construction activities.

END OF SECTION

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SECTION 01600

DELIVERY, STORAGE AND HANDLING

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. This Section specifies the general requirements for the delivery handling, storage and protection for all items required in the construction of the work. Specific requirements, if any, are specified with the related item.
- B. Contractor shall note that portions of the site are in a flood plain. Materials stored in the flood plain shall be relocated if flooding is eminent or immediately upon notice of potential rising waters. Relocation of stored materials or Contractor's equipment due to flooding shall be at no cost to Owner.

1.02 TRANSPORTATION AND DELIVERY

- A. Transport and handle items in accordance with manufacturer's instructions.
- B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the Owner's Representative.
- C. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- D. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.
- E. All items delivered to the site shall be unloaded and placed in a manner that will not hamper the Contractor's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.
- F. Provide necessary equipment and personnel to unload all items delivered to the site.
- G. Promptly inspect shipment to assure that products comply with requirements, quantities are correct and items are undamaged. For items furnished by others (i.e. Owner, other Contractors), perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems.

1.03 STORAGE AND PROTECTION

- A. Store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instruction shall be studied by the Contractor and reviewed with the Engineer by him/her. Instruction shall be carefully followed and a written record of this kept by the Contractor. Arrange storage to permit access for inspection.

- B. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- C. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry always. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease and able to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in a manner to reduce breakage, cracking and spalling to a minimum.
- D. All mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) shall be stored in a weather-tight building to prevent injury. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Engineer. Building shall be provided with adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.
 - 1. All equipment shall be stored fully lubricated with oil, grease and other lubricants unless otherwise instructed by the manufacturer.
 - 2. Moving parts shall be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment, at least half load, once weekly for an adequate period to ensure that the equipment does not deteriorate from lack of use.
 - 3. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment at the time of acceptance.
 - 4. Prior to acceptance of the equipment, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum period. As such, the manufacturer will guaranty the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.
- E. All mechanical and electrical equipment and instruments stored outdoors shall be stored on pallets or bracing and elevated off the ground.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

SECTION 01640

MANUFACTURER'S SERVICES

PART 1: GENERAL

1.01 DESCRIPTION

- A. Provide the manufacturer's services required by these Contract Documents, including Manufacturer's Service as defined in the equipment specifications and or further defined herein.

1.02 INFORMATIONAL SUBMITTALS

A. Preliminary Training Plan

- 1. Comply with Section 01300 SUBMITTALS.
- 2. Submit at least thirty (30) days prior to training coordination meetings.

B. Final Training Plan

- 1. Submit within fourteen (14) days after training coordination meetings.

C. Training Materials

- 1. Submit written outlines for each training session with Preliminary Training Plan.
- 2. Furnish complete training materials, including operation and maintenance data.

D. Quality Control Submittals

- 1. Submit in accordance with Section 01400 QUALITY CONTROL.

E. Qualifications of Manufacturer's Representative

- 1. Submit in accordance with Section 01400 QUALITY CONTROL.

F. Manufacturer's Certification of Proper Installation

- 1. Submit in accordance with Section 01400 QUALITY CONTROL.

1.03 MINIMUM SERVICE REQUIREMENTS

A. Manufacturer's qualified representative shall conduct training.

- 1. Consider the time required to perform specified services in excess of that stated in the Specifications as incidental work.

B. Manufacturer's representative is subject to acceptance by OWNER and Engineer.

C. Schedule manufacturer's onsite services to avoid conflicts with others working onsite.

- D. Ensure that all conditions necessary to allow successful testing are met before scheduling services.
- E. Days of service must be approved by Engineer to fulfill the specified minimum services.
- F. Unless specified otherwise, manufacturer's onsite services shall include as a minimum:
 - 1. Installation assistance which includes observation, guidance, and instruction of the contractor's team during assembly, erection, and installation.
 - 2. Equipment inspection, checking, and adjustment.
 - a. Make equipment function as warranted by manufacturer
 - b. Manufacturer shall provide written approval of installation.
 - 3. Correct assembly, installation and operating problems.
 - a. Revisit the site as often as required.
 - b. Make acceptable to Engineer.
 - 4. Train OWNER personnel in the proper operation and maintenance of equipment.

1.04 TRAINING SCHEDULE

- A. Begin all training after Prefinal Testing and complete the training no less than seven (7) days prior to Startup Testing in accordance with Section 01650 FACILITY START-UP AND TESTING.
- B. List equipment and systems that require training and show:
 - 1. Estimated date to complete installation.
 - 2. Proposed training dates. Allow for multiple sessions as several shifts are involved.
- C. Adjust training schedule when deemed necessary by the OWNER to ensure training of appropriate personnel.
 - 1. Provide full participation by manufacturers' representatives.
 - 2. Adjust schedule for interruptions in operability of equipment.

1.05 TRAINING PLAN

- A. Preliminary Training Plan. Submit the following for each course:
 - 1. Title and objectives.
 - 2. Training schedule.
 - 3. Prerequisite training and experience of attendees.
 - 4. Recommended types of attendees (e.g., managers, engineers, operators, maintenance).

5. Course description and outline of course content.
 6. Duration.
 7. Location (e.g., training center of site).
 8. Format (e.g., lecture, self-study, demonstration, hands-on).
 9. Instruction materials and equipment requirements.
- B. Final Training Plan: Submit the following after training coordination meeting.
1. Updated versions of course descriptions from preliminary training plan.
 2. Updated recommended attendees for each course.
 3. Schedule of training courses, including: dates, durations, and locations of each class.
 4. Detailed course schedule for each day showing time allocated to each topic.
 5. Resumes of instructors providing the training.
 6. Training materials to be distributed at the time of training.

1.06 TRAINING OWNER'S PERSONNEL

- A. Provide experienced and competent personnel to conduct the specified training.
1. Personnel shall be familiar with the operation and maintenance manuals submitted in accordance with Section 01730 Operating and Maintenance Manuals.
 2. Provide both classroom and onsite, hands-on training to OWNER personnel.
 3. Address all aspects of operation and maintenance including systems, sub-systems, and components.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

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SECTION 01641

GENERAL EQUIPMENT STIPULATIONS

PART 1: GENERAL

1.01 SCOPE

- A. These General Equipments Stipulations apply, in general, to all equipment and piping. They supplement the detailed equipment specifications, but in case of conflict, the detailed equipment specifications shall govern.

1.02 COORDINATION

- A. The Contractor shall assume full responsibility for the coordination of the installation of all equipment, materials and products furnished under these Contract Documents. The Contractor shall be completely responsible for verification that all structures, piping and equipment components furnished by him and/or his Subcontractors and Suppliers are compatible. The Contractor shall start up each equipment system and shall make all necessary adjustments to place each system in proper operating condition.

1.03 ADAPTATION AND LOCATION OF EQUIPMENT

- A. Equipment shall be readily adaptable for installation and operation in the structures to be constructed under these Contracts. No responsibility for alteration of a planned structure to accommodate other types of equipment will be assumed by the Owner. Equipment, which requires alteration of the structures, will be considered only if the Contractor assumes all responsibility for making and coordinating all necessary alterations. All such alterations shall be made at the Contractor's expense.
- B. The Contractor shall install the work in such manner that the equipment, piping, vents, conduit, panels, ductwork, etc., be as neatly installed and out-of-the-way as physically possible. All equipment, piping, ductwork, conduit, etc., shall be installed to provide needed maintenance and passage space.

1.04 PATENT ROYALTIES

- A. All royalties and fees for patents covering materials, articles, apparatus, devices, or equipment shall be included in prices bid by the Contractor.

1.05 EQUIPMENT GUARANTEE

- A. The Contractor and equipment manufacturer shall guarantee all equipment against faulty or inadequate design, improper assembly or erection, defective materials, breakage or other failure. The guarantee period shall be defined in the section 01740 Warranties and Bonds.

1.06 WORKMANSHIP AND MATERIALS

- A. All equipment shall be designed, fabricated, and assembled in accordance with the best modern engineering and shop practice. Individual parts shall be manufactured to standard sizes and gauges so that repair parts, furnished at any

time, can be installed in the field. Like parts of duplicate units shall be interchangeable. Equipment shall be new and shall not have been in service at any time prior to delivery, except as required by tests. All bolts, nuts, fastening, pipe and fittings shall be manufactured in conformance with the United States system of measurement.

- B. Materials shall be suitable for service conditions. Iron castings shall be tough, close grained, gray iron free from blowholes, flaws, or excessive shrinkage and shall conform to ASTM A 48, Class 30 minimum. Plugging of defective castings shall not be permitted. Castings shall be annealed to remove internal stresses prior to machining and shall have the mark number and heat number cast on them.
- C. Except where otherwise specified, structural and miscellaneous fabricated steel used in items of equipment shall conform to the Standards of the American Institute of Steel Construction. All structural members shall be considered as subject to shock or vibratory loads.
- D. All replaceable or expendable elements such as filters, screens, drive belts, fuses, indicator lamps, etc., shall be easily accessible and replaceable without need of dismantling equipment or piping. All such items shall be of a standard type that is readily available from multiple suppliers.
- E. Threaded openings for drains or vents in pump volutes, compressor or fan scrolls, air receivers, and heat exchangers which are plugged during normal operation shall be provided with stainless steel plugs.

1.07 LUBRICATION AND LUBRICATION FITTINGS

- A. Equipment shall be adequately lubricated by systems, which require attention no more frequently than weekly during continuous operation. Lubrication systems shall not require attention during start-up or shutdown and shall not waste.
- B. Lubricants of the type recommended by the equipment manufacturer shall be provided in sufficient quality by the Contractor to fill all lubricant reservoirs and to replace all lubricants consumed during testing, start-up, and initial operation. The Contractor shall provide sufficient quantities of lubricants to lubricate all equipment for one year of normal service before final acceptance of the equipment will be made by the Owner.
- C. Where special run-in oil or storage lubricants are used, they shall be flushed out and replaced with the required service lubricant by the Contractor.
- D. Tag each piece of equipment with cloth tag showing proper type lubricant, period between lubrication, date of lubrication, and worker's initials. Have space for ten lubrication notations.
- E. Except for rotating shaft couplings, all lubrication fittings shall be brought to the outside of all equipment so that they are readily accessible from the outside without the necessity of removing covers, plates, housings, or guards. Fittings shall be accessible from safe, permanent platforms or portable high-pressure grease gun. Connection from a remote fitting to the point of use shall be with minimum 3/16-inch stainless steel tubing, securely mounted parallel to equipment and protected where exposed.

1.08 ELECTRIC MOTORS

- A. Unless otherwise required by the detailed equipment specifications or Division 16 specifications, motors furnished with equipment shall comply with the following:
1. Motors shall be designed and applied in compliance with NEMA, ANSI, IEEE and AFBMA standards and the NEC for the specific duty imposed by the driven equipment.
 2. Where frequent starting occurs, motors shall be designed for frequent starting duty equivalent to the duty service required by the driven equipment.
 3. All motors shall be rated for continuous duty at 40 degrees Celsius (°C) ambient. Motor temperature rise above 40 °C ambient on continuous operation at nameplate horsepower shall not exceed the NEMA limit for 1.0 service factor and Class B insulation, or Class A insulation if used.
 4. Motors shall be designed for full voltage starting. Motors operate under a ± 10 percent voltage variation and ± 5 percent frequency variation.
 5. Motor-bearing life shall be based upon the actual operating load conditions imposed by the driven equipment.
 6. Motors shall be sized for the altitude at the location where the equipment is to be installed.
 7. Motors shall be sized so that, under maximum continuous load imposed by the driven equipment, the motor nameplate horsepower for operation in 40 °C ambient is at least 15 percent more than driven load. Continuous equipment load shall not exceed 87 percent of motor nameplate horsepower, whether motor service factor is 1.0 or higher.
 8. Where the detailed specifications call for encapsulated motor windings, the motor shall have a sealed insulation system designed for a more severe environment than usual varnish treatments can withstand. The insulation system shall be General Electric "Polyseal", Allis-Chalmers" Poxeal", U.S. Motors "Everseal", or equal. Motors in this case may be single voltage rated.
 9. Motors shall have a clamp-type grounding terminal inside the motor conduit box.
 10. Motors with external conduit boxes shall have oversized conduit boxes.
- B. It is the intent of this general specification to allow the manufacturer's standard motor on integrally-constructed, motor-driven equipment such as appliances, hand tools, etc., that is specified by model number in which a redesign of the complete unit would be required for a motor with other features as may be specified herein.
- C. Unless otherwise required by the detailed equipment specifications, motors within the horsepower ranges indicated below shall be rated and constructed as follows:

1. Below ½ horsepower:
 - a. 115-volt, 60 hertz, single phase
 - b. Totally enclosed, fan cooled
 - c. Permanently lubricated, sealed bearings
 - d. Built-in manual-reset thermal protector: or furnished with integrally mounted stainless steel enclosed manual motor-overload switch
2. ½ to 1 horsepower:
 - a. 230/460-volt, 60 Hertz, 3-phase
 - b. Totally enclosed, fan cooled
 - c. Specially insulated for use in damp locations below 20 °C
 - d. Grease-lubricated, antifriction bearings
3. 1½ horsepower and above:
 - a. 230/460-volt, 60 Hertz, 3-phase
 - b. Totally enclosed, fan cooled
 - c. Specially insulated for use in damp location below 20 °C
 - d. Grease-lubricated antifriction bearings or oil-lubricated sleeve bearings
 - e. Vertical motors shall have 15-year average-life thrust bearings

1.09 DRIVE UNITS

- A. Except when specified otherwise in the detailed equipment specifications or Division 16 specifications, 87 percent of the nameplate horsepower rating of each drive motor shall be at least equal to the theoretical brake horsepower required to drive the equipment under full load, including all losses in speed reducers and power transmission.
- B. The nominal input horsepower rating of each gear or speed reducer shall be at least equal to the nameplate horsepower of the drive motor.
- C. Drive units shall be designed for 24-hour continuous service and shall be constructed so that oil leakage around shafts is precluded.
- D. GEAR MOTORS
 1. Gear Motors shall be rated AGMA Class II and shall bear an AGMA nameplate.
- E. GEAR REDUCERS
 1. Each gear reducer shall be totally enclosed, oil-lubricated, with antifriction bearings throughout. Worm gear reducers shall have a service factor of at least 1.25. Shaft-mounted gear reducers shall be rated AGMA Class II. Other helical, spiral bevel, and combination bevel-helical gear reducers shall have a service factor of at least 1.40. Each gear reducer shall bear an AGMA nameplate or the manufacturer shall certify that the gear reducer is designated and rated in accordance with AGMA standards.

F. CHAIN DRIVES

1. Chain drives shall utilize roller chain having an ultimate strength of not less than 10 times the maximum working loads.

G. V-BELT DRIVES

1. Each V-belt drive shall include a sliding base or other suitable tension adjustment. Fixed ratio V-belt drives shall have a service factor of at least 1.5 based on motor nameplate horsepower.

H. COUPLINGS

1. Couplings between motors drives or between drives and the driven equipment shall have a service factor of not less than 1.25 based on motor nameplate horsepower. Couplings between drives and the driven equipment shall have a service factor not less than that of the drive based on motor nameplate horsepower. All couplings rotating at speeds less than 900 rpm shall be of all steel construction. In general, couplings shall be of the tapered grid steel spring type or the crowned gear type.

I. OVERTORQUE PROTECTION

1. All low speed, high torque drives for equipment such as mechanical screens, conveyors, and clarifier and thickener mechanisms shall be protected against excessive torque by means of a suitable over torque protection device. Acceptable devices shall include torque switches, shear pins, shear keys and full-release torque couplings. Torque limiting couplings using sliding surfaces or friction to limit torque shall not be used.

1.10 SAFETY GUARDS

- A. All belt or chain drives, fan blades, couplings, and other moving or rotating parts shall be covered on all sides by a safety guard. Safety guards shall be fabricated from 16 USS gauge or heavier galvanized or aluminum-clad sheet steel or ½-inch mesh galvanized expanded metal. Each guard shall be designed for easy installation and removal. All necessary supports accessories shall be provided for each guard. Supports and accessories, including bolts, shall be galvanized. All safety guards in outdoor locations shall be designed to prevent the entrance of rain and dripping water. All safety guards shall comply with OSHA General Industry Standards, Part 1910, Subpart O, Machinery and Machine Guarding. Provide tachometer access on shaft ends. The safety guards shall be painted yellow in accordance with Section 09900, Painting.

1.11 ANCHOR BOLTS

- A. Equipment suppliers shall furnish suitable anchor bolts for each item of equipment. Anchor bolts, together with templates or setting drawings, shall be delivered sufficiently early to permit setting the anchor bolts when the structural concrete is placed. Two nuts and two washers shall be provided with sufficient threads to permit a nut and washer to be installed on the concrete side of the concrete form or supporting template, but in no case, shall bolts be threaded less than 2 (two) inches. Anchor bolts used in anchoring rotating or vibrating equipment shall be provided with suitable lock washers.

- B. Unless otherwise shown or specified, anchor bolts for items of equipment mounted on baseplates shall be long enough to permit a minimum of one (1) inch of grout beneath the baseplate and to provide adequate anchorage into structural concrete. Individual, embedded anchor bolts for heavy equipment shall be centered in a steel pipe sleeve having an inside diameter approximately two (2) times the bolt diameter and an embedded length approximately eight (8) times the bolt diameter.
- C. Bolts specified to be bent shall be bent cold. Bend radius shall not be less than twice the bolt diameter. Unless otherwise shown or specified, anchor bolts shall be embedded in concrete a minimum distance of fifteen (15) times the bolt diameter. Unless otherwise shown or specified, all anchor bolts shall be at least ½ inch diameter.
- D. All embedded anchor bolts or anchor bolt materials shall be ASTM A 193, Grade B8, ASTM A 276, Type 304, or IFI-104, Grade 304 stainless steel threaded per ANSI B1.1. Nuts shall be heavy hex nuts, ANSI B18.2, semi finished pattern, and shall be ASTM A 194, Grade 8 or IFI-104, Grade 304 stainless steel. Flat washers shall be 18-8 stainless steel and shall conform to ANSI B27.2
- E. Expansion anchors shall be used to anchor equipment to existing concrete. Expansion anchors shall be stainless steel, Type 304 and shall be of the wedge type for use in bottomless holes. Expansion anchors shall conform to the applicable requirements of Federal Specification FF-S-325. Installation methods shall be in conformance with the manufacturer's recommendations for maximum pullout and shear strength, but in no case, shall the depth of the hole be less than eight (8) bolt diameters or three (3) inches, whichever is greater. The minimum distance between the center of any expansion anchor and an edge or exterior corner of concrete shall not be less than five (5) times the diameter of the hole in which it is installed. The minimum distance between adjacent anchors shall not be less than ten (10) times the diameter of the hole in which it is installed.

1.12 EQUIPMENT BASES

- A. Where shown on the Drawings, equipment shall be installed on a raised reinforced concrete base. The base shall be a minimum of four (4) inches in height and shall extend beyond the equipment baseplate approximately two (2) inches on all sides.
- B. The electrical contractor shall be instructed concerning electrical conduit locations prior to pouring the concrete base.
- C. Unless otherwise specified, a cast iron or welded steel baseplate shall be provided for each pump, compressor, and any other item of equipment which is to be installed on a concrete base. Each unit and its drive assembly shall be supported on a single baseplate of neat design. Baseplates shall have pads for anchoring all components and adequate grout holes. Baseplates for pumps shall have a raised lip all around and a threaded drain connection. Baseplates shall be anchored to the concrete base with suitable anchor bolts and the space beneath filled with epoxy or non-shrink grout as specified in the grouting section.

- D. On direct-coupled equipment, motor and driven equipment shall be doweled to a common base with a minimum of two (2) dowels each.

1.13 ALIGNMENT OF MOTORS AND EQUIPMENT

- A. In every case where a drive motor is connected to a driven piece of equipment by a flexible coupling, the coupling halves shall be disconnected and the alignment between the motor and the equipment checked and corrected. Machinery shall first be properly aligned and leveled by means of steel wedges and shims or jacking screws near anchor bolts. Anchor bolts shall be tightened against the shims on wedges or jacking screws and the equipment shall again be checked for level and alignment before placing grout. Wedges shall not be placed between machined surfaces.
- B. In general, checking and correcting the alignment shall follow the procedures set up in the Standards of the Hydraulic Institute, Instructions for Installation, Operation, and Maintenance of Centrifugal Pumps. Equipment shall be properly leveled and brought into angular and parallel alignment.
- C. Equipment shall be installed in such a way that no strain is transmitted to the equipment by piping systems or adjacent equipment.

1.14 GROUTING

- A. A special epoxy, non-shrink grout shall be used in the placement of all pump, motor, and equipment baseplates or bedplates, column baseplates, other miscellaneous baseplates, and other grouting applications as shown on the Drawings. Grouting materials and installation shall be specified in the Section 03602 Non-Metallic Grout.

1.15 WELDING AND BRAZING

- A. All welds shall be sound and free from embedded scale and slag. All butt welds shall be continuous and where exposed to view shall be ground smooth. All continuous welds shall be gas and liquid tight. Welds in piping shall have full penetration and shall be smooth on the inside of the pipe. Intermittent welds shall have an effective length of at least two (2) inches and shall be spaced not more than six (6) inches apart.
- B. All welding of steel and aluminum, including materials, welding techniques, general safety practices, appearance and quality of welds, and methods of correcting defective work, shall conform to the latest requirements of AWS Specifications. Structural steel welding shall conform to the requirements of the AWS Structural Welding Code. The general recommendations and requirements of the AWS Structural Code shall also apply to welded aluminum structures. The welding process and welding operators must meet qualification tests and welding performance tests in accordance with the latest provisions of ASME Boiler and Pressure Vessel Code, Section IX, Welding and Brazing Qualifications. Welding process and qualification procedures for welding of pipe shall conform to the latest requirements of ANSI B31.1, Section 327, Welding, and Section 328, Brazing and Soldering. All welding qualification tests shall be witnessed by the Engineer, except as provided herein. All costs associated with the qualification or testing of welder and welding operators shall be borne by the Contractor.

- C. Actual welding procedures to be used in field assembly and installation of equipment furnished under this Contract shall be submitted to the Engineer for approval prior to beginning the work. Reports certifying that the welding procedures, welders and welding operators that the Contractor intends to use are qualified as specified above shall also be submitted to the Engineer prior to beginning the work. In case of welder qualifications for shop welding and for carbon steel field welding, welders presenting certified qualification papers validated within the preceding six (6) month period and acceptable to the Engineer will not be required to take the qualification tests. In case of field welding of stainless steel or aluminum, all welders shall be required to take the qualification tests regardless of experience or availability of certified qualification papers.
- D. Field welding practices shall conform to OSHA construction standards, Part 1926, Subpart J, Welding and Cutting. Shop welding practices shall conform to OSHA General Industry Standards, Part 1910, Subpart Q, Welding, Cutting, and Brazing.
- E. Welding electrodes for structural steel shall conform to the standard recommendations of the AISC. Welding electrodes for stainless steel shall conform to applicable AWS Specifications and shall be as recommended by "Welded Austenitic Chromium-Nickel Stainless Steel, Techniques and Properties". Published by the International Nickel Company, New York, New York. Welding electrodes for aluminum shall conform to applicable AWS Specifications.
- F. Each welder and welding operator must identify his/her welds with his/her assigned symbol.
- G. Welders performing unsatisfactory work shall be removed from the welding process.
- H. The Owner may inspect any weld by radiographic or other means. Welds not in accordance with the requirements specified herein shall be repaired or replaced at the Contractor's expense. Excessive porosity, nonmetallic inclusions, lack of fusion, incomplete penetration, and cracking shall constitute grounds for rejection of welds.

1.16 ERECTION AND SETTING

- A. In erection and setting of all fabricated equipment, the Contractor shall exercise care to ensure that each item of equipment is adequately supported so as not to bend or distort under its own weight until adequate foundation support and anchorage are provided. Where lifting lugs, angles or clips are provided on equipment, they shall be used in erecting and setting equipment. Erection and setting of equipment and structural steel shall conform to the requirements of OSHA Construction Standards, Part 1926, Subpart R, Steel Erection, Subpart H, Material Handling, Storage Use, and Disposal, and Subpart N, Cranes, Derricks, Hoists, and Conveyors. Erection of structural steel shall conform to the latest requirements of the AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings.
- B. During placement and prior to any grouting or connection of adjacent piping the equipment shall be leveled and aligned true to level, plumb, alignment, and grade

with all parts bearing or fitting the structure or equipment accurately and securely. It shall not be permitted to cock out of alignment, redrill, reshape or force fit any fabricated items.

- C. The Contractor shall take all measurements necessary to properly fit his work in the field, and he shall be governed by and responsible for these measurements and the proper working out of all details. The Contractor shall be responsible for the correct fitting of all work in the field and the accurate placement of all anchor bolts installed by him.
- D. The Contractor shall bring all parts to be erected or assembled into close contact. Before assembly, all surfaces to be in contact with other shall be thoroughly cleaned. Drift pins may be used only for bringing members into position, never to enlarge or distort holes. Torching or burning of holes or cutting of fabricated items to correct misalignment or shop errors shall not be permitted. Enlargement of holes necessary to make field connections shall be done only with the Engineer's approval by reaming with twist drills and in a manner acceptable to him.
- E. All equipment shall be furnished with suitable eyebolt lifting lugs or lifting angles to facilitate handling.

1.17 SPECIAL TOOLS

- A. Equipment requiring periodic repair and adjustment shall be furnished complete with special tools, instruments, and accessories required for proper maintenance. Special tools and accessories shall include those tools and accessories not normally available in an industrial hardware or mill supply house. Equipment requiring special devices for lifting or handling shall be furnished complete with those devices.

1.18 SHOP PRIMING AND PAINTING

- A. All equipment shop priming and painting, including surface preparation, workmanship and materials, shall be as specified in the Section 09900 Painting.

1.19 FIELD PRIMING

- A. All iron and carbon steel surfaces not specified to be galvanized or shop primed and all ferrous or nonferrous surfaces specified to be field primed and painted shall be coated in the field with one or more coats of primer in accordance with the requirements of the Section 09900 Painting.

1.20 FIELD PAINTING

- A. Except for interior surfaces of vessels and enclosed equipment not specified to be field painted, all ferrous and nonferrous surfaces of equipment which have received one or more coats of shop or field applied primer shall be field painted after installation in accordance with the requirements of the Section 09900 Painting.

1.21 GALVANIZING

- A. All galvanizing shall be done by the hot dip process after fabrication in conformity with the requirements of ASTM A 123, A 153, A 384 and A 385. articles to be galvanized shall be pickled before galvanizing.
- B. Where galvanizing bolts are specified or required by the Drawings, or zinc plated bolts will be acceptable.
- C. Areas of galvanizing damaged by welding or burning or otherwise damaged shall be thoroughly stripped and cleaned and recoated with zinc to the required thickness by the hot dip process.
- D. Galvanizing articles shall be free from uncoated spots, blisters, flux, black spots, dross, projections and other defects not consistent with acceptable galvanizing practice.
- E. Zinc plating shall be subject to visual examination to determine uniformity of coating.

1.22 PROTECTION AND STORAGE

- A. All equipment shall be boxed, crated or otherwise completely enclosed and protected during shipment, handling and storage. All equipment shall be protected from exposure to the elements and shall be kept thoroughly dry always. Pumps, motors, valves, control panels, instrumentation, electrical equipment, HVAC equipment and other equipment having antifriction or sleeve bearings shall be stored at a temperature of at least 60°F. Other equipment may be stored outside under cover. All equipment shall be stored above ground level and adequately supported on wood blocking or other approved support material. Printed storage instructions of the manufacturers shall be strictly adhered to.
- B. Painted, anodized or otherwise coated surfaces shall be protected against impact, abrasion, discoloration and other damage. All coated surfaces, which are damaged prior to acceptance of equipment, shall be cleaned and coated to the satisfaction of the Engineer with the same or equivalent coating used in the original application.
- C. Electrical equipment, motors, controls and instrumentation shall be protected against moisture or water damage. All space heaters provided in the equipment shall be kept connected and operating at all times until equipment is placed in service. Electrical equipment stored without space heaters shall be provided with desiccants to protect against moisture damage. Desiccant shall be silica gel porous bags at not less than one ounce per cubic foot of volume. Desiccant shall be replaced periodically.
- D. Electrical equipment and instrumentation shall be stored in a location that is free from excessive or injurious amounts of vibration.
- E. Rotating equipment such as pumps, motors, fans etc., shall be rotated periodically. In the absence of specific exercising instructions by the equipment manufacturer, each item of rotating equipment shall be rotated a minimum of ten (10) revolutions at intervals not to exceed twenty (20) days. When shafts are too difficult to rotate by hand, nonmetallic grips shall be used to turn the shafts.

- F. Interiors of gear and bearing cases housing oil-lubricated gears and bearings shall be filled with a rust inhibiting oil prior to storage or, if extended storage is anticipated, coated periodically with a rust inhibiting oil mist at intervals of time acceptable to the Engineer. Interiors of large pumps shall be protected using vapor phase inhibitor paper or porous bags of rust inhibiting, vapor emitting crystals. Exposed shafts shall be coated with rust preventative compound then wrapped with oil-impregnated paper and polyethylene film and sealed with waterproof tape prior to shipment.
- G. Individually packaged, unpainted steel parts shall be protected by a wrapping of vapor phase inhibiting or oil-impregnated paper and polyethylene film prior to shipment.
- H. Parts and equipment not requiring periodic inspection or maintenance shall be stored unopened in their original packaging until used.
- I. Parts, instruments, controls and small items of equipment shall be stored above ground or floor level on suitable shelves or racks in a heated, watertight warehouse.
- J. Flanged openings on equipment shall be covered with suitable solid wooden or metal blanks securely bolted to the flange using a minimum of four bolts and a suitable rubber gasket. Ends of threaded pipe and fittings shall be seated watertight with metal or plastic caps. Threaded openings shall be sealed watertight with metal or plastic plugs. Other openings shall be sealed with two layers of 6-mil polyethylene securely taped in place with waterproof tape.
- K. A maintenance log on each item of mechanical and electrical equipment requiring periodic attention in storage shall be maintained by the Contractor. Oil and grease changes, exercising, desiccant replacement, nitrogen purge checks, heater checks, insulation checks and other periodic maintenance shall be entered in the log. The maintenance log shall be made available to the Engineer on request.
- L. A resistance test shall be performed on all motor windings and heater elements following storage and prior to installation as a check for insulation deterioration or moisture damage during storage. Insulation tests shall be performed in accordance with the requirements of these Specifications.
- M. Immediately prior to installation, equipment shall be cleaned of any protective coatings used during storage and any rust, dirt, grit or other foreign material shall be removed.
- N. After installation and prior to start-up, all grease-lubricated joints, shaft couplings and bearings shall be flushed out and re-greased. All oil reservoirs and sumps shall be completely drained and flushed and re-filled with proper lubricant. Screens and filters shall be checked for contamination and replaced if necessary. The equipment shall then be tagged, signed and dated, indicating that the equipment has been properly lubricated for start-up.
- O. After storage, rubber parts such as valve seats, diaphragms, expansion joints, gaskets, hoses and shaft couplings shall be checked for hardening or cracking.

Deteriorated parts shall be replaced prior to start-up by the Contractor at his own expense.

1.23 VIBRATION TESTS

- A. Unless specified otherwise in the detailed equipment specifications, each pump, motor or similar item of stationary rotating equipment having a rated power more than 50 Hp or an operating speed in excess on 1,800 rpm shall be tested in the field for acceptable vibration levels. Vibration testing shall be performed by an experienced, factory-trained and authorized vibration analysis expert (not a sales representative) retained by the Contractor for this work. Each unit or pump system shall be tested separately without duplicate equipment running. All field-testing shall be done in the presence of the Engineer or the Owner's Representative. The Engineer shall be furnished with four (4) certified copies of vibration test data for each test performed.

1.24 PRESSURE AND TEMPERATURE GAUGES

- A. The Contractor shall furnish a compound pressure/vacuum gauge on the suction and a pressure gauge on the discharge of each pump, unless otherwise specified. Gauges shall be 4 to 5 inches in diameter with phenolic cases and clear shatterproof lenses. Gauges shall have a white background and black pointers and characters. Maximum scale reading shall be twice the maximum operating pressure of the fluid being measured. Accuracy shall be ± 2 percent. The operating mechanism shall be of the Bourbon type with positive protection against any solids contamination of the operating mechanism provided. Pressure gauges shall provide NPT connection and shall be isolated from piping by gauge cocks. Pressure gauges on rotary or reciprocating equipment shall be provided with pressure snubber.

1.25 LIMIT SWITCHES

- A. Unless otherwise specified, limit switches on equipment shall be of the heavy-duty, precision type with NEMA 4 steel enclosure and standard pretravel lever or plunger operator as required. Limit switches shall SPDT or DPDT contacts rated not less than five (5) amps inductive, ten (10) amps resistance at 120 volts AC. Limit switches in hazardous locations shall be enclosed in a cast aluminum, explosion-proof enclosure.
- B. Unless otherwise specified, pressure switches shall be of the snap-acting type with interval adjustment and shock-resistance, cast, waterproof enclosure. Contacts shall be SPDT or DPDT rated minimum fifteen (15) amps at 125 volts AC. Switch operation shall be by means of a Teflon diaphragm or Type 316 stainless steel bellows, depending on pressure range. All wetted parts shall be of brass or stainless steel. Switch shall have a repeatability of ± 1 percent of range or better. Switch shall be UL listed.
- C. Unless otherwise specified, temperature switches shall of the non-indicating, snap-acting type with internal adjustment, oil-filtered stainless-steel sensing bulb, and shock resistant, cast watertight enclosure. Contacts shall be SPDT or DPDT rated minimum fifteen (15) amps at 125 volts AC. Switches shall be furnished with a separate stainless steel well. Switch shall be UL listed.

1.26 INSTALLATION CHECK

- A. An experienced, competent, and authorized service representative of the manufacturer of each item of equipment or other person acceptable to the Engineer shall visit the site of the work and inspect, check, adjust if necessary, and approve the equipment installation. In each case, the equipment manufacturer's representative or other person authorized by the Engineer to perform the installation check shall be present when the equipment is placed in place in operation and shall revisit the jobsite as often as necessary until all trouble is corrected and the equipment installation and operation are satisfactory in the opinion of the Engineer.
- B. Each equipment manufacturer's representative or other person authorized by the Engineer to perform the installation check shall furnish to the Owner, through the Engineer, a written report certifying that the equipment (1) has been properly installed and lubricated; (2) is in accurate alignment; (3) is free from any undue stress imposed by connecting piping or anchor bolts; and (4) has been operated under full load conditions and that it operated satisfactorily. The work described under these Contract Documents will not be accepted as complete until satisfactory installation certifications have been submitted in accordance with the requirements of this Section and Section 01400 Quality Control.
- C. The Contractor shall properly coordinate the visits by the manufacturer's representatives, particularly where the operation of an item of equipment is dependent on the operation of the other equipment. Prior to calling the manufacturer's representative, the Contractor shall ensure that all necessary related equipment, structures, piping and electrical work is complete. The contractor shall pay for any revisits to the site by the manufacturer's representative made necessary due to the Contractor's failure to properly coordinate the visits.
- D. The Contractor shall inform the Engineer of any impending visits of manufacturer's representatives at least seventy-two (72) hours before the visits so that the Engineer can make arrangements to have his representative at the site to witness the installation check of the manufacturer's representative.
- E. The Contractor shall secure the services of the manufacturer's representative at the site of the work for as long as is necessary to check the installation and place the equipment in satisfactory operation.
- F. Electrical connections to equipment shall be made only upon approval of the manufacturer's representative.
- G. All costs for this work shall be included in the Contract Price(s) and no separate payment will be made.

1.27 FIELD TESTING

- A. After installation and checkout, all equipment shall be field-tested. During the field tests, the equipment shall be subjected to various full load and partial load conditions and emergency operating and shutdown conditions. The ability of the equipment to operate in the prescribed manner without overheating, jamming,

excessive noise or vibration or evidence of excessive wear shall be demonstrated to the satisfaction of the Engineer.

- B. All equipment shall be tested before it is covered or insulated. All accessory equipment, which may be damaged by conditions during the test shall be isolated or otherwise protected.
- C. Should results of the tests indicate that the equipment has failed to perform in accordance with requirements of the applicable detailed equipment specification, in the opinion of the Engineer, the Contractor shall make at his own expense such modifications or adjustments as required for satisfactory operation, including replacement of any or all components, if necessary. Following the modifications or adjustments, the Contractor shall repeat the field tests as specified herein. This procedure shall be repeated until results of the field tests indicate that the equipment has satisfied the requirements of the applicable section.
- D. The cost of all field-testing shall be included in the Contract Price(s) and no separate payment will be made.

1.28 IDENTIFICATION OF PIPING AND EQUIPMENT

All piping and equipment shall be identified as follows:

- A. All equipment and piping specified to be painted shall be color-coded. The colors shall be as specified in Section 09900 Painting. Insulated piping shall be identified using plastic bands, arrows and letters, colored and sized in accordance with Section 10140 Signage.
- B. All major items of equipment shall have an identification nameplate. The Contractor shall submit a suitable list of all items of major equipment to the Engineer, who will furnish the Contractor with an identification numbering system. The nameplates shall be of Type 304 stainless steel, No. 6 finish, and not less than No. 16 gauge with indented stamped lettering. Nameplates shall be attached to equipment bases easily visible and accessible locations. Nameplates shall be fastened in a permanent manner, arranged not to damage the equipment, with not less than four (4) stainless steel fasteners. All nameplates shall contain as a minimum the following information, where applicable:
 - 1. Name of equipment (from equipment specifications)
 - 2. Manufacturer
 - 3. Model designation
 - 4. Rated horsepower
 - 5. Service factor
 - 6. Electrical and insulation specifications
 - 7. Speed (rpm)
 - 8. Capacity and head (discharge pressure)

9. Net weight

Lettering shall be upper case, block style in size and spacing to suit the nameplate. A sample nameplate including fastenings shall be submitted to the Engineer for approval prior to manufacture of any of the nameplates. The identification nameplates shall not be painted.

- C. All manufacturer's nameplates, identification nameplates, and ASME code plates located on areas of equipment to be insulated shall be removed and reattached on uninsulated areas in a manner acceptable to the Owner.

1.29 WARNING SIGNS

- A. Unless specifically described elsewhere in these Contract Documents, permanent warning signs shall be furnished and installed on all mechanical and electrical equipment where a hazard exists as specified herein. Signs shall be made in accordance with OSHA requirements and shall be suitable for exterior use. Mounting details shall be in accordance with manufacturer's recommendations; location as approved by the Engineer. Fasteners shall be stainless steel.
- B. Warning signs shall be approximately ten (10) inches high by fourteen (14) inches wide, colored yellow and black, on minimum 0.080-inch aluminum stock.
- C. Warning signs shall be furnished as follows:
1. The following sign shall be affixed to all equipment which may be started automatically from a remote location:

**CAUTION
THIS EQUIPMENT MAY START
AUTOMATICALLY
BY REMOTE CONTROL**

2. The following sign shall be affixed to all electrical equipment or instrument panels, as applicable.

**CAUTION – SHOCK HAZARD
THIS EQUIPMENT IS POWERED BY MULTIPLE SOURCES.
CONTACTS MAY BE ENERGIZED AFTER LOCAL POWER
IS DISCONNECTED.**

3. The following sign shall be provided at all where oxygen or flammable materials are stored or used (colored red, white, and black):

**DANGER
NO SMOKING, MATCHES,
OR OPEN FLAMES.**

4. The following sign shall be affixed to all entrance hatches or access man-ways on covered tanks and vessels:

CAUTION
OXYGEN DEFICIENT OR TOXIC CONDITIONS MAY EXIST.
FOLLOW PRESCRIBED PROCEDURES BEFORE ENTRY.

5. The following sign shall be provided at all equipment blow-offs:

CAUTION
LOUD BLOWDOWN MAY OCCUR
WITHOUT WARNING.

PART 2: (Not Used)

PART 3: (Not Used)

END OF SECTION

SECTION 01650

FACILITY TESTING AND START-UP

PART 1: GENERAL

1.01 DESCRIPTION

- A. Perform a field-testing program for mechanical equipment, systems, processes, digital process control systems, and electrical facilities as specified herein.
- B. Refer to Division 16 for additional electrical system testing requirements.
- C. Refer to Section 16900 for additional testing requirements of the digital process control system.
- D. Refer to Section 01015 for sequence of work.

1.02 DEFINITIONS

- A. System – Integrated operating unit consisting of mechanical and electrical equipment, piping, valves, structures, controls, and instrumentation which operate together to perform a specific function. Mechanical systems are identified in Paragraph 1.02 of this Section. Electrical equipment, piping, valves, structures, controls and instrumentation are not specifically identified in Paragraph 1.02 of this Section but are necessary to make the mechanical equipment operate as a unit and are considered part of the system.
- B. Process Materials – Liquid or chemicals which are conveyed or treated by systems.
- C. Plant Water – Water from the existing plant water distribution system. This is treated effluent and is therefore non-potable water.
- D. Prerequisites – Items of work or submittals required prior to beginning each test.

1.03 TESTING REQUIREMENTS

- A. Start-up testing will be required for the following systems to verify the operation of the system as a whole. Start-up testing shall be performed as specified herein:
 - 1. Headworks – Vortex Grit Chamber
 - 2. Odor Control System
 - 3. Fine Screen Facility
 - 4. Biological Nutrient Removal
 - 5. Membrane Bioreactors
 - 6. UV Disinfection
 - 7. Post-aeration
 - 8. Waste Sludge Holding System

9. Drum Thickeners
 10. Aerobic Digester(s)
 11. Dewatering system
 12. Solids Drying system
 13. Chemical Addition
- B. Items to be tested in accordance with this Section are as follows:
1. Section 11000 – Miscellaneous Mechanical Equipment
 2. Section 11200 – Submersible Pumps
 3. Section 11202 – Slide Gates
 4. Section 11212 – Vertical Turbine Pumps
 5. Section 11220 – Compressed Air Mixing System
 6. Section 11231 – Chemical Metering Pumps
 7. Section 11237 – UV Disinfection Equipment
 8. Section 11270 – Parshall Flumes
 9. Section 11307 – Centrifugal Chopper Pumps
 10. Section 11311 – Horizontal Self-priming pumps
 11. Section 11312 – Horizontal End Suction Pumps
 12. Section 11315 – Progressive Cavity Pumps
 13. Section 11316 – Rotary Lobe Pumps
 14. Section 11318 – Grinder Pump Station
 15. Section 11321 – Vortex Grit Chamber
 16. Section 11331 – Fine Screens and Conveyor
 17. Section 11353 – Liquid Polymer Feed System
 18. Section 11370 – Sludge Dewatering System
 19. Section 11371 – Sludge Drying Equipment
 20. Section 11372 – Rotary Positive Displacement Blowers
 21. Section 11380 – Membrane Bioreactor System
 22. Section 11410 – Rotary Drum Thickeners
 23. Section 11440 – Diffused Aeration Equipment – BNR System
 24. Section 11441 – Diffused Aeration Equipment – Post Aeration
 25. Section 11442 – Diffused Aeration Equipment – Aerobic Digesters

26. Section 11450 – Residential Equipment
 27. Section 11500 – Odor Control System - Headworks
 28. Section 11501 – Odor Control System – Solids Handling Facility
 29. Section 11600 – Biosolids Storage Hopper
 30. Section 11610 – Shaftless Spiral Conveyor
 31. Division 16 – Electrical
- C. Testing Requirements for the following Sections shall be as provided as indicated in the respective Section:
1. Section 03300 – Cast in Place Concrete
 2. Division 15 – Mechanical
 3. Section 16011 – Protective Device Coordination Study
 4. Section 16125 – Fiber Optic Cable
 5. Section 16900 – General Control System Requirements

1.04 QUALITY ASSURANCE

- A. Equipment testing, training and startup shall be performed in accordance with individual equipment specification sections as follows:
1. Preliminary Test
 - a. The purpose of this phase of tests is to demonstrate that all of the equipment and systems when energized will perform the functions required by the Contract Documents, the approved Contractor's Drawings, and the preliminary approved Operation and Maintenance Manuals for each item of equipment or system. This phase of tests must demonstrate that the equipment or system has been properly installed, rotates when energized, sequences properly, and activates alarms, as required. Neither fluids nor process materials need to be utilized during this phase of testing, unless specified. The quality of workmanship and installation will be examined for deficiencies and logged in a punch list of items of work to be completed prior to the Prefinal Test. Specific tasks include (as applicable):
 - 1) Conduct adjustment, testing and calibration of all controls, switches, drives, and other instrumentation and control associated with the piece of equipment.
 - 2) Demonstrate that alignment and clearances are properly adjusted.
 - 3) Demonstrate that the equipment can be started, operated in all local modes, and stopped locally as required.
 - 4) Verify proper operation of hard-wired interlocks.
 - 5) Conduct Final Test of control system as specified in Section 16900.
 - b. Conduct additional testing required by the manufacturer to verify proper installation of the equipment.

- c. When local codes or laws require approval and inspection of the work by other agencies or organizations before installation or operation, such approval shall be obtained. Submit one signed original and three copies of the approval to the Engineer.
- d. Training of plant personnel for operation of individual equipment shall be conducted during this phase. Conduct training in accordance with the individual equipment specifications.
- e. In accordance with the Construction Schedule and with approval of the Engineer, schedule the Preliminary Tests a minimum of ten days before the Prefinal Tests are scheduled to begin.
- f. Tests to be provided by the Contractor and tests to be provided by an Independent Testing Company, shall be performed and recorded prior to the Preliminary Tests in order to avoid delays of the scheduled testing procedures.

2. Prefinal Test

- a. The purpose of this phase of tests is to demonstrate that all equipment and systems have been installed in accordance with the Contract Documents, approved Operations and Maintenance Manuals, and the Contractor's Drawings which have been approved; all integrated equipment and systems operate as complete units; all punch list items developed in the Preliminary Tests have been corrected and the results of this Test shall contribute toward a unanimous, satisfactory recommendation from the City Inspection, Operations, and Maintenance personnel that the system is ready for Start-up. Specific tasks include (as applicable):
 - 1) Demonstrate proper operation of the equipment in Local mode under actual or simulated operating conditions for a set period of time. Materials to be used are specified below. Any equipment malfunction during the test period must be corrected by the Contractor, and the test must be restarted.
 - 2) Simulate alarm conditions to demonstrate operation of hard-wired interlocks.
 - 3) Complete vibration testing as specified in Special Provisions and as specified herein.
 - 4) Check equipment for:
 - a) Overheating
 - b) Excessive noise
 - c) Overcurrent
 - 5) Confirm operation of Emergency Stop / Lockout where provided
 - 6) Demonstrate proper operation of automatic controls, as supplied by the manufacturer.
 - 7) Conduct Reliability Test on Controls System as specified in Section 16900.
 - 8) Perform Infrared Testing in accordance with Section 16010.

- C. For each test, submit detailed information regarding the method of obtaining non-potable water (NPW) if required for testing, method of disposing of NPW when testing is complete, and detailed information and drawings showing the location and size of temporary piping and/or pumping that may be required to circulate NPW.
- D. Submit the temporary bypass pumping plan if required for maintaining the continuous operation of the plant.
- E. Record Forms
 - 1. Test data record forms shall be provided for each system and item of equipment tested. Submit the form and format of the forms for approval. Completed test forms shall contain the following minimum identifications, data, and quality.
 - a. Project identification.
 - b. Test stage identification, Preliminary or Prefinal.
 - c. Sequence number of the test, i.e., First Test, Second Test, Final Test.
 - d. Date test was begun, and date when completed.
 - e. Identification of testing facility, e.g., Contractor, Independent Testing Co., Manufacturer.
 - f. All data shall be typewritten or neatly hand lettered, not long hand, and shall clear and bold to permit photocopying without loss of clarity.
 - g. Include on all test data record forms, or the Title Sheet of a multiple page test report the signature of the person conducting the tests or the chief person of a test team. Signatures shall be augmented by typewritten or hand-lettered facsimiles.

1.06 TEST MATERIALS AND EQUIPMENT

- A. The Contractor, Independent Testing company, and, where required, the manufacturers field service personnel are responsible for providing all test instruments, gauges, meters and auxiliary equipment. Test and calibrate all test equipment no more than 6 months prior to their use on this contract.
- B. Test data shall include ambient conditions as well as equipment/process performance data, including, but not necessarily limited to operating levels, pressures, temperatures, amperage and voltage. All final test data shall be included with the O&M manuals.
- C. The Contractor is responsible for obtaining NPW for testing and disposing of NPW following the completion of testing. Recommendations for obtaining NPW and establishing pumping loops are included in this Section.
- D. Utilize the temporary bypass pumps whenever temporary pumping is required for maintaining the continuous operation of the plant.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION

3.01 PREREQUISITE ACTIVITIES

- A. Unless specified otherwise, perform the following prerequisite items of work, prior to beginning Preliminary Tests:
1. Deliver preliminary Operations and Maintenance Manuals to the Engineer in accordance with Section 01730.
 2. Verify that there is no visible corrosion or mechanical damage to the equipment.
 3. Verify that name plates for equipment have correct legends.
 4. Verify that all mountings are secure and level, all piping attached, all belts and drives are installed and tensioned correctly, and all safety features are in place.
 5. Verify that all control and power circuits to the equipment are energized.
 6. Bump motors to verify correct rotation. Test motors in accordance with Division 16.
 7. Perform megger tests on all motors and electrical equipment.
 8. Perform appropriate testing as described in Division 16.
 9. Verify operation of seal water systems.
 10. Verify operation of valves.
 11. Inspect valves and verify proper open or shut positions
 12. Check all feed and drain lines.
 13. Verify that all equipment has been properly lubricated in accordance with manufacturer requirements.
 14. Other activities as specified in this Section.
- B. Unless specified otherwise, perform the following items of work prior to beginning Prefinal Tests:
1. Correct punchlist items from Preliminary Test.
 2. Deliver manufacturer's Certifications and Contractor Compliance Forms in accordance with Special Provisions.
 3. Deliver final, approved Operations and Maintenance Manuals to the Engineer in accordance with Section 01730.
 4. Perform appropriate testing in accordance with Section 16900.
 5. Other activities as specified in this Section.

- C. Unless specified otherwise, perform the following items of work prior to beginning the Start-up Tests:
1. Correct punchlist items from Prefinal Test.
 2. Verify that adequate chemicals and/or process liquids are in place for the respective equipment and systems.
 3. Verify that equipment, piping, tanks, sumps, or wet wells do not leak when filled with plant water. Leakage tests shall be performed in accordance with Sections 03300, 03400, 15200 and 15955.
 4. Complete all final testing required in Division 2 and Division 11 through 16.
 5. Other activities as specified in this Section and in Special Provisions.
 6. Complete all training activities required for each system, facility, and equipment.
 7. Verify that all Manufacturer's Certificates have been submitted and are included as part of all pertinent Operations and Maintenance Manuals, according to Section 01730.
 8. Make all necessary corrections to mechanical equipment to eliminate excessive vibration as defined in the Special Provisions.

3.02 START-UP TESTING

A. General

1. The Canton WPCP must be capable of treating incoming wastewater to meet the current NPDES discharge permit requirements at all times. Certain systems will be completed prior to others and will need to successfully proceed through start-up testing for the plant to continue operation. The sequence of testing will be dictated by the Contractor's construction schedule and use of temporary facilities such as bypass pumping and temporary power.
2. Separate start-up Testing will be required for the systems listed in Paragraph 1.03.A of this Section. Prefinal testing must be complete and approved by the Engineer for all equipment, piping, structures, and facilities associated with the systems identified in Paragraph 1.03.B prior to conducting Start-up testing. Additionally, all deficiencies must be corrected to the satisfaction of the Engineer and City prior to conducting Start-up testing.
3. Coordinate with City personnel during testing for operation of all existing valves and equipment.
4. Unless specifically noted, provide the necessary power, materials, water and chemicals for completion of the testing.
5. The start-up tests include coordinated operations of the facilities by the Contractor, City and the Manufacturers for equipment items and systems. Unless specifically noted, provide onsite qualified staff for the entire duration of the tests.

6. Test multiple and redundant equipment, tanks, process trains, pumps, etc. individually at each and every level of test.
- B. All equipment, piping, structures, and facilities associated with the systems identified above shall satisfactorily complete Prefinal testing. Correct all associated deficiencies before beginning Start-up testing.
- C. The Contractor is responsible for all labor, materials (liquids, chemicals, etc.), power, and utilities throughout the Start-up Test. During these tests, City personnel will operate all valves and equipment under the direction of the Contractor.
- D. The Start-up Tests include coordinated operations of the facilities by the Contractor, City, and the Manufacturers for equipment items and systems. Start-up Tests will only be completed after all required functional tests and those tests deemed necessary for the safe operation of the system have been completed. Provide onsite qualified staff for the entire duration of the tests.
- E. Test multiple and redundant equipment, tanks, process trains, pumps, etc. individually at each and every level of tests.
- F. The construction phasing plan and sequencing of work to complete the construction of the project while maintaining the plant operations during construction is provided in Section 01015. Based on the construction phasing, schedule and manufacturer's recommendations including system suppliers on preselected equipment, the contractor shall develop the final start up and commissioning plan for the for the following sub- systems as a whole after the preliminary and pre-final test were performed for each of the equipment listed in 1.03 B as described in 3.04 through 3.43:
 1. Headwork – Vortex Grit Chamber, Odor Control System, Fine Screen Facility
 2. Biological Nutrient Removal and Membrane Bioreactors system
 3. UV Disinfection and Post-aeration
 4. Chemical Addition System
 5. Solids Management System (Waste Holding System, Drum Thickeners, Aerobic Digesters, Dewatering system, Solids Drying system).
- G. The final start up plan and commissioning plan will be reviewed by the City and Engineer prior to the final start-up.

3.03 ACCEPTANCE OF THE WORK AND SPECIFIC TESTS

- A. The Engineer will grant written acceptance for each piece of equipment, system and process after successful completion of all testing and training, and the equipment, system or process must be put into service in order for the work to proceed. Once written acceptance is granted, the system will be turned over to the City for operation. In accordance with Special Provisions, Conditional Acceptance will be issued by the Engineer once the entire facility is operational and testing and startup of each individual component is complete. The Contract Guarantee period will not begin until Conditional Acceptance is granted for the entire facility. After Conditional Acceptance, the Contractor shall promptly complete any remaining clean-up operations and punch list items.

- B. Final Acceptance of the Work will occur as described in Section 01400.
- C. Specific Elements of Preliminary and Prefinal Tests
 - 1. The testing requirements that follow are specific performance criteria for Preliminary and Prefinal Testing.
 - 2. These testing requirements are in addition to the requirements given above and in the individual specification sections and are not all inclusive. Additional testing requirements may be requested by the City or manufacturer.
- D. Preliminary and prefinal testing is required for all the equipment listed in 1.03 B of this section. Conduct the preliminary and prefinal testing in accordance with the general and specific requirements set forth in this section.

3.04 VORTEX GRIT CHAMBER (SECTION 11321)

- A. Preliminary Test
 - 1. Conduct testing as specified in Paragraph 1.04.A.1 of this section.
 - 2. Alignment: Prior to facility startup, test complete assembly for proper rotation, proper alignment and connection.
- B. Prefinal Test
 - 1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
 - 2. Perform under actual or approved simulated operating conditions.
 - 3. Test for a continuous 3-hour period without malfunctions.
 - 4. Verify communications and system operation with the plant control system through the Ethernet communications. Coordinate the database with the system integrator for the project.

3.05 ODOR CONTROL SYSTEM - HEADWORKS (SECTION 11500)

- A. Preliminary Test
 - 1. Conduct testing as specified in Paragraph 1.04.A.1 of this section.
 - 2. Prior to startup, odor collection FRP air piping must be installed and tested.
 - 3. Verify operation of individual pieces of equipment.
- B. Prefinal Test
 - 1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
 - 2. Demonstrate that the equipment operates as intended under actual or approved simulated operating conditions, as specified in the technical specifications for said equipment.
 - 3. Verify communications and system operation with the plant control system through the Ethernet communications.

3.06 FINE SCREENS AND CONVEYOR (SECTION 11331)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this section.
2. Verify operation of individual pieces of equipment.
3. Verify operation of the non-potable water feed. Verify proper operation of alarms associated with the non-potable water feed system.

B. Prefinal Test

1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
2. Demonstrate the operation of the compactors, using NPW and un-dewatered screenings from the existing headworks, for a period of one hour without issue or malfunction.
3. Verify communications and system operation through the Ethernet system. Provide database for monitoring and control of point in the plant control system. Perform under actual or approved simulated operating conditions.

3.07 ROTARY POSITIVE DISPLACEMENT BLOWERS (SECTION 11372)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this section.
2. Operate each blower in local mode for 20 minutes

B. Prefinal Test

1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
2. Perform the functional test for operation of each blower as per the manufacturer's recommendation.
3. Operate each blower from plant control system for four hours. Use the clean water in the tanks being aerated.
4. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system. Provide all VFD parameters to system integrator.

3.08 DIFFUSED AERATION EQUIPMENT (SECTION 11440, 11441 AND 11442)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this section.
2. Coordinate with testing for rotary positive displacement blowers.
3. Test diffusers in each tank.
4. Operate diffusers for 30 minutes. Use clean water for testing. Provide two foot submergence for diffusers.
5. Test the diffusers grids for pressure and leakage.

B. Prefinal Test

1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
2. Operate diffusers for four hours. Use clean water for testing. Provide two foot submergence for diffusers.
3. Performance testing shall be performed for mixing, pressure and air distribution as required in the field testing as specified in the technical specification for said equipment.

3.09 HORIZONTAL SELF-PRIMING PUMPS (SECTION 11311)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. Operate pump in local mode for 2 minutes.
3. Run pump through three separate start/stop cycles.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Operate pump in local mode for 4 hours. Use clean water for testing.
3. Verify that equipment functions as part of a complete system as specified in the technical specification for said equipment.

3.10 COMPRESSED AIR MIXING SYSTEM (SECTION 11220)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this section.
2. Test the air piping and mixing system components for leakage.

B. Prefinal Test

1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
2. Performance testing shall be performed for mixing as required in the field testing in the equipment specifications.
3. Mixing system shall be operated for a continuous period of not less than 72 hours at the maximum water surface elevation in the basins.

3.11 MEMBRANE BIOREACTOR SYSTEM (SECTION 11380)

A. Membrane Bioreactor System was preselected and pre negotiated by the City through RFP (Request for Proposals) and included in this contract. The scope and responsibilities of the work for the selected supplier is provided in Specification Section 11380.

B. The contractor shall coordinate with the selected supplier and be responsible for complete installation and start up testing of the complete system including all of the individual components in accordance with the supplier's recommendations and requirements for the complete operational system.

- C. Functional and performance testing shall be performed as specified in the RFP and supplier's recommendations.

3.12 UV DISINFECTION EQUIPMENT (SECTION 11237)

A. Preliminary Test

1. Conduct in accordance with Paragraph 1.04.A.1 of this Section.
2. Verify with manufacturer that all equipment is properly installed and concrete work adjacent to the new UV modules is acceptable.
3. Verify that UV lamps can be removed and replaced according to Operations and Maintenance manuals without damaging the lamps or posing safety issues for plant operators.
4. Verify that UV lamps energize and de-energize according to local controls.
5. Verify that wiper system starts and stops according to local controls when placed in manual mode.

B. Prefinal Testing

1. Conduct in accordance with Paragraph 1.04.A.2 of this Section.
2. Ensure all punch list items have been addressed from Preliminary testing.
3. Establish temporary pumping loop to facilitate testing.
4. Perform the functional and performance testing as specified in the technical specification for said equipment and manufacturer's recommendations.
5. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.13 PARSHALL FLUMES (SECTION 11318)

A. Preliminary Test

1. Verify with manufacturer that flume is properly installed to their requirements.
2. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Demonstrate flow measurement system operates as intended as specified in the technical specifications for said equipment.
3. Verify communications with system integrator and plant control system for automatic monitoring level sensor and flow measurement via the plant control system.

3.14 VERTICAL TURBINE PUMPS (SECTION 11212)

A. Preliminary Test

1. Conduct in accordance with Paragraph 1.04.A.1 of this Section.

2. Establish temporary pumping loop to facilitate testing.
3. Run each pump independently as needed to demonstrate operation as described in Paragraph 1.04.A.1 of this Section. Run each pump for at least one (1) hour.

B. Prefinal Testing

1. Conduct in accordance with Paragraph 1.04.A.2 of this Section.
2. Conduct Prefinal Test while bypass pumping system is still in place.
3. Test each pump independently as needed to demonstrate operation as described in Paragraph 1.04.A.2 of this Section. Run each pump for at least four (4) hours without issue or malfunction.
4. Demonstrate variable speed operation by gradually introducing and removing flow from the pumping loop. Demonstrate that the pump properly increases and decreases speed as specified.

3.15 CHEMICAL METERING PUMPS (SECTION 11231)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. All pumping systems shall be pressure tested for leaks.
3. Demonstrate the equipment can be started, operated in all modes and stopped locally. Operate pump in local mode for 2 minutes.
4. Run pump through three separate start/stop cycles.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Perform the functional and performance testing as specified in the technical specification for said equipment.
3. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.16 HORIZONTAL END SUCTION PUMPS (SECTION 11312)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. Demonstrate the equipment can be started, operated in all modes and stopped locally. Operate pump in local mode for 2 minutes.
3. Run pump through three separate start/stop cycles.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.

2. Test each pump independently as needed to demonstrate operation as described in Paragraph 1.04.A.2 of this Section. Run each pump for at least four (4) hours without issue or malfunction.
3. Verify that equipment functions as part of a complete system as specified in the technical specifications for said equipment.
4. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.17 CENTRIFUGAL CHOPPER PUMPS (SECTION 11307)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. Demonstrate the equipment can be started, operated in all modes and stopped locally. Operate pump in local mode for 2 minutes.
3. Run pump through three separate start/stop cycles.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Test each pump independently as needed to demonstrate operation as described in Paragraph 1.04.A.2 of this Section. Run each pump for at least four (4) hours without issue or malfunction.
3. Verify that equipment functions as part of a complete system as specified in the technical specifications for said equipment.
4. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.18 GRINDER PUMP STATION (SECTION 11318)

A. Preliminary Test

1. Completed grinder pump stations shall be factory leak tested to assure the integrity of all joints, seams and penetrations.
2. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
3. Demonstrate the equipment can be started, operated in all modes and stopped locally. Operate pump in local mode for 1.5 minutes.
4. Run pump through three separate start/stop cycles.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Test each pump independently as needed to demonstrate operation as described in Paragraph 1.04.A.2 of this Section.
3. Verify that pump station functions as part of a complete system as specified in the technical specifications for said equipment.

3.19 SUBMERSIBLE PUMPS (SECTION 11200)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. Verify with manufacturer that all equipment is properly installed to their requirements.
3. Inspect all equipment to ensure proper alignment, noisy operation, proper connection, calibration of all instrumentation, and satisfactory operation of all equipment.
4. Demonstrate the equipment can be started, operated in all modes and stopped locally. Operate pump in local mode for 2 minutes.
5. Run pump through three separate start/stop cycles.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Demonstrate on each unit, under actual or approved simulated operating conditions, that the equipment operates as intended as specified in the technical specifications for said equipment. Run each pump for at least three (3) hours without issue or malfunction.
3. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.20 ROTARY DRUM THICKENER (SECTION 11410)

A. Preliminary Test

1. Conduct in accordance with Paragraph 1.04.A.1 of this Section.
2. Verify with manufacturer that all equipment is properly installed to their requirements.
3. Inspect all equipment to ensure proper alignment, noisy operation, proper connection, calibration of all instrumentation, and satisfactory operation of all equipment.
4. Verify electrical power and control panel operation.

B. Prefinal Testing

1. Conduct in accordance with Paragraph 1.04.A.2 of this Section.
2. Ensure all punch list items have been addressed from Preliminary testing.
3. Perform the functional and performance testing as specified in the technical specification for said equipment and manufacturer's recommendations.
4. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.21 ROTARY LOBE PUMPS (SECTION 11316)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. Verify with manufacturer that all equipment is properly installed to their requirements.
3. Inspect all equipment to ensure proper alignment, noisy operation, proper connection, calibration of all instrumentation, and satisfactory operation of all equipment.
4. Demonstrate the equipment can be started, operated in all modes and stopped locally. Operate pump in local mode for 2 minutes.
5. Run pump through three separate start/stop cycles.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Demonstrate on each unit, under actual or approved simulated operating conditions, that the equipment operates as intended as specified in the technical specifications for said equipment. Run each pump for at least four (4) hours without issue or malfunction.
3. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.22 SLUDGE DEWATERING SYSTEM (SECTION 11370)

A. Preliminary Test

1. Conduct in accordance with Paragraph 1.04.A.1 of this Section.
2. Verify with manufacturer that all equipment is properly installed to their requirements.
3. Inspect all equipment to ensure proper alignment, noisy operation, proper connection, calibration of all instrumentation, and satisfactory operation of all equipment.
4. Verify electrical power and control panel operation.

B. Prefinal Testing

1. Conduct in accordance with Paragraph 1.04.A.2 of this Section.
2. Ensure all punch list items have been addressed from Preliminary testing.
3. Perform the functional and performance testing as specified in the technical specification for said equipment and manufacturer's recommendations.
4. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.23 LIQUID POLYMER FEED SYSTEM (SECTION 11353)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. All pumping systems shall be pressure tested for leaks.
3. Demonstrate the equipment can be started, operated in all modes and stopped locally. Operate pump in local mode for 2 minutes.
4. Run pump through three separate start/stop cycles.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Demonstrate on each unit, under actual or approved simulated operating conditions, that the equipment operates as intended as specified in the technical specifications for said equipment.
3. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.24 PROGRESSIVE CAVITY PUMPS (SECTION 11315)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. Verify with manufacturer that all equipment is properly installed to their requirements.
3. Inspect all equipment to ensure proper alignment, noisy operation, proper connection, calibration of all instrumentation, and satisfactory operation of all equipment.

B. Prefinal Test

1. Perform testing as specified in Paragraph 1.04.A.2 of this Section.
2. Ensure all punch list items have been addressed from Preliminary testing.
3. Perform the functional and performance testing as specified in the technical specification for said equipment and manufacturer's recommendations.
4. Verify communications with system integrator and plant control system for automatic control and monitoring via the plant control system.

3.25 SLUDGE DRYING EQUIPMENT (SECTION 11371)

A. Sludge drying equipment system was preselected and pre negotiated by the City through RFP (Request for Proposals) to be included in the contract. The scope and responsibilities of the work for the selected supplier is provided in Specification Section 11371.

B. The contractor shall coordinate with the selected supplier and be responsible for complete installation and start up testing of the complete system including all of

the individual components in accordance with the supplier's recommendations and requirements for the complete operational system.

- C. Functional and performance testing shall be performed as specified in the RFP and supplier's recommendations.

3.26 SHAFTLESS SPIRAL CONVEYOR (SECTION 11610)

A. Preliminary Test

1. Conduct in accordance with Paragraph 1.04.A.1 of this Section.
2. Verify with manufacturer that all equipment is properly installed to their requirements.
3. Inspect all equipment to ensure proper alignment, noisy operation, proper connection, calibration of all instrumentation, and satisfactory operation of all equipment.
4. Verify electrical power and control panel operation.

B. Prefinal Testing

1. Conduct in accordance with Paragraph 1.04.A.2 of this Section.
2. Ensure all punch list items have been addressed from Preliminary testing.
3. Demonstrate on each unit, under actual or approved simulated operating conditions, that the equipment operates as intended as specified in the technical specifications for said equipment.

3.27 BIOSOLIDS STORAGE HOPPER (SECTION 11600)

A. Preliminary Test

1. Conduct in accordance with Paragraph 1.04.A.1 of this Section.
2. Verify with manufacturer that all equipment is properly installed to their requirements.
3. Verify hopper integrity through hydrostatic testing in the presence of the Owner or Owner's Representative.

B. Prefinal Testing

1. Conduct in accordance with Paragraph 1.04.A.2 of this Section.
2. Ensure all punch list items have been addressed from Preliminary testing.
3. Demonstrate on each unit, under actual or approved simulated operating conditions, that the equipment operates as intended as specified in the technical specifications for said equipment.

3.28 ODOR CONTROL SYSTEM – SOLIDS HANDLING FACILITY (SECTION 11501)

A. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this section.

2. Prior to startup, odor collection air piping must be installed and tested.
3. Verify with manufacturer that all equipment is properly installed to their requirements.
4. Verify operation of individual pieces of equipment.

B. Prefinal Test

1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
2. Perform the functional and performance testing as specified in the technical specification for said equipment and manufacturer's recommendations.
3. Verify communications and system operation with the plant control system through the Ethernet communications.

3.29 SLIDE GATES (SECTION 11202)

A. Preliminary Test

1. Conduct testing in accordance with Paragraph 1.04.A.1 of this Section.
2. Verify that the gates operate over their full range of travel.
3. Manually open and close each gate two times using the hand wheel.
4. Demonstrate that the hand wheel torque does not exceed specified limits under both seating and unseating conditions at specified heads.

B. Prefinal Test

1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
2. Test overload drives for trip torque.
3. Conduct leakage test on each gate in accordance with AWWA standards.

3.30 RESIDENTIAL EQUIPMENT (SECTION 11450)

- A. Start-up of residential equipment after service lines have been tested, balanced, and adjusted for pressure, voltage and similar consideration, and water lines have been cleaned and treated for sanitation.
- B. Test each item of operational equipment to demonstrate that it is operating properly, and that controls and safety devices are functioning. Run tests in the presence of the Engineer and the Owner's representative.

3.31 WIRE AND CABLES (600 VOLTS AND BELOW) (SECTION 16120)

A. Prerequisites

1. Inspect Each Individual Exposed No. 6 and Larger Power Cable for:
 - a. Physical damage.
 - b. Proper connections in accordance with single-line diagram.
 - c. Cable bends not in conformance with manufacturer's minimum allowable bending radius where applicable.

- d. Color coding in conformance with specifications.
 - e. Proper circuit identification.
2. Inspect Mechanical Connections for:
 - a. Proper lug type for conductor material.
 - b. Proper lug installation.
 - c. Bolt torque level in accordance with NETA ATS, Table 10.1, unless otherwise specified by manufacturer.
 3. Inspect Shielded Instrumentation Cables for:
 - a. Proper shield grounding.
 - b. Proper terminations.
 - c. Proper circuit identification.
 4. Inspect Control Cables for:
 - a. Proper termination.
 - b. Proper circuit identification.
 5. Inspect Cables Terminated Through Window Type CTs: Verify that neutrals and grounds are terminated for correct operation of protective devices.
- B. Preliminary Test
1. Conduct testing as specified in Paragraph 1. 4. A.1 of this Section.
 2. Insulation Resistance Tests:
 - a. Utilize 1,000 volt dc megohmmeter for 600 volt insulated conductors and 500 volt dc megohmmeter for 300 volt insulated conductors.
 - b. Test each conductor with respect to ground and to adjacent conductors per IEEE 118 procedures for one (1) minute.
 - c. Evaluate ohmic values by comparison with conductors of same length and type.
 - d. Investigate values less than 50 megohms. Any conductor with reading less than 5 megohms shall be replaced.
 - e. Continuity test by ohmmeter method to ensure proper cable connections.
- C. Prefinal Test
1. Conduct testing as specified in Paragraph 1. 4.A.2 of this Section.

3.32 CIRCUIT BREAKERS (BELOW 600 VOLTS) (SECTION 16155 AND 16160)

A. Performed by Contractor

1. Preliminary Test
 - a. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
 - b. Operate all circuit breakers to assure free operation.

2. Prefinal Test
 - a. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
 - B. Tests Performed By Independent Testing Company
 1. Prerequisites
 - a. Inspect all new low voltage circuit breakers 100 amperes and larger operating at 480 volts and below as follows:
 - 1) Operate circuit breaker to insure smooth operation.
 - 2) Inspect case for cracks or other defects.
 2. Preliminary Test
 - a. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
 - b. Perform the following tests on all new low voltage circuit breakers 100 amperes and larger operating at 480 volts and below:
 - 1) Contact resistance shall be measured. Contact resistance shall be compared to adjacent poles and to similar breakers. Deviations of more than 50 percent shall be not be permitted.
 - 2) Time-current characteristic tests shall be performed by passing 300 percent rated current through each pole separately. Trip time shall be determined. All trip times shall fall within manufacturer's time current curves for breaker tested.
 - 3) Instantaneous pickup current shall be determined by run-up or pulse method. Clearing times shall be within four (4) cycles or less. Instantaneous pickup current levels should be within 20 percent of manufacturer's published values.
 - 4) Insulation resistance shall be determined pole to pole, across pole and pole to ground. Test voltage shall be 1,000 volts D.C. Insulation resistance shall not be less than fifty (50) megohms.
 - c. Make voltage build-up tests on all equipment and wiring with a voltage sufficient to determine that no short circuits exist.
 3. Prefinal Test
 - a. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
- 3.33 SUPPLEMENTAL TESTS FOR VARIABLE FREQUENCY DRIVES (SECTION 16157)
- A. Prerequisites
 1. Verify that all push-to-test indicating lights are operational by manually initiating each.
 - B. Preliminary Test
 1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
 2. Proper electrical grounding connections.

3. Check selector switches.
 4. Verify manual adjustment of motor speed is operational.
 5. Verify adjustable speed system functions without motor load.
 6. Verify nonresettable run time indicator functions.
 7. Verify motor speed indicator is calibrated in Hertz and percent of rated rpm.
 8. Verify ammeter measuring drive output current is functional and calibrated.
 9. Verify in REMOTE position the motor runs in response to an external run command signal.
 10. Demonstrate orderly shutdown of system on loss of power.
 11. Demonstrate automatic restart of drive upon power restoration in normal sequence.
 12. Verify manual reset button for motor temperature detectors is functional and operates as specified.
 13. Demonstrate that all operator control devices mounted on the face of the controller function as specified.
 14. Fill pump wet well with clean water and run drive and motor through full speed range.
 15. Run drive for a 24-hour continuous period while demonstrating system performance by means of a draw-down test at a minimum of three speeds.
 16. Vibration Test (by City and Independent Test Co.)
 - a. The complete pumping assemblies consisting of the driving unit and pump, installed and in normal operation, and discharging to the connected piping systems at rates between the low discharge head and high discharge head conditions specified, and with the actual building structures and foundations provided, shall not develop at any frequency or in any plane, peak-to-peak vibration amplitudes exceeding 3 mils.
 - b. The vibration measurements shall be taken at the plane of the top motor bearing and the pump discharge head motor mounting base and at 90 degrees to each other.
- C. Prefinal Test
1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.
- D. Performance Test
1. Conduct on each controller.
 2. Perform under actual or approved simulated operating conditions.
 3. Test for continuous 12-hour period without malfunction.

4. Demonstrate performance by operating the continuous period while varying the application load, as the input conditions allow, to verify system performance.
5. Record test data for report.
6. With plant load connected to normal utility source, measure the following to show parameters within specified limits.
 - a. Total and individual current harmonic distortion (up to and including 35th harmonic) at incoming terminals of the associated drive switchboard (480V) under following load conditions:
 - 1) One VFD running at full load and half load.
 - 2) Half of the specified VFDs running at full load and half load.
 - 3) All of the specified VFDs running at full load and half load.
 - b. Power factor at input side of each drive. Documented verification that power factor maintained at 95 percent as speed of drive goes down from 100 percent to 33 percent.
7. In addition to above, demonstrate system performance for operating the pump and drive for a 24-hour continuous period while varying the application load as flow allows to verify system performance.

3.34 ELECTRIC MOTORS (SECTION 16220)

A. Prerequisites

1. Verify:
 - a. Proper electrical and grounding connections.
 - b. Shaft alignment.
 - c. Operate motor and check for:
 - 1) Excessive mechanical and electrical noise.
 - 2) Overheating.
 - 3) Correct rotation.
 - 4) Check vibration detectors, resistance temperature detectors, or motor inherent protectors for functionability and proper operation.
 - 5) Excessive vibration.
 - d. Check operation of space heaters.

B. Preliminary Test

1. Conduct testing as specified in Paragraph 1.04.A.1 of this Section.
2. Insulation Resistance Tests (by Motor manufacturer)
 - a. In accordance with IEEE 43 at test voltages established by NETA ATS, Table 10.2 for:
 - 1) Motors 200 hp and less for one (1) minute duration with resistances tabulated at 30 and 60 seconds.

- b. Insulation resistance values equal to, or greater than, ohm values established by manufacturers.
3. Calculate polarization index ratios for motors greater than or equal to 200 hp. Investigate index ratios less than 1.5 for Class A insulation and 2.0 for Class B insulation.
4. Insulation resistance test on insulated bearings in accordance with manufacturer's instructions.
5. Measure running current and voltage, and evaluate relative to load conditions and nameplate full-load amperes.
6. Complete all punch list items on motors.

C. Prefinal Test

1. Conduct testing as specified in Paragraph 1.04.A.2 of this Section.

3.35 DRY TYPE TRANSFORMERS (SECTION 16460)

A. Preliminary Test

1. As specified in Paragraph 1.04.A.1 of this Section.
2. Measure insulation resistance of transformer windings and busses. Take measurements before external connections to high and low voltage transformers bushings are completed.
3. Verify transformer ratings on tap positions for transformers. Set tap changer on transformers on positions required to give desired secondary operating voltage.
4. Adjust transformer taps so that average operating voltages at terminals of utilizing equipment shall match nameplate voltage of that equipment as closely as possible. The objective shall be to maintain equipment terminal voltage at less than 10 percent above nameplate rating at no-load and less than 5 percent below nameplate rating at full-load.

B. Prefinal Test

1. As specified in Paragraph 1.04.A.2 of this Section.

3.36 SWITCHGEAR (SECTION 16165)

A. Prerequisites

1. Compare equipment nameplate information with single-line diagram.
2. Check for proper anchorage and required area clearances.
3. Verify that fuse sizes and types correspond to drawings.
4. Perform mechanical operator tests in accordance with manufacturer's instructions.
5. Check blade alignment and arc interrupter operation.

6. Verify that expulsion limiting devices are in place on all holders having expulsion-type elements.
7. Check each fuse holder for adequate mechanical support for each fuse.
8. Inspect all bus connections for tightness of bolted bus joints by using calibrated torque wrench. Refer to manufacturer's instructions or Table 10.1 for proper torque levels.
9. Test all electrical and mechanical interlock systems for proper operation and sequencing.
10. Clean entire switch using approved methods and materials.
11. Verify proper phase barrier materials and installation.
12. Lubricate as required.
13. Check switch blade clearances with manufacturer's published data.
14. Inspect all indicating devices for proper operation.

B. Preliminary Test

1. As specified in Paragraph 1.04.A.1 of this Section.
2. Perform insulation-resistance tests on each pole, phase-to-phase and phase-to-ground, for one (1) minute. Minimum test voltage shall be 15 kV DC.
3. Perform AC over potential test on each pole with switch closed. Test each pole-to-ground with other poles grounded for one (1) minute at 60 kV AC or manufacturer's recommended values, which ever is greater.
4. Perform contact-resistance test across each switch blade and fuse holder.

C. Prefinal Test

1. As specified in Paragraph 1.04.A.2 of this Section.
2. Verify operation of interlocks, controls and switches.

3.37 POWER SYSTEM STUDY AND TESTING (SECTION 16011)

A. Tests shall be performed by Independent Testing Company.

B. Prerequisites

1. Inspect relays for physical damage and compliance with manufacturer's specifications.
2. Inspect cover gasket, cover glass, presence of foreign material, moisture, condition of spiral spring, disc clearance, rust and contacts.
3. Check mechanically for freedom of movement, proper travel and alignment, and tightness of mounting hardware and tap screws.
4. All settings shall be adjusted in accordance with Short Circuit and Coordination Study.

C. Preliminary Test

1. As specified in Paragraph 1.04.A.1 of this Section.
2. Perform insulation resistance test on each circuit branch to frame.
3. Perform following tests on settings as adjusted per Short Circuit and Coordination Study:
 - a. Pick-up parameters on each operating element.
 - b. Timing test shall be performed at three (3) points on time dial curve.
 - c. Pick-up target and seal in units.
 - d. Special tests as required to check operation of restraint, directional and other elements per manufacturer's instruction manual.
 - e. Perform phase angle and magnitude contribution tests on all differential and directional type relays after energization to vectorially prove proper polarity and connection.

D. Prefinal Tests

1. As specified in Paragraph 1.04.A.2 of this Section.

3.38 GROUNDING SYSTEM (SECTION 16450)

A. Prerequisites

1. Inspect exposed Connections for:
 - a. Proper lug type for conductor material.
 - b. Proper lug installation.
 - c. Proper Exothermic welds installation.
2. Before underground or embedded connections are covered, they shall be physically inspected to insure tightness and continuity.

B. Preliminary Test

1. As specified in Paragraph 1.04.A.1 of this Section.
2. After installation is complete, measure and record resistance between building grounding system and earth. Grounding system to earth resistance shall measure less than 5-ohms for 600 volt systems. For OSS No. 1 and No. 4 electrical. Medium Voltage Outdoor Switchgear substation grounds, the ground resistance shall be no greater than one five (15) ohm.
3. Measurements shall be made with a vibro ground or ground megger, using three probe method.

C. Prefinal Test

1. As specified in Paragraph 1.04.A.2 of this Section.

3.39 MOTOR CONTROL CENTERS (SECTION 16155)

A. Prerequisites

1. Verify that all push-to-test indicating lights are operational by manually initiating each.

B. Preliminary Test by Independent Testing Company

1. As specified in Paragraph 1.04.A.1 of this Section.
2. All breakers 460V and above rated 100 amperes and above shall be current-tested as specified above.
3. All thermal overload heaters shall be current tested by primary injection.
4. Check equipment grounding.
5. Check all connections.
6. Field megger breakers and bus.
7. Check polarity on CTs and PTs.
8. Check for level.
9. Check all door alignments.
10. Adjust the trip settings of all motor starter magnetic only circuit breakers to approximately 11 times full load current.
11. All protective devices shall be set according to the short circuit coordination study.
12. All protective devices shall be inspected, adjusted, tested and calibrated.
13. Manually and electrically close each relay's contact and verify that the circuit breaker closes.
14. Check that each overload reset arm is properly installed and aligned.
15. Calibrate all power transducers for proper output. Record full scale output in engineering units.
16. Record nameplate date and check for accuracy.
17. Check that all remove signals are received.
18. Check that all outputs to remote devices are functional.
19. Complete thermography of motor control centers. Tested components shall have run a minimum of 1 hour prior to thermography. Corrected and re-thermographed noted deficiencies.
20. Complete all punch list items on motor control centers and appurtenances.

C. Prefinal Test

1. Verify all punch list items have been corrected.

3.40 LIGHTING (SECTION 16500)

A. Preliminary Test

1. As specified in Paragraph 1.04.A.1 of this Section.
2. All Buildings and Structures
 - a. Verify lighting is functional and as shown on the Drawings.
 - b. Verify lighting panels are identified and lighting circuits identified within the panels.
 - c. Verify emergency lighting.
3. Site Lighting
 - a. Verify relocated lighting and new lighting are functional and as shown on the Drawings.
 - b. Verify lighting panels are identified and lighting circuits identified in the panels.

B. Prefinal Test

1. As specified in Paragraph 1.04.A.2 of this Section.

3.41 INSTRUMENT TRANSFORMERS (SECTIONS 16155)

A. Prerequisites

1. Verify correct connection of transformers with system requirements.
2. Verify that adequate clearances exist between primary and secondary circuit wiring.
3. Inspect all bolted electrical conditions, verify tightness of accessible bolted electrical connections.
4. Verify that all required grounding and shorting connections provide contact.
5. Verify correct primary and secondary fuse sizes for potential transformers.
6. Verify correct current and voltage ratings and ratios.

B. Preliminary Test

1. As specified in Paragraph 1.04.A.1 of this Section.
2. Current Transformers
 - a. Perform insulation resistance test of the current transformer and winding-to-ground at 1,000 volts DC.
 - b. Perform a polarity test of each current transformer.
 - c. Perform a ratio-verification test.
3. Voltage Transformers
 - a. Perform insulation resistance test winding-to-winding and each winding-to-ground with test voltage in accordance with Table below:

Transformer Insulation Resistance Test Voltages	
Transformer Winding Rated Voltage	Minimum DC Test Voltage
0 – 600	1000
601 – 5000	2500
> - 5000	5000

- b. Perform polarity test on each transformer to verify the polarity marks or H1-X1 relationship as applicable.
- c. Perform a turns ratio test on all tap positions.

C. Prefinal Test

1. As specified in Paragraph 1.04.A.2 of this Section.

3.42 MICROPROCESSOR BASED RELAYS (SECTIONS 16155)

A. Prerequisites

1. Inspect relays for physical damage.
2. Check all case connections for tightness. Inspect shorting hardware and knife switches.
3. Set relays in accordance with coordination study.
4. Verify correct CT and VT ratios.

B. Preliminary Test

1. As specified in Paragraph 1.04.A.1 of this Section.
2. Verify the proper operation of each protective device.

C. Prefinal Test

1. As specified in Paragraph 1.04.A.2 of this Section.

3.43 METERING (SECTIONS 16155)

A. Preliminary Test

1. As specified in Paragraph 1.04.A.1 of this Section.
2. Tighten case connections. Inspect shorting hardware and knife switches.
3. Set meters in accordance with GE Multilin's requirements.
4. Verify correct VT and CT ratios and connections.

B. Prefinal Test

1. As specified in Paragraph 1.04.A.2 of this Section.

END OF SECTION

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SECTION 01700

CONTRACT CLOSEOUT

PART 1: GENERAL

1.01 GENERAL

- A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.
- B. See Section 01041 for site cleaning activities required for Project Closeout.
- C. Related requirements in other parts of the contract documents.
 - 1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the Contract.
- D. Related requirements specified in other sections:
 - 1. Section 01041 – Coordination of Work
 - 2. Section 01730 – Operating and Maintenance Manuals
 - 3. Section 01731 – As-Built Drawings

1.02 SUBSTANTIAL COMPLETION

- A. When Contractor considers the work is substantially complete, submit to Engineer:
 - 1. A written notice that the work or designated portion thereof is substantially complete.
 - 2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, the Engineer will make a construction review to determine the status of completion.
- C. Should Engineer determine that the work is not substantially complete:
 - 1. Engineer will promptly notify the Contractor in writing giving the reasons therefore.
 - 2. Contractor to remedy the deficiencies in the work, and send a second written notice of substantial completion to the Engineer.
 - 3. Engineer will again review the work for completion status.
- D. When the Engineer finds that the work is substantially complete, he will:
 - 1. Prepare and deliver to Owner a tentative certificate of Substantial Completion with a tentative list of items to be completed or corrected before final payment.
 - 2. After consideration of any objections made by the Owner as provided in conditions of the contract, and when Engineer considers the work substantially complete, he will execute and deliver to the Owner and the Contractor a

definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

1.03 FINAL CONSTRUCTION REVIEW

- A. When Contractor considers the work is complete, he shall submit written certification that:
 - 1. Contract documents have been reviewed.
 - 2. Work has been reviewed for substantial compliance with contract documents.
 - 3. Work has been completed generally in accordance with contract documents.
 - 4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
 - 5. Work is completed and ready for final construction review.
- B. Engineer will perform a review to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should Engineer consider that the work is incomplete or defective:
 - 1. Engineer will promptly notify the Contractor in writing, listing the incomplete or defective work.
 - 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Engineer that the work is complete.
 - 3. Engineer will again review the work.
- D. When the Engineer finds that the work is acceptable under the contract documents, he shall request the Contractor to make closeout submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

- A. Depths of various elements of foundation in relation to finish grade.
- B. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
- C. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
- D. Field changes made by Field Order or by Change Order.
- E. Details not on original Contract Drawings.

1.05 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the Engineer.
- B. Statement shall reflect all adjustments to the Contract Sum:
 - 1. The original Contract Sum.
 - 2. Additions and deductions resulting from:

- a. Previous change orders.
- b. Allowances.

PART 2: (Not Used)

PART 3: (Not Used)

END OF SECTION

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SECTION 01730

OPERATION AND MAINTENANCE MANUAL

PART 1: GENERAL

1.01 GENERAL

- A. Prior to final acceptance, furnish five (5) copies of an Engineer approved "OPERATION AND MAINTENANCE MANUAL" for each piece of equipment or system as called for in the individual specifications.
- B. Items of equipment from the same manufacturer with the same model number and the same Operation and Maintenance (O&M) requirements may be addressed in the same O&M Manual.
- C. Identify equipment, systems and components using the names and identification numbers used in the Contract Documents. Do not use manufacturer's identification numbers in lieu of the specified identifications.
- D. Contractor shall ensure that all previous submittal comments have been addressed in the O&M Manual.

1.02 SUBMITTALS

- A. Submit hard copy material suitable for reproduction
 - 1. Ensure quality submitted is equal to the original
 - 2. All material, except that containing photographs, may be photocopied.
- B. Submit electronic files that duplicate the material provided in hard copy.
 - 1. Prepare all electronic files using the same software.
 - 2. Use only commercially available software.
 - 3. Use the most current version of the software.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION

3.01 MANUAL FORMAT

- A. Hard Copy Submittals
 - 1. Size: 8½ inches x 11 inches or 11 inches x 17 inches folded to fit in the 8½-inch x 11-inch binder.
 - 2. Paper: 24-pound bond minimum, white for typed pages
 - 3. Text: Manufacturer's printed data, or neatly typewritten.
 - 4. Drawings:

- a. Provide reinforced punched binder tabs, bound with text.
 - b. Use three hole punch and ensure holes do not destroy text or graphics.
 - c. Reduce larger drawings to 8½ inches x 11 inches, or reduce and fold to size of text pages, but not larger than 11 inches x 17 inches.
 - d. Where reduction is not practical, fold and place into 8½-inch x 11-inch plastic, pre-punched envelopes bound with text.
 - e. Identify Specification Section and Product on Drawings and on envelopes.
5. Provide fly-leaf inserts for each separate product, or each piece of operating equipment.
 - a. Provide typed description of products and major component parts of equipment.
 - b. Provide indexed tabs.
 6. Cover: Identify each volume with typed or printed title "OPERATION AND MAINTENANCE MANUAL, VOLUME ___ OF ___." List:
 - a. Title of Project. Canton Wastewater Treatment Plant Expansion to 6 MGD
 - b. Date: Date of submittal
 - c. Identity of general subject matter covered in the manual for each structure or operation. Include both systems and equipment.
 - d. Equipment Identification number and Specification Section number.
 7. Binders:
 - a. Final Manuals:
 - 1) Commercial quality three-ring binders (oil, moisture, and wear resistant)
 - 2) Durable and cleanable plastic covers.
 - b. When multiple binders are used, correlate the data into related consistent groupings.
- B. Electronic Copy Submittals
1. CD-Rom labeled to identify specification section and product.
 2. Include all of the information included in the paper copy of the manual.
 3. Adobe Acrobat (.pdf) format, readable through the latest version of Adobe Acrobat Reader.
 - a. Convert the document directly from the authoring software. Avoid scanning documents. Text shall remain editable in the Acrobat format.
 - b. When used, provide internal rather than "cross-document" links. Wherever possible, provide only one .pdf file for each system or piece of equipment.
 - c. Provide bookmarks within the document to assist in navigation.

- d. Set resolution to achieve files of a practical and reasonable size, while retaining clarity for on-screen viewing and printing.
 - e. Do not include any file locking mechanisms that would prevent the subsequent addition of pages, bookmarks, text, or hyperlinks.
 - f. Use pen weights and colors for conversion of AutoCAD drawings such that the Acrobat files can be viewed and printed as they would appear if printed directly from AutoCAD.
4. Format subject to approval of the Engineer.
 5. Video: Use DVD format

3.02 GENERAL MANUAL CONTENTS

- A. Each O&M Manual submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: "Certification Statement: Through submittal of this O&M Manual, I hereby represent that I have determined and verified that this Manual contains project specific O&M data including as-built field data, equipment tag numbers, warranty information, and I have checked and coordinated each item with previous submittal comments and all Contract requirements." Provide to the Resident Project Representative a copy of each transmittal sheet for O&M Manuals at the time of submittal to the Engineer.
- B. Immediately following the Table of Contents, identify the following for each and every product, equipment item and process system addressed in this volume of the manual:
 1. Product, equipment item or process system
 - a. Name
 - b. "Equipment Identification Number" shown on the Contract Drawings or the appropriate P&ID Drawing Number
 - c. Name, address and telephone number of manufacturer or supplier.
 2. Contractor or sub-contractor responsible for installation.
 - a. Name, Address and Telephone Number of responsible principal.

3.03 PRODUCT AND EQUIPMENT MANUAL CONTENTS

- A. Address each product, equipment item and process system. Include all components, options, accessories and ancillary devices.
 1. Complete nameplate data.
 2. Provide copies of warranty, bond and service agreements. Include information sheets that specify:
 - a. Proper procedures to follow in event of failure.
 - b. Circumstances that might affect validity of warranty or bonds.
 3. Include information on all lighting fixtures.
 - a. Provide manufactures product sheets.

- b. Identify rooms and areas in which fixtures are installed.
 4. Describe smoke and fire detection systems.
 - a. Provide operating instructions.
 - b. Identify required certifications and testing.
 5. Describe security systems provided in the equipment or process area addressed. Include operating instructions.
 6. Provide manufacturers data and maintenance instructions for all architectural products, applied materials and finishes in each respective equipment or process area. Include:
 - a. Catalogue number, size and composition.
 - b. Color and texture designations.
 - c. Re-ordering information for specialty items.
 - d. Recommended cleaning agents and methods.
 - e. Identify cleaning agents and methods that may be detrimental to the product.
 - f. Provide recommended cleaning and maintenance schedules.
 7. Provide manufacturers' data and maintenance instructions for all moisture protection products. Include:
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Installation details.
 - d. Inspection, maintenance and repair instructions.
 8. List each valve provided for the project. Identify:
 - a. Tag No. for automatic and electric valves
 - b. Valve Type
 - c. Manufacturer
 - d. Location
 - e. Service
 9. List spare parts provided. Also list recommended spare parts, if different than those provided.
 10. List recommended and at least one alternative for each consumable item such as lubricants, filters, etc.
 11. Address information required by the individual equipment specifications.
- B. Describe each product, equipment item and process system in detail.
 1. Include a functional operating description.
 2. Use project specific tag numbers and names

- C. Provide manufacturer's product data.
 - 1. Clearly identify specific product or part installed.
 - 2. Delete references to inapplicable information.
 - 3. List complete model number needed to order an exact duplicate.
- D. Drawings
 - 1. Show all parts, assemblies, and sub-assemblies.
 - a. Clearly indicate arrangement and the relationship of component parts.
 - b. Include "Bill of Materials".
 - 2. Provide detailed flow and control diagrams.
 - 3. Show the "As-Built" installation. Do not use Project Record Documents as the O&M drawings.
 - 4. Provide detailed electrical drawings.
 - a. Show control devices with the manufacturer provided conduit and wiring.
 - b. Provide detailed control schematics.
 - c. Include control panel layouts with a "Bill of Materials".
 - d. Identify terminal strips and wiring terminations.
 - e. Identify each different source of power using project specific nomenclature.
 - f. Identify the rating of all fuses and breakers.
- E. Provide the following for all equipment or systems with electronic controls:
 - 1. Electronic versions of "As-Built" control logic.
 - 2. Programmer and User manuals.
 - 3. Configuration parameters.
 - 4. Set points.
 - 5. Configuration "dip" switch settings.
 - 6. Programming software on electronic media compatible with the Owner's computer hardware.
- F. Provide a detailed written description, with illustrations as appropriate, of each of the following:
 - 1. Normal operating procedures for each mode of operation.
 - 2. Routine maintenance requirements included recommended service intervals.
 - 3. Detailed disassembly, repair, and reassembly procedures.
 - 4. Procedures for equipment inspection, alignment, and adjustment.

5. Lubrication procedures.
 6. Long term storage procedures.
 7. Start up and shut down procedures.
 8. Operating adjustments for items such as time delays, start and stop elevations, etc.
 9. Troubleshooting procedures.
 10. Programming procedures.
 11. Emergency and safety procedures.
- G. Copies of all information provided in the “Approved” product data or shop drawing submittals.
- H. Equipment performance or test curves.
- I. List of alarms and set points when equipment is controlled by an external control system.

3.04 PROCESS SYSTEM MANUAL CONTENTS

- A. Address each process system. As a minimum, include all systems shown on the Process and Instrumentation Drawings (P&ID) provided in the Contract Documents.
- B. Describe each unit and component part with regards to the following:
1. Operating theory for the process.
 2. Equipment provided its purpose, and how the equipment functions within the system.
 3. Describe all electrical and control system functions, control panel functions, and equipment functions in each and every operating mode.
- C. Provide a detailed description of the following:
1. Automatic operation of each electrical, electronic and process system and related component. Include a description of the following:
 - a. Valving.
 - b. Positions of Controls and Instrumentation.
 2. Manual operation of each process system and related component.
 - a. Valving.
 - b. Positions of Controls and Instrumentation.
 3. Normal start up and shut down procedures.
 4. Break in instructions, if applicable.
 5. Emergency operation

6. Seasonal operating instructions, if applicable.
 7. Routine servicing and repairs.
 8. Disassembly, major overhaul and repair, and reassembly.
 9. Process system trouble shooting guide.
 10. Safety issues.
- D. Provide the results of all “factory tests.” Include performance curves, test data and the final test report.
- E. Provide “As Built” drawings of the following:
1. Process and Instrumentation Diagrams.
 - a. Show equipment and valve tag numbers per the Contract Drawings.
 2. Equipment, system, and component layout drawings.
 - a. Address both electrical (motor control centers, panel boards, switch boards, etc.) and process/mechanical equipment.
 - b. Include outline drawings showing relays, meters, controls and indication equipment mounted on the equipment or inside cubicles.
 - c. Provide control and protective schematics with their recommended relay settings.
 3. Single line drawings
 4. Control diagrams
 5. Wiring and connection diagrams.
 - a. Include components and the system as a whole.
 - b. Show wire sizes and identification
- F. Nameplate data for each electrical and process/mechanical equipment item, including motors.
- G. A complete directory for each panel board, motor control center and switch board. Use a separate sheet for each directory.
- H. Time-current characteristics curve for each type of fuse, overload device, circuit breaker and protective relay.
- I. Provide photographs, sketches, and other drawings necessary to convey the required information.

END OF SECTION

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SECTION 01731

AS-BUILT DRAWINGS

PART 1: GENERAL

1.01 REQUIREMENTS

- A. Prior to final acceptance the Contractor shall furnish "AS-BUILT DRAWINGS" for the project to the Owner.

PART 2: PRODUCT

2.01 FORMAT

- A. All deviations from contract documents including actual dimensions and elevations shall be marked in red ink. The drawings shall be submitted as "AS-BUILT DRAWINGS".
- B. Full-size drawings in AutoCAD electronic format shall be required for final submittal.

PART 3: EXECUTION

3.01 SUBMITTAL

- A. Submit in accordance with Section 01700 of these specifications.

3.02 MAINTENANCE

- A. As-Built Drawings will be maintained during the construction of the project and available for review at any time. The drawings shall be maintained at the work site by the Contractor.
- B. Contractor maintained "As Built Drawings" shall be reviewed by the Engineer as part of the monthly Contractor pay request.
- C. Provide record drawings for all work performed.
- D. Maintain one record copy of all Contract Documents at the site in good order and annotated to show all revisions made during construction.
 - 1. Keep annotations current.
 - A. Store record drawings and samples in Contractor's field office apart from documents used for construction.
 - B. Provide files, racks, and secure storage for record documents and samples.
 - C. Label and file record documents and samples in accordance with Specification Section number listings in Table of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

- D. Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
 - E. Record drawings may be inspected monthly.
 - F. Failure to maintain current record drawings will be cause to delay progress payments.
- 2. Make record drawings available to the Engineer at all times during the life of the Contract.
- E. Record drawings shall include, but are not limited to the following:
 - 1. Contract Drawings
 - A. Annotate or redraft, as required.
 - B. Show all revisions, substitutions, variations, omissions and discrepancies made or discovered during construction
 - C. Show changes in the location and depth of utilities, piping, ductbanks, conduits, manholes, pumps, valves, vaults and other equipment.
 - D. Show revisions on all drawing views with actual dimensions established to permanent points.
 - 2. Working Drawings
 - A. Same as Contract Drawings whenever working drawings are required.
 - B. Examples include actual layouts of conduit runs between various items of electrical equipment for power, control and instrumentation; wire sizes, numbers and functions; configuration of conduits; piping layouts; and duct layouts.
 - C. Add sections and details as required, for clarity.
 - D. Revise drawings of switchgear, motors, control centers and other equipment to show actual installations.
 - F. Provide as-built survey data, under seal and recorded by a registered land surveyor licensed in the State of Georgia to document all changes in alignment or elevation for utilities shown on the Drawings.
 - G. Final deliverable of "As Built Drawings" shall be provided in AutoCAD format. Format for use of AutoCAD record drawings shall be coordinated with the Engineer.

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1: GENERAL

1.01 PROJECT MAINTENANCE AND WARRANTY

- A. Contractor shall maintain and keep in good repair improvements covered by these Contract Documents over the life of the contract.
- B. Indemnify the Owner against any repairs which may become necessary to any part of the work performed and to items of equipment and systems procured for or furnished under this Contract, arising from defective workmanship or materials used therein, for a period of one year after date of Substantial Completion.
- C. The Contractor shall not be obligated to make replacements which become necessary of ordinary wear and tear, or because of improper operation or maintenance, or because of improper work or damage by another Contractor or the Owner, or to perform any work which is normally performed by a maintenance crew during operation.
- D. In the event of multiple failures of major consequences prior to the expiration of the (1) one-year warranty described above, the affected unit shall be disassembled, inspected, and modified or replaced as necessary to prevent further occurrences. All related components, which may have been damaged or rendered non-serviceable as a consequence of the failure, shall be replaced. A new (12) twelve-month warranty against defective or deficient design, workmanship, and materials shall commence on the day that the item is reassembled and placed back into operation. As used herein, multiple failures shall be interpreted to mean (2) two or more successive failures of the same kind in the same item or failures of the same kind in (2) two or more items. Major failures may include, but are not limited to, cracked or broken housings, piping, or vessels, excessive deflections, bent or broken shafts, broken or chipped gear teeth, premature bearing failure, excessive wear, or excessive leakage around seals. Failures, which are directly and clearly traceable to operator abuse, such as operations in conflict with published operating procedures, or improper maintenance, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over-or-under lubrication, and using maintenance procedures not conforming with published maintenance instructions, shall be exempted from the scope of the (1) one-year warranty. Should multiple failures occur in a given time, all products of the same size and type shall be disassembled, inspected, modified or replaced, as necessary and rewarranted for (1) one-year.
- E. The Contractor shall, at his own expense, furnish all labor, tools and equipment required and shall make such repairs and removals or shall perform such work or reconstruction as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship of faulty materials, in any part of the Work performed by him. Such repair shall also include refilling of trenches, excavations or embankments which show settlement or erosion after backfilling or placement.

- F. Except as noted on the Drawings or as specified, all structures such as embankments and fences shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility not designated for removal, resulting from the Contractor's operations, shall be promptly repaired by the Contractor at no cost to the Owner.
- G. In the event the Contractor fails to proceed to remedy the defects of which he has been notified within (15) fifteen days of the date of such notice, the Owner reserves the right to cause the required materials to be procured and the work to be done, as described in the drawings and specifications, and to hold the Contractor and the sureties on his bond liable for the cost and expense therefore.
- H. Notice to Contractor for repairs and reconstruction will be made in the form of a registered letter addressed to the Contractor at his home office.
- I. Neither the foregoing paragraphs nor any provision in the Contract Documents, nor any special guarantee time limit implies any limitation of the Contractor's liability with the law at the location of the construction.

END OF SECTION