PROJECT MANUAL

Water Treatment Plant
High Service Pump Improvements
for
City of Lake Worth
IFB # 16 - 116
Project #WT1504

May 2016

Prepared by:

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5720 Corporate Way
West Palm Beach, Florida

Engineer's Project
No. B5015.00

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High Service Pump Improvements for
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IFB #16-116

Date: May 5, 2016

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INVITATION TO BID

Sealed bids, in duplicate, will be received by City of Lake Worth Procurement Office, City Hall, 2nd Floor, 7 North Dixie Highway, Lake Worth, Florida 33460 for the subject Project until 3:00 p.m., local time June 9, 2016, then opened publicly at that time.

The OWNER for the Project is City of Lake Worth, Florida.

The Contract Documents will be open to inspection at Mock, Roos & Associates, Inc., 5720 Corporate Way, West Palm Beach, Florida 33407 or in electronic form on the City of Lake Worth website: www:lakeworth.org/business/bids. All questions are to be submitted in writing to Mock•Roos (email address: john.leemon@mockroos.com). The last day to submit questions is five business days before bids are due.

Contract Documents may be obtained in electronic form from Demand Star. Any bid received must be plan holders of record with Demand Star. Any bid received from a bidder that is not a plan holder of record will be returned unopened.

A non-mandatory prebid meeting will be held at 10:00 a.m. on May 25, 2016 at the Water Treatment Plant. Although the meeting is not mandatory, all prospective bidders are encouraged to attend.

This Contract is a unit price contract.

Bids must be accompanied by a Bid Security in the form of a certified or bank check made payable to the Owner, or a Bid Bond. The amount of the security shall not be less than five (5) percent of the Bidder's total price indicated in Bid Form.

No Bid may be withdrawn for a period of 120 days after the scheduled closing date for the receipt of bids except as otherwise provided in Article 13 of the Instructions to Bidders.

The successful Bidder, who is awarded the Contract, shall be required to furnish a 100% Construction Performance Bond and a 100% Construction Payment Bond.

The OWNER reserves the right to reject any or all Bids, to waive informalities, and to re-advertise.

/s/ Brian Shields, P.E., Water Utilities Director

Publish: Palm Beach Post – May 8, 2016

00100
INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS.

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract (EDCJC No. 1910-8, 1983 Edition) have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a bid to a Bidder. The term "Successful Bidder" means the lowest, qualified, responsible and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

2. COPIES OF BIDDING DOCUMENTS.

2.1. Complete sets of the Bidding Documents in the number and for the cost, if any, stated in the Advertisement or Invitation to Bid may be obtained from Engineer (unless another issuing office is designated in the Advertisement or Invitation to Bid).

2.2. Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

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 on the Work and do not confer a license or grant for any other use.

3. QUALIFICATIONS OF BIDDERS.

To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five days of Owner's request, written evidence such as financial data, previous experience, present commitments and other such data as may be reasonably specifically requested by Owner or otherwise required in Contract Documents. Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the contract.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE.

4.1. It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work, (c) consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.

4.2. Reference is made to Division 1: General Requirements of the Specifications for the identification of:

4.2.1. those reports of explorations and tests of subsurface conditions at the site which have been utilized by Engineer in preparation of the Contract Documents.

4.2.2. those drawings of physical conditions in or relating to existing surface and subsurface conditions (except Underground Facilities) which are at or contiguous to the site which have been utilized by Engineer in preparation of the Contract Documents.

4.2.3. Copies of such reports and drawings (referred to above), if not attached to the Specifications or added on the Drawings, will be made available by Owner to any Bidder on request. Those reports and drawings are not a part of the Contract Documents. Bidder may not rely upon the accuracy of the non-technical data, interpretations or opinions contained in those reports and drawings. Bidder may

not rely on the completeness of those reports and drawings for the purposes of bidding or construction. Bidder may rely on any technical data contained in those reports and drawings specifically referenced in Division 1: General Requirements as technical data that can be relied on.

4.3. Information and data reflected in the Contract Documents with respect to 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 or others, and Owner does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.

4.4. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Facilities and other physical conditions, and possible changes in Contract Documents due to differing conditions appear in Paragraphs 4.2 and 4.3 of the General Conditions.

4.5. Before submitting a Bid, each Bidder will, at Bidder's own expense, be responsible to make or obtain such examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical 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 and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

4.6. On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.

4.7. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents.

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 Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA.

5.1. All questions about the meaning or intent of the Contract Documents are to be directed to Engineer (unless another issuing office is designated in the Advertisement or Invitation to Bid). 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 issuing office as having received the Bidding Documents. Questions received less than five days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

5.2. Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.

6. BID SECURITY.

6.1. Each Bid must be accompanied by Bid security made payable to Owner in an amount of five percent of the Bidder's maximum Bid price and in the form of a certified or bank check or a Bid Bond issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions.

6.2. The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within fifteen days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of the Bidder will be forfeited. 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 the seventh day after the Effective Date of the Agreement or the 120th day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within seven days after the Bid opening.

7. CONTRACT TIME.

The numbers of days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Bid Form and the Agreement. If Contract Times are left blank in the Bid Form, the time for Substantial Completion and final completion are to be set forth by Bidder in the Bid and will be included in the Agreement. The times will be taken into consideration by Owner during the evaluation of Bids, and it will be necessary for the Successful Bidder to satisfy Owner of Bidder's ability to achieve Substantial Completion and final completion within the times designated in the Bid.

8. LIQUIDATED DAMAGES.

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

9. SUBSTITUTE OR "OR-EQUAL" ITEMS.

The contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications 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. The procedure for submission of any such application by Contractor and consideration by Engineer is set forth in Paragraphs 6.7.1, 6.7.2 and 6.7.3 of the General Conditions and may be supplemented in Division 1: General Requirements.

10. SUBCONTRACTORS, SUPPLIERS AND OTHERS.

10.1. If the Bid Form or Specifications require (or if Owner requests after Bids are received) the identity of certain Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to Owner in advance of the specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within seven days after the Bid opening (or seven days after request by Owner) submit to Owner a list of all such Subcontractors, Suppliers and other persons and organizations 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, person or organization if requested by Owner. Subcontractors shall be required to meet Contractor's liability insurance requirements as established by the General and Supplementary Conditions or be listed as an additional insured on the apparent successful Bidder's policy. If Owner or Engineer after due investigation has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, either may before the Notice of Award is given request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price. 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 and other persons and

organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom Owner or Engineer does not make 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 6.8.2 of the General Conditions.

10.2. No Contractor shall be required to employ any Subcontractor, Supplier, other person or organization against whom Contractor has reasonable objection.

11. BID FORM.

11.1. The Bid Form is included with the Bidding Documents; additional copies may be obtained from Engineer (or the issuing office).

11.2. All blanks on the Bid Form must be completed in ink or by typewriter.

11.3. Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

11.4. Bids by partnerships must be executed in the partnership name and signed by a general partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

11.5. All names must be typed or printed below the signature.

11.6. The Bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which must be filled in on the Bid Form). All Addenda are a part of the Bid documents and each Bidder will be bound by such Addenda, whether or not received by the Bidder. It is the responsibility of each Bidder to verify that he or she has received all Addenda issued before Bids are opened.

11.7. The address and telephone number for communications regarding the Bid must be shown.

12. SUBMISSION OF BIDS.

Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and name and address of the Bidder and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED FOR (insert project name) TO BE OPENED (insert date and time as indicated in the Invitation to Bid or subsequent addenda) " on the face of it.

13. MODIFICATION AND WITHDRAWAL OF BIDS.

13.1. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

13.2. If, within twenty-four 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, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

14. OPENING OF BIDS.

Bids will be opened (publicly or privately) as indicated in the Invitation to Bid.

14.1. When Bids are opened publicly they will be read aloud, and the amounts of the base Bids and major alternates (if any) will be made available after the opening of Bids. If applicable, the bid will be opened in accordance with sec. 255.0518, Florida Statutes.

14.2. When Bids are opened privately, an abstract of the same information (will or will not) be made available to Bidders within seven days after the date of Bid opening.

15. BIDS TO REMAIN SUBJECT TO ACCEPTANCE.

All bids will remain subject to acceptance for 120 days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to that date.

16. AWARD OF CONTRACT.

16.1. Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work and to negotiate contract terms with the Successful Bidder, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make and award to the Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

16.2. In evaluating Bids, Owner will consider the qualifications of the Bidders, 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.

16.3. Owner may consider the qualifications and experience of Subcontractors, Suppliers and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions (or as requested by Owner after the Bids are received). Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

16.4. Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

16.5. If the contract is to be awarded, it will be awarded to the lowest Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Project and subject to the Owners Local Preference Policy. No. bidder shall be accepted from, nor will any Contract be awarded to any Bidder who is in arrears to the Owner upon any debt or Contract or who is a defaulter as surety or otherwise upon any obligation to the Owner or who has failed to perform faithfully any previous Contract with the Owner or other party as determined by the Owner.

16.6. If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within 120 days after the day of the Bid opening.

16.7. When Bidder is permitted to designate the Contract Time, Bid prices will be compared after adjusting for differences in the time designated in the Bid for Substantial Completion.

17. CONTRACT SECURITY.

Paragraph 5.1 of the General Conditions and the Supplementary Conditions set forth Owner's requirements as to performance and payment Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required performance and payment Bonds.

18. SIGNING OF AGREEMENT.

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within 15 days thereafter Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds. In the event the successful Bidder fails to execute the Contract and return same to the Owner within the stipulated fifteen (15) days, the Owner may disqualify the Bid, and said Bidder shall not be permitted to contest to the contrary and does waive such right upon submitting a Bid.

19. DISQUALIFICATION OF BIDDER

19.1 Bidder may be disqualified and its Bid rejected for any of the following:

a) Bidder does not meet the Competency of Bidder and Reference requirements set forth herein.
b) Reason to believe that collusion exists among or between Bidders
c) Unbalanced Bid; that is, Bid in which the prices bid for some items are out of all proportion to those Bids of others.
d) Bidder's uncompleted workload, which in the judgment of the Owner, may cause detrimental impact or impair the prompt completion of this Contract.
e) Lack of responsibility on the part of Bidder, (for example, no Bidder would be considered responsible who had failed to carry out any Contract in which the Owner had been directly or indirectly concerned), or to which Bidder failed to perform on other projects.
f) A determination by Owner of the Contractor's lack of experience or lack of competency as may be revealed by qualification statements, financial statements, experience records, references, or other questionnaires.
g) Substantial evidence of bad character or dishonesty.
h) Bidder is involved in any current litigation with Owner.
i) Bidder has defaulted on any contract or is in arrears on any contract.

20. LICENSES, PERMITS, AND CERTIFICATION

20.1 When applicable, vendor must hold a Certificate of Competency issued by the State of Florida or the Palm Beach County Construction Industry Licensing.

20.2 An Occupational License obtained from the Owner shall be required of any person maintaining a permanent business location or branch office within the City of Lake Worth.

20.3 A copy of any licenses and permits shall be submitted with the Bid and must be in the name of the vendor shown on the Bid submittal.

21. PREPARATION EXPENSE

21.1 Neither the Owner nor its representatives will be liable for any expenses incurred in connection with the preparation, presentation or submittal of any Bid.

22. NON-COLLUSION

22.1 Bidder certifies that this Bid is made without prior understanding, agreement, or connection with any individual, firm, partnership, corporation or other entity submitting a Bid for the same materials, services, supplies, or equipment and is in all respects fair and without collusion or fraud. No premiums, rebates, or gratuities are permitted with, prior to, or after any delivery of material or

provisions of services. Any violation of this provision may result in Contract cancellation, return of materials or discontinuation of services, and the possible removal of Bidder from the vendor Bid list(s).

23. CODE OF ETHICS

23.1 If any Bidder violates or is a party to a violation of the Code of Ethics of the Owner, Palm Beach County, and/or of the State of Florida with respect to this Bid, such Bidder may be disqualified from performing the work described in this Bid or from furnishing the goods or services for which this Bid is submitted and may be further disqualified from bidding on any future Bids for work or for goods or services for the Owner.

24. CONFLICT OF INTEREST

24.1 The award is subject to any and all applicable conflict of interest provisions found in the policies or Code of Ordinances of the City, the Palm Beach County Code of Ethics, and found in the Florida Statutes. All Bidders must complete the Conflict of Interest Form attached hereto.

25. DRUG FREE WORKPLACE PROGRAMS

25.1 Preference may be given to businesses with Drug-Free Work Place Programs. Whenever two or more Bids which are equal with respect to price, quality, and service are received by the Owner for the procurement of commodities or contractual services, a Bid received from a business that completes the attached DFW form certifying that it is a DFW may be given preference in the award process.

26. LEGAL REQUIREMENTS

26.1 Federal, State, County and Owner laws, ordinances, rules, codes, guidelines, directives and regulations that in any manner affect the items covered herein apply. Lack of knowledge by the Bidder shall in no way be a cause for relief from responsibility.

27. COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT

27.1 The Bidder certifies that all equipment and materials contained in this Bid shall meet all O.S.H.A. requirements. Bidder further certifies that, if it is the successful Bidder and the equipment and/or materials delivered are subsequently found to be deficient in any O.S.H.A. requirements in effect on the date of delivery, all costs necessary to bring the equipment and/or materials into compliance with the aforementioned requirements shall be borne by the Bidder.

28. NON-APPROPRIATIONS

28.1 The obligations of the Owner to make a Bid award and sign an agreement under the terms of this "Invitation to Bid" are contingent upon funds lawfully appropriated for this purpose. Should funds not be appropriated for this purpose, the Owner, at its sole discretion, shall have the right to reject all Bids.

29. FLORIDA PUBLIC RECORDS ACT AND CONTRACT CONTENT OWNERSHIP

29.1 All material submitted regarding this Bid becomes the property of the Owner. Pursuant to sec. 119.07(1), Fla. Stat., sealed Bids received by the Owner pursuant to a competitive solicitation are subject to disclosure when the Owner provides notice of an intended decision or until thirty (30) after opening of the Bids, whichever is earlier. If the Owner rejects all bids submitted in response to a competitive solicitation and the Owner concurrently provides notice of its intent to reissue the competitive solicitation, the rejected bids remain exempt from sec. 119.07(1), Fla. Stat., until such time as the Owner provides notice of an intended decision concerning the reissued competitive solicitation or until the Owner withdraws the reissued competitive solicitation. A Bid is not exempt from disclosure for longer than 12 months after the initial notice rejecting all Bids made by the Owner. Bidder should take special note of this as it relates to any proprietary information that might

be included in their offer. Any resulting contract may be reviewed by any person after the contract has been executed by the Owner. The Owner has the right to use any or all information/material submitted in response to this bid and/or any resulting contract from the same. Disqualification of a Bidder does not eliminate this right.

29.2 Contractor shall comply with Florida's Public Records Laws, and, if applicable, specifically agrees to:

a) Keep and maintain public records that ordinarily and necessarily would be required by the Owner in order to perform the service.
b) Provide the public with access to public records on the same terms and conditions that the Owner would provide the records and at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.
c) Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law.
d) Meet all requirements for retaining public records and transfer, at no cost, to the Owner all public records in possession of the Contractor upon termination of the Contract Documents and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the Owner in a format that is compatible with the information technology systems of the Owner.

END OF SECTION

BID FORM MUST BE SUBMITTED IN DUPLICATE

BIDDER: _____

PROJECT: Water Treatment Plant
High Service Pump Improvements for
City of Lake Worth

DATE: _____
(Bid Submitted on)

00300
BID FORM

THIS BID IS SUBMITTED TO:

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 Contract Price and within the Contract Time 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 120 days after the day of Bid opening. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within 15 days after the date of OWNER's Notice of Award.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

(a) BIDDER has examined copies of all the Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

Date	Number

(b) BIDDER has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

(c) BIDDER has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Division 1: General Requirements as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in Division 1: General Conditions of the extent of the technical data contained in such reports and drawings upon which BIDDER is entitled to rely.

(d) BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement those referred to in (c) above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as BIDDER considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by BIDDER for such purposes.

(e) BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports or similar information or data in respect of said Underground Facilities are or will be required by BIDDER in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

(f) BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

(g) BIDDER has given ENGINEER written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER.

(h) 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. BIDDER agrees to perform all the Work described in Contract Documents, subject to adjustments as provided therein, for the Prices BIDDER provides on the Unit Price Schedule (Page 00300– thru 00300–):

5. BIDDER declares it understands that the unit quantities shown on the Bid Form Unit Price Schedule are approximate only and not guaranteed and are subject to either increase or decrease; and that should the quantities of any of the items of Work be increased, the BIDDER agrees to do the additional Work at the unit prices set out herein, and should the quantities be decreased, BIDDER also understands that final payment shall be made on actual quantities completed at the unit prices, and shall make no claims for anticipated profits for any decrease in the quantities.

6. The BIDDER further declares it understands the OWNER may elect to construct only a portion of the Work covered by these Documents and BIDDER agrees to perform that portion of the Work for which BIDDER is awarded a Contract at the unit prices quoted herein.

7. BIDDER agrees that the Work:

will be substantially complete within 150 calendar days after the date when the Contract Time commences to run as provided in paragraph 2.3 of the General Conditions, and completed and ready for final payment within 180 calendar days after the date when the Contract Time commences to run.

BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work on time.

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

(a) Required Bid Security in the form of _____.

(b) Unit Price Schedule on Page(s) 00300-5.

(c) Trench Safety Affidavit on Page(s) 00300-6.

(d) Schedule of Subcontractors (Page(s) 00300-7)

(e) Schedule of Suppliers, Equipment and Materials (Page(s) 00300- 8)

(f) Sworn Statements Under Section 287.133(3)(a), Florida Statutes, on Public Entity Crimes on Page(s) 00300-9 and 00300-10.

(g) (List other documents as pertinent): Certification of Drug Free Workplace Program Page 00300-11.

9. Communications concerning this Bid shall be telephoned or addressed to:

The phone number and address of BIDDER indicated below.

10. The terms used in this Bid which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

11. BIDDER's Florida Contractor's License No. _____.

12. BIDDER covenants that it is qualified to do business in the State of Florida and has attached evidence of BIDDER's qualification to do business in the State of Florida, or if not attached, BIDDER covenants to obtain such evidence within five days of request by OWNER to provide evidence.

If BIDDER is:

An Individual

By _____ (SEAL)
(Individual's Name)

_____
(Signature)

doing business as _____

Business address: _____

_____

Phone No. : _____

A Partnership

By _____ (SEAL)
(Firm Name)

_____
(General Partner) (Signature)

Business address: _____

_____

Phone No. : _____

A Corporation

By _____ (SEAL)
(Corporation Name)

_____
(State of Incorporation)

By _____
(Name of Person Authorized to Sign)

_____
(Title)

_____
(Signature)

(Corporate Seal)

Attest _____
(Secretary)

_____
(Signature)

Business address: _____

_____

Phone No. : _____

Unit Price Schedule

Item	Description	Qty	Unit	Amount
A. General				
1.	Mobilization & Demobilization	1	LS	
2.	Bonds and Insurance	1	LS	
3.	Permit Fees	1	LS	
4.	Video Inspection of Site	1	LS	
5.	Record Drawings	1	LS	
6.	General Allowance	1	LS	$ 40,000.00
			Subtotal A	
B. Water Treatment Plant Improvements				
1.	High Service Pump Nos. 3 and 4 and Appurtenances	1	LS	
2.	High Service Pump Nos. 3 and 4 Check Valves	1	LS	
3.	High Service Pump No. 1 Check Valve	1	LS	
4.	High Service Piping, Valves, etc.	1	LS	
5.	Ammonia Booster Pump System & Hydro pneumatic Tank	1	LS	
6.	Ammonia Softener System and Appurtenances	1	LS	
7.	Painting and Misc.	1	LS	
			Subtotal B	
C. Electrical & Instrumentation				
1.	Booster Pump Electrical	1	LS	
2.	Instrumentation	1	LS	
3.	SCADA System Programming for Above	1	LS	
4.	Electrical Conduit & Wire	1	LS	
5.	Electrical Misc.	1	LS	
			Subtotal C	
			Base Bid Total Items A thru C	
D. Alternate Bid items				
1.	Plant Water Service Piping Modification including Demolition of Existing Piping	1	LS	
2.	High Service Pump VFD Retrofit Complete including SCADA Programming	1	LS	
			Subtotal D	
			Base Bid plus Alternate Bid Total Items A thru D	

PROJECT NO: B5015.00

TRENCH SAFETY AFFIDAVIT

(FAILURE TO COMPLETE THIS FORM MAY RESULT IN THE BID BEING DECLARED NON-RESPONSIVE)

_____ (NAME OF CONTRACTOR) hereby provides written assurance that compliance with applicable Trench Safety Standards identified in the Occupational Safety & Health Administration's Excavation Safety Standards, (OSHA) 29 C.F.R.S. 1926.650 Subpart P will be adhered to during trench excavation in accordance with Florida Statutes 553.60 through 553.64 inclusive (1990), "Trench Safety Act".

The undersigned acknowledges that included in the various items of the proposal and in the Total Bid Price are costs for complying with the Florida "Trench Safety Act" as summarized below: (Attach additional sheets as necessary)

Schedule Item	Trench Safety Measure (Slope, Trench Shield, etc.	Cost
		$
		$
		$
		$
		$
		$
	Total	$

_____

(Signature) (date)

STATE OF _____

COUNTY OF _____

Subscribed and Sworn to (or affirmed) before me on_____(date) by

_____(name). He/she is personally known to me or has

presented _____(type of identification) as identification.

_____ _____

Notary Public Signature and Seal Print Notary Name and Commission No.

SCHEDULE OF SUBCONTRACTORS

List Proposed Subcontractors	Category of Work

SCHEDULE OF EQUIPMENT AND MATERIALS

Description	Manufacturer	Model

SWORN STATEMENT UNDER SECTION 287.133(3)(a),
FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted to _____
[print name of the public entity]
by _____
[print individual's name and title]
for _____
[print name of entity submitting sworn statement]

whose business address is _____

_____

and (if applicable) its Federal Employer Identification Number (FEIN) is _____

(If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.)

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:

    1. A predecessor or successor of a person convicted of a public entity crime; or
    2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5. I understand that a "person" as defined in Paragraph 287.133(1)(c), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. [Please indicate which statement applies.]

_____ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. [attach a copy of the final order]

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
[signature]

_____
[date]

STATE OF _____

COUNTY OF _____

Subscribed and Sworn to (or affirmed) before me on _____ by
[date]
_____. He/she is personally known to me or has presented
[name]
_____ as identification.
[type of identification]

_____ _____
[Notary's Signature and Seal] Print Notary Name and Commission No.

Form PUR 7068 (Rev. 04/10/91)
M/R 03/06/92

CERTIFICATION OF DRUG FREE WORKPLACE PROGRAM

I certify the firm of _____ maintains a drug-free workplace program, and that the following conditions are met:

1. We publish a statement notifying employees that the unlawful manufacturer, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying that actions will be taken against employees for violations of such prohibitions.

2. We inform employees about the dangers of drug abuse in the workplace, the company's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. We give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection one (1).

4. In the statement specified subsection one (1) we notify the employee that; a condition of working in the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty nolo contendere to any violation of Chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. We impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is convicted.

6. We make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

_____
Contractor’s Signature

BIDDERS'S QUALIFICATION QUESTIONAIRE

(Include in Bids Envelope)

THE UNDERSGINED GUARANTEES THE TRUTH AND ACCURANCY OF ALL STATEMENTS AND ANSWERS HEREIN CONTAINED:

A. Any information judged by OWNER OR ENGINEER to be false is grounds for rejection of Bid and Cost Proposal. (Use additional sheets as required to provide the required information.)

B. The individual who holds the General Contractor's License shall be active in the management and ownership of the firm awarded the work and be available to provide their expertise for the project on an ongoing-basis. Provide the name of this individual for the complete duration of this project.

_____

1a. State the numbers of years your organization has been doing business in Florida.

_____

2. We normally perform _____% of the work with our own forces.
List trades below:_____

_____

_____

3. Have you ever failed to complete work awarded to you? If so, state where when and why

_____

_____

_____

_____

4. BIDDER shall have constructed at least five similar scope projects within the past five years. Provide the following information on an attached sheet.

Project Name:_____

Contract Amount:_____

Owner: _____Phone No:_____

Consultant /Engineer _____Phone No._____

Owner Contact: _____Phone No._____

Type of Project (details):_____

Date Completed:_____

Contract Schedule (days):_____

Actual Completion Schedule:_____

5. BIDDER shall demonstrate the ability to complete projects on time within the contract completion dates. List ALL within the last three years (started, underway, or completed):

   Project:_____

   Contract Schedule (days)_____

   Actual Completion Schedule (days)_____

6. List ALL projects within the past five years (started, underway, or completed) in which liquidated damages (LD) were incurred, either directly or indirectly:

   Project:_____

   LD Amount: _____

   LD Unit Price:_____

7. BIDDER shall specifically name proposed superintendents to be utilized on this project and identify years of experience.

   Name:_____

   Position:_____

   Years of Experience with BIDDER:_____

   Type of Work Responsible For:_____

   License:_____

8. BIDDER shall provide information related to the job safety and safety rating of the corporation:_____

9. (a) Please state your bonding capacity per project._____

(b) Please state your total bonding capacity._____

(c) Please provide name, address and contact person of your bonding company.

_____

_____

_____

13. State the true, exact, correct and complete name of the partnership, corporation or trade name under which you do business. (If corporation, state the name of the president and secretary. If a partnership, state the name of all partners. If a trade name, state the name of the individuals who do business under the trade name).

_____

(a) The business is a _____

(b) The address of the principal place of business is:_____

(c) The name of the corporate officers, or partners, or individuals doing business under a trade name are as follows:

_____

_____

If a Corporation, attach a copy of the most recent good standing certificate issued by the Secretary of State of Florida.

Date_____

Bidder:_____

By:_____

Title:_____

Mailing Address:_____

_____

END OF BIDDER'S QUALIFICATION QUESTIONNAIRE

00500
AGREEMENT

THIS AGREEMENT is dated and will be effective on the _____ day of _____ in the year 20__, by and between the City of Lake Worth (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:

Lake Worth Water Treatment Plant High Service Pump and related improvements.

ARTICLE 2. ENGINEER

The Project has been designed by Mock, Roos & Associates, Inc., 5720 Corporate Way, West Palm Beach, FL 33407,who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. CONTRACT TIME.

3.1. The Work will be substantially completed within 150 days from the date when the Contract Time commences to run as provided in paragraph 2.3 of the General Conditions and shall be finally complete and ready for final payment in accordance with paragraph 14.13 of the General Conditions within180 days from the date when the Contract Time commences to run.

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

3.3. **LIQUIDATED DAMAGES. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They 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 Five Hundred and 00/100 dollars ($ 500.00) for each day that expires after the time specified in paragraph 3.1 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 Five Hundred and 00/100 dollars ($500.00) for each day that expires after the time specified in paragraph 3.1 for completion and readiness for final payment.**

ARTICLE 4. CONTRACT PRICE.

OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents, subject to adjustment as provided therein, in current funds as follows:

4.1 An amount equal to the sum of the established unit price for each separately identified item on the Unit Price Schedule times the estimated quantity of that item:

TOTAL OF ALL UNIT PRICES _____ ($_____)
(use words) (figures)

which is based on the unit price(s) in the Bid Form Unit Price Schedule for Unit Bid Items numbered _____ to _____.

ARTICLE 5. PAYMENT PROCEDURES.

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.

5.1. PROGRESS PAYMENTS. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER, on or about the 10th day of each month during construction as provided below. All progress payments will be on the basis of the progress of the Work measured by the schedule of values established in paragraph 2.9 of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in Division 1: General Requirements.

5.1.1 Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below, but, in each case, less the aggregate of payments previously made and less such amounts as ENGINEER shall determine, or OWNER may withhold, in accordance with paragraph 14.7 of the General Conditions, less liquidated damages, if any.

90% of Work completed.
90% of materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in paragraph 14.2 of the General Conditions).
95% of the work complete after the Contractor has completed over 50% of the Work.

5.1.2 Upon Substantial Completion, in an amount sufficient to increase total payments to CONTRACTOR to 98% of the Contract Price, less such amounts as ENGINEER shall determine, or OWNER may withhold, in accordance with paragraph 14.7 of the General Conditions, less liquidated damages, if any.

5.2. FINAL PAYMENT. Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, and settlement of all claims, including liquidated

damages, if any, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said paragraph 14.13.

ARTICLE 6. (This Article left blank intentionally)

ARTICLE 7. CONTRACTOR'S REPRESENTATIONS.

In order to include OWNER to enter into this Agreement CONTRACTOR makes the following representations:

7.1. CONTRACTOR has familiarized itself with the nature and extent of the Contract Documents, Work, site locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

7.2. CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Division 1: General Requirements as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in Division 1: General Requirements of the extent of the technical data contained in such reports and drawings upon which CONTRACTOR is entitled to rely, if any.

7.3. CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies, if any, (in addition to or to supplement those referred to in paragraph 7.2 above) which pertain to the subsurface of physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.

7.4. CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents, if any, with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

7.5. CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

7.6. CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

7.7 CONTRACTOR acknowledges that the Contract Documents are generally sufficient to indicate and convey an adequate understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 8. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire Agreement between OWNER and CONTRACTOR concerning the Work consist of the following (listed in their Order of Precedence):

8.1. This Agreement consisting of 7 pages.

8.2. Exhibits to this Agreement identified as: Contractor's Corporate Resolution; Contractor's Certificate of Insurance; _____ inclusive.

8.3. Performance Bond and Payment Bond consisting of 4 pages (plus Power of Attorney Forms as applicable).

8.4. Notice of Award and Notice to Proceed.

8.5. General Conditions consisting of 33 pages.

8.6. Supplementary Conditions consisting of 10 pages.

8.7. Bid documents as listed in the table of contents of the Project Manual.

8.8. Specifications consisting of __ pages.

8.9. Drawings not attached hereto but are listed in Section 00860 List of Drawings.

8.10. Addenda numbers _____ to _____, inclusive.

8.11. CONTRACTOR's Bid consisting of _____ pages.

8.12. Documentation submitted by CONTRACTOR prior to Notice of Award.

8.13. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to paragraphs 3.4 and 3.5 of the General Conditions.

8.14. The documents listed under Article 8 above are attached to this Agreement (except as expressly noted otherwise above).

8.15. Notice of Compliance with Chapter 556, Florida Statutes, consisting of 1 page.

8.16. Any other document attached hereto or incorporated herein.

There are no Contract Documents other than those listed above in this Article 8. The Contract Documents may only be amended, modified or supplemented as provided in paragraphs 3.4 and 3.5 of the General Conditions.

ARTICLE 9. MISCELLANEOUS.

9.1. Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

9.2. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; 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 extend 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.

9.3. 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 of all covenants, agreements and obligations contained in the Contract Documents.

9.4. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be 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 replaced such stricken provision or part thereof with a valid and enforceable provisions that comes as close as possible to expressing the intention of the stricken provision.

9.5 A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a Bid on a Contract to provide any goods or services to a public entity, may not submit a Bid on a Contract with a public entity for the construction or repair of a public building or public work, may not be awarded or perform Work as a Contractor, Supplier, Subcontractor, or Consultant under a Contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for Category Two for a period of 36 months from the date of being placed on the convicted vendor list.

9.6 In accordance with Palm Beach County ordinance number 2011-009, the Contract Documents may be subject to investigation and/or audit by the Palm Beach County Inspector General. Contractor should review such ordinance in order to be aware of its rights and/or obligations under such ordinance and as applicable.

9.7 Failure of either party to enforce or exercise any right(s) under the Contract Documents shall not be deemed a waiver of either party's right to enforce said right(s) at any time thereafter.

9.8 TO ENCOURAGE PROMPT AND EQUITABLE RESOLUTION OF ANY LITIGATION, EACH PARTY HEREBY WAIVES ITS RIGHTS TO A TRIAL BY JURY IN ANY LITIGATION RELATED TO THE CONTRACT DOCUMENTS.

9.9 The Contractor is, and shall be, in the performance of all Work under the Contract Documents, an Independent Contractor, and not an employee, agent, or servant of the Owner. All persons engaged in any of the Work performed pursuant to the Contract Documents shall at all times and in all places be subject to the Contractor's sole direction, supervision and control.

9.10 The Contractor shall maintain adequate records to justify all charges, expenses, and costs incurred in estimating and performing the Work for at least five (5) years after final payment is made. The Owner shall have access to such books, records, and documents as required for the purpose of inspection or audit during normal business hours at the Contractor's place of business. Under no circumstances will Contractor be required to disclose any confidential or proprietary information regarding its products and service costs.

9.11 The Contract Documents shall not be construed more strongly against either party regardless of who was more responsible for its preparation.

9.12 Contractor shall comply with Florida's Public Records Laws, and specifically agrees to:

a) Keep and maintain public records that ordinarily and necessarily would be required by the Owner in order to perform the service.

b) Provide the public with access to public records on the same terms and conditions that the Owner would provide the records and at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.

c) Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law.

d) Meet all requirements for retaining public records and transfer, at no cost, to the Owner all public records in possession of the Contractor upon termination of the Contract Documents and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the Owner in a format that is compatible with the information technology systems of the Owner.

ARTICLE 10. INDEMNIFICATION.

10.1. Contractor shall indemnify and hold harmless Owner and Engineer and their respective officers, and employees for liabilities, damages, losses, and costs, including but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Contractor and persons employed or utilized by the Contractor in the performance of the construction contract.

10.2. It is the specific intent of the parties hereto that the foregoing indemnification complies with section 725.06, Florida Statutes. It is further the specific intent and agreement of the parties that all of the Contract Documents on this Project are hereby amended to include the foregoing indemnification and the "Specific Consideration" therefore.

10.3 Nothing in the Contract Documents shall be construed or interpreted as consent by the OWNER to be sued, nor as a waiver of sovereign immunity beyond the waiver or limits provided in section 768.28, Florida Statutes.

REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK
SIGNATURE PAGE FOLLOWS

IN WITNESS WHEREOF, OWNER AND CONTRACTOR have signed this Agreement in four parts. Two counterparts have been delivered to OWNER, and one counterpart each to CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by ENGINEER on their behalf.

CITY OF LAKE WORTH, FLORIDA

By: _____
Pam Triolo, Mayor

ATTEST

_____
Pamela J. Lopez, City Clerk

Approved as to form and legal sufficiency:

_____
Glen J. Torcivia, City Attorney

CONTRACTOR: _____

By: _____

Print Name: _____

Title: _____

[Corporate Seal]

STATE OF _____)
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 2015 by_____, as _____ of _____, Inc., a Florida corporation, and who is personally known to me or who has produced the following _____ as identification.

Notary Public:

_____

PROJECT: Water Treatment Plant
High Service Pump Improvements for
City of Lake Worth

00501
OPINION OF ATTORNEY

This is to certify that I have examined the attached Contract Documents, that after such examination I am of the opinion that the execution of the Agreement, the Performance Bond and Payment Bond are in due and proper form.

_____
Attorney for Owner

This the _____ day of _____, 20_____.

00610

Construction Performance Bond

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

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

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

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

CONTRACTOR AS PRINCIPAL
Company: (Corp. Seal)

Signature: _____
Name and Title:

SURETY
Company: (Corp. Seal)

Signature: _____
Name and Title:

CONTRACTOR AS PRINCIPAL
Company: (Corp. Seal)

Signature: _____
Name and Title:

SURETY
Company: (Corp. Seal)

Signature: _____
Name and Title:

EJCDC No. 1910-28A (1984 Edition)
Prepared through the joint efforts of The Surety Association of America, Engineers' Joint Contract Documents Committee, The Associated General Contractors of America, and the American Institute of Architects.

1. The Contractor and the 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 to participate in conferences as provided in Subparagraph 3.1.

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

3.1. The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below, that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. 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; and

3.2. The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1; and

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

4. 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:

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

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

4.3. 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 the contractor selected with the Owner's 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 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

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

1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or
2. Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen 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 Subparagraph 4.4, and the Owner refuses the payment tendered 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.

6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, 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. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

6.1. The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

6.2. Additional legal including appellate proceedings, design professional and delay costs and expenses resulting from the Contractor's default, and *

6.3. 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.

7. 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, or successors.

8. 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.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after 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 period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location 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. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1. Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of 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.

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

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

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

* resulting from the actions or failure to act of the Surety under Paragraph 4; and

This Bond is executed pursuant to Florida Statutes Section 255.05 or Section 713.23, whichever is applicable, and is subject to the notice and time limitation provisions.

(FOR INFORMATION ONLY—Name, Address and Telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE (~~Architect~~ Engineer ~~or other party~~):

Mock, Roos & Associates, Inc.
5720 Corporate Way
West Palm Beach, FL 33407

00620

Construction Payment Bond

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

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

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

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

CONTRACTOR AS PRINCIPAL
Company: (Corp. Seal)

Signature: _____
Name and Title:

SURETY
Company: (Corp. Seal)

Signature: _____
Name and Title:

CONTRACTOR AS PRINCIPAL
Company: (Corp. Seal)

Signature: _____
Name and Title:

SURETY
Company: (Corp. Seal)

Signature: _____
Name and Title:

(CDC No. 1910-28B (1984 Edition)
epared through the joint efforts of the Surety Association of America, Engineers' Joint Contract Documents Committee, The Associated eneral Contractors of America, American Institute of Architects, American Subcontractors Association, and the Associated Specialty ontractors.

1. The Contractor and the 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.

2. With respect to the Owner, this obligation shall be null and void if the Contractor:

2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2. Defends, indemnifies and holds harmless the Owner from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

4.1. Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim. (see Note 1)

4.2. Claimants who do not have a direct contract with the Contractor:

1. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

2. Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and

3. Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

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

6.1. Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2. Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. 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 the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. 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 payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. 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. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of 2 years from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2 (iii), 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.

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

13. When this Bond has been furnished to comply with a statutory 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. The intent is, that this Bond shall be construed as a statutory bond and not as a common law bond.

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

15. DEFINITIONS

15.1. 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 Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the 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.

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

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

Note 1: As an additional requirement any claimant, except a laborer, who is not in privity with the Contractor and who has not received payment for labor, materials or supplies shall, within forty-five days after beginning to furnish labor, materials or supplies, furnish the Contractor with a Notice that he intends to look to the Bond for protection.

This Bond is executed pursuant to Florida Statutes Section 255.05 or Section 713.23, whichever is applicable, and is subject to the notice and time limitation provisions.

(FOR INFORMATION ONLY—Name, Address and Telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):
Mock, Roos & Associates, Inc.
5720 Corporate Way
West Palm Beach, FL 33407

PROJECT: Water Treatment Plant
High Service Pump Improvements for
City of Lake Worth

SECTION 00630
NOTICE OF COMPLIANCE WITH CHAPTER 556, FLORIDA STATUTES

The undersigned Contractor does hereby confirm to the Owner and Engineer that the Contractor has reviewed the provisions of Chapter 556, Florida Statutes, and has provided to "Sunshine State One-Call of Florida, Inc." the information required under F.S. 556.105 before the commencement of any excavation or demolition required for the Work.

Executed this _____ day of _____, 20___.

_____
(name of Contractor)

_____
(signature)

_____
(print name)

_____
(title)

END OF SECTION

00670
CONTRACTOR'S AFFIDAVIT TO OWNER

STATE OF FLORIDA
COUNTY OF _____

Before me, the undersigned authority, authorized to administer oaths and take acknowledgements, personally appeared _____, who, being by me first duly sworn, on oath depose(s) and say(s):

(1) He/she is/They are a (Corporation, Partnership or Individual) of _____(State), doing business as _____(Company Name), hereinafter called "Contractor".

(2) Contractor heretofore entered into a Contract with _____ hereinafter called "Owner" to do Work (furnish material, labor and services) for the construction of _____, located at _____County, Florida. ".

(3) Contractor has fully completed construction in accordance with the terms of the Contract, and all lienors have been paid in full, except:

NAME OF LIENOR	AMOUNT DUE AND UNPAID
	$

(4) All Workmen's Compensation claims have been settled and no liability claims are pending, in connection with, arising out of or resulting from the Contract.

(5) Receipt by the Contractor of the final payment, under the aforementioned Contract, shall constitute a full release and discharge by the Contractor to the Owner of any and all claims of the Contractor against the Owner, arising out of, connected with, or resulting from performance of the obligations of the Contractor pursuant to the Contract Documents.

(6) The term "lienor" as used in this affidavit means any person having a lien or a prospective lien, under the Mechanics Lien Law of Florida, on the land and property of the Owner referred to in paragraph (2) of this affidavit..

(7) This affidavit is given pursuant to the provisions of Florida Statutes Section 713.06 or Section 255.05, whichever is applicable.

Signed and sealed in the presence of:

_____ _____
(ENTITY)

_____ By:_____
(SEAL)

Subscribed and Sworn to (or affirmed) before me on _____(date) by _____ _____(name). He/she is personally known to me or has presented _____(type of identification) as identification.

_____ _____
Notary Public Signature and Seal Print Notary Name and Commission No.

00680
APPLICATION FOR PAYMENT NO. _____

Project Water Treatment Plant High Service Pump Improvements for City of Lake Worth

Application is made for payment, as hereinafter shown, in connection with this Agreement:

Total Work to Date - see attached schedule	$ _____
Total Material Suitably Stored - see attached schedule	$ _____
Gross Amount Due	$ _____
Less _____ % Retainage	$ _____
Amount Due to Date	$ _____
Less Previous Applications	$ _____
Amount Due This Application	$ _____

Original Contract Price	$ _____
Net Change Orders	$ _____
Current Contract Price	$ _____
Value of Work Remaining to be Done	$ _____

Contractor's Certification:

The undersigned Contractor certifies that (1) all previous progress payments received from Owner on account of Work done under the Agreement referred to above have been applied to discharge in full all obligations of Contractor incurred in connection with Work covered by prior Applications for Payment numbered 1 through _____, inclusive; and (2) title to all materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all liens, claims, security interests and encumbrances (except such as covered by Bond acceptable to Owner).

Dated _____, 20___

_____
Contractor and Mailing Address

By _____
(Name and Title)

State of)
County of)ss

Subscribed and Sworn to (or affirmed) before me on _____ *(date)* personally appeared _____ *(name)*. He/she is personally known to me or has presented _____ _____ *(type of identification)* as identification. Who being so duly sworn, did depose and say that he/she is _____ of the Contractor above mentioned; that he/she executed the above Application for Payment and statement on behalf of said Contractor; and that all of the statements contained therein are true, correct and complete.

_____ _____
Notary Public Signature and Seal Print Notary Name and Commission No.

Payment of the above AMOUNT DUE THIS APPLICATION is recommended.

MOCK, ROOS & ASSOCIATES, INC.

Date: _____ By: _____
(Name) (Title)

CITY OF LAKE WORTH

Date: _____ By _____
(Name) (Title)

00681
SCHEDULE OF VALUES AND WORK COMPLETED

PROJECT TITLE_____

_____

CONTRACTOR _____

FOR PERIOD ENDING _____

TO ACCOMPANY APPLICATION NO. _____

ITEM	CONTRACTOR'S Schedule of Values			Work Completed	
	Unit Price	Quantity	Amount	Quantity	Amount
	$		$		$
NOTE: CONTRACTOR SHALL PREPARE APPROPRIATE SCHEDULE WITH ALL CONTRACT ITEMS					
SHOWN FOR ATTACHMENT TO EACH APPLICATION FOR PAYMENT.					
			Total (Original Contract)		$ _____
C.O. No. 1					
C.O. No. 1 NOTE: CHANGE ORDER(S) SHALL BE ITEMIZED AS APPLICABLE.					

TOTAL WORK TO DATE $_____

MATERIALS SUITABLY STORED

NOTE: CONTRACTOR TO ITEMIZE AND ATTACH APPROPRIATE INVOICES

TOTAL MATERIAL SUITABLY STORED $_____

Accompanying Documentation (Contractor to itemize):

This document has important legal consequences: consultation with an attorney is encouraged with respect to its completion or modification.

05/02/86
GC-1

00700

STANDARD

GENERAL CONDITIONS

OF THE

CONSTRUCTION CONTRACT

Prepared by

Engineers' Joint Contract Documents Committee

and

Issued and Published Jointly By

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

CONSTRUCTION SPECIFICATIONS INSTITUTE

This document has been approved and endorsed by

The Associated General Contractors of America

These General Conditions have been prepared for use with the Owner-Contractor Agreements (No. 1910-8-A-1 or 1910-8-A-2, 1983 editions). Their provisions are interrelated and a change in one may necessitate a change in the others. Comments concerning their usage are contained in the Commentary on Agreements for Engineering Services and Contract Documents, No. 1910-9, 1981 edition. For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. 1910-17, 1983 edition). When bidding is involved, the Standard Form of Instructions to Bidders (No. 1910-12, 1983 edition) may be used.

No. 1910-8 (1983 Edition)
Reprinted 8/85

TABLE OF CONTENTS OF GENERAL CONDITIONS

INDEX TO GENERAL CONDITIONS

Article or Paragraph Number

GENERAL CONDITIONS

ARTICLE 1—DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

Addenda—Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the bidding documents or the Contract Documents.

Agreement—The written agreement between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

Application for Payment—The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

Bid—The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

* BIDDER-(see ¶SC-1 of Supplementary Conditions)

Bonds—Bid, performance and payment bonds and other instruments of security.

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 Time, issued on or after the Effective Date of the Agreement.

Contract Documents—The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements issued pursuant to paragraphs 3.4 and 3.5 on or after the Effective Date of the Agreement.

Contract Price—The moneys payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).

Contract Time—The number of days (computed as provided in paragraph 17.2) or the date stated in the Agreement for the completion of the Work.

CONTRACTOR—The person, firm or corporation with whom OWNER has entered into the Agreement.

defective—An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or 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 14.8 or 14.10).

Drawings—The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents.

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.

ENGINEER—The person, firm or corporation named as such in the Agreement.

Field Order—A written order issued by ENGINEER which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Time.

General Requirements—Sections of Division 1 of the Specifications.

Laws and Regulations; Laws or Regulations—Laws, rules, regulations, ordinances, codes and/or orders.

Notice of Award—The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.

Notice to Proceed—A written notice given by OWNER to CONTRACTOR (with a copy to ENGINEER) fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR'S obligations under the Contract Documents.

OWNER—The public body or authority, corporation, association, firm or person with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided.

Partial Utilization—Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.

Project—The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

Resident Project Representative—The authorized representative of ENGINEER who is assigned to the site or any part thereof. (see ¶SC-1 of Supplementary Conditions) *

Shop Drawings—All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.

Specifications—Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

Subcontractor—An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

Substantial Completion—The Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER as evidenced by ENGINEER's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if there be no such certificate issued, when final payment is due in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

Supplementary Conditions—The part of the Contract Documents which amends or supplements these General Conditions.

Supplier—A manufacturer, fabricator, supplier, distributor, materialman or vendor.

Underground Facilities—All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work—Work to be paid for on the basis of unit prices.

Work—The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

Work Directive Change—A written directive 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 physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or to emergencies under paragraph 6.22. A Work Directive Change may not change the Contract Price or the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change 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 Time as provided in paragraph 10.2.

Written Amendment—A written amendment of the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly Work-related aspects of the Contract Documents.

ARTICLE 2—PRELIMINARY MATTERS

Delivery of Bonds:

2.1. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish in accordance with paragraph 5.1.

Copies of Documents:

2.2. OWNER shall furnish to CONTRACTOR up to ten copies (unless otherwise specified in the Supplementary Conditions) 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.

Commencement of Contract Time; Notice to Proceed:

2.3. The Contract Time 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 thirty days after the Effective Date of the Agreement. ~~In no event will the Contract Time commence to run later than the seventy-fifth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.~~ (See ¶SC-2.3 of Supplementary Conditions) *

Starting the Project:

2.4. CONTRACTOR shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

Before Starting Construction:

2.5. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown

thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

2.6. Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for review:

2.6.1. an estimated progress schedule indicating the starting and completion dates of the various stages of the Work;

2.6.2. a preliminary schedule of Shop Drawing submissions; and

2.6.3. a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by CONTRACTOR at the time of submission.

2.7. ~~Before any Work at the site is started, CONTRACTOR shall deliver to OWNER, with a copy to ENGINEER, certificates (and other evidence of insurance requested by OWNER) which CONTRACTOR is required to purchase and maintain in accordance with paragraphs 5.3 and 5.4, and OWNER shall deliver to CONTRACTOR certificates (and other evidence of insurance requested by CONTRACTOR) which OWNER is required to purchase and maintain in accordance with paragraphs 5.6 and 5.7.~~ (See ¶Sc-2.7 of * the Supplementary Conditions)

Preconstruction Conference:

2.8. Within twenty days after the Effective Date of the Agreement, but before CONTRACTOR starts the Work at the site, a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to discuss the schedules referred to in paragraph 2.6, to discuss procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work.

Finalizing Schedules:

2.9. At least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to finalize the schedules submitted in accordance with paragraph 2.6. The finalized progress schedule will be acceptable to ENGINEER as providing an orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on ENGINEER responsibility for the progress or scheduling of the Work nor relieve CONTRACTOR from full responsibility therefor. The finalized schedule of Shop Drawing submissions will be acceptable to ENGINEER as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to ENGINEER as to form and substance.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Intent:

3.1. The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.2. 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 Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest 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. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of ENGINEER's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in paragraph 9.4.

3.3. If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so report to ENGINEER in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification

from ENGINEER; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

Amending and Supplementing Contract Documents:

3.4. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

3.4.1. a formal Written Amendment,

3.4.2. a Change Order (pursuant to paragraph 10.4), or

3.4.3. a Work Directive Change (pursuant to paragraph 10.1).

As indicated in paragraphs 11.2 and 12.1, Contract Price and Contract Time may only be changed by a Change Order or a Written Amendment.

3.5. In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

3.5.1. a Field Order (pursuant to paragraph 9.5),

3.5.2. ENGINEER's approval of a Shop Drawing or sample (pursuant to paragraphs 6.26 and 6.27), or

3.5.3. ENGINEER's written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents:

3.6. Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER shall 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; and they shall not reuse any of them on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER.

ARTICLE 4—AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

Availability of Lands:

4.1. OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and pai for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR believes that any delay in OWNER's furnishing these lands, rights-of-way or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Article 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

Physical Conditions: (see ¶SC 4.2.1 of the Supplementary Conditions) *

4.2.1. *Explorations and Reports:* ~~Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, but not upon nontechnical data, interpretations or opinions contained therein or for the completeness thereof for CONTRACTOR's purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.~~

4.2.2. *Existing Structures:* ~~Reference is made to the Supplementary Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3) which are at or contiguous to the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for CONTRACTOR's purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to physical conditions in or relating to such structures.~~

4.2.3. *Report of Differing Conditions:* If CONTRACTOR believes that:

4.2.3.1. any technical data on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2. any physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents,

CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.22), notify OWNER and ENGINEER in writing about the inaccuracy or difference.

4.2.4. *ENGINEER's Review:* ENGINEER will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

4.2.5. *Possible Document Change:* If ENGINEER concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change in the Contract Documents is required, a Work Directive Change or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6. *Possible Price and Time Adjustments:* In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference. If OWNER and CONTRACTOR are unable to agree as to the amount or length thereof, a claim may be made therefor as provided in Articles 11 and 12.

Physical Conditions—Underground Facilities:

4.3.1. *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 or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

4.3.1.1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and,

4.3.1.2. CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Facilities shown or indicated in the Contract Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for the safety and protection thereof as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.2. *Not Shown or Indicated.* If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.22), identify the owner of such Underground Facility and give written notice thereof to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount or length thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

Reference Points:

4.4. 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 (unless otherwise specified in the General Requirements), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point 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 by professionally qualified personnel.

ARTICLE 5—BONDS AND INSURANCE

Performance and Other Bonds:

5.1. 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 CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as otherwise provided by Law or Regulation or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by Law or Regulation or by the Contract Documents and be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act. **(See SC-5.1 of the Supplementary Conditions)**

5.2. If the surety on any Bond furnished by CONTRACTOR is declared a 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 5.1, CONTRACTOR shall within five days thereafter substitute another Bond and Surety, both of which must be acceptable to OWNER.

* ***Contractor's Liability Insurance:*** (See ¶SC-5.3 of the Supplementary Conditions)

5.3. CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance as is appropriate for the Work being performed and furnished and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance and furnishing of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed or furnished by CONTRACTOR, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

5.3.1. Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts;

5.3.2. Claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;

5.3.3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;

5.3.4. Claims for damages insured by 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;

5.3.5. 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;

5.3.6. Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and

5.3.7. 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.

The insurance required by this paragraph 5.3 shall include the specific coverages and be written for not less than the limits of liability and coverages provided in the Supplementary Conditions, or required by law, whichever is greater. The comprehensive general liability insurance shall include completed operations insurance. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be cancelled, materially changed or renewal refused until at least thirty days' prior written notice has been given to OWNER and ENGINEER by certified mail. All such insurance shall remain in effect until final payment and at all times thereafter when CONTRACTOR may be correcting, removing or replacing *defective* Work in accordance with paragraph 13.12. In addition, CONTRACTOR shall maintain such completed operations insurance for at least two years after final payment and furnish OWNER with evidence of continuation of such insurance at final payment and one year thereafter.

Contractual Liability Insurance: (See ¶SC-5.4 of the Supplementary Conditions) *

5.4. The comprehensive general liability insurance required by paragraph 5.3 will include contractual liability insurance applicable to CONTRACTOR's obligations under paragraphs 6.30 and 6.31.

Owner's Liability Insurance: (See ¶SC-5.5 of the Supplementary Conditions) *

~~5.5. OWNER shall be responsible for purchasing and maintaining OWNER's own liability insurance and, at OWNER's option, may purchase and maintain such insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.~~

Property Insurance: (See ¶SC-5.6 thru 5.10 of the Supplementary Conditions) *

5.6. ~~Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER and ENGINEER's consultants in the Work, all of whom shall be listed as insureds or additional insured parties, shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be provided in the Supplementary Conditions, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). If not covered under the "all risk" insurance or otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment.~~

5.7. ~~OWNER shall purchase and maintain such boiler and machinery 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, ENGINEER AND ENGINEER's consultants in the Work, all of whom shall be listed as insured or additional insured parties.~~

5.8. All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by OWNER in accordance with paragraphs 5.6 and 5.7 will contain a provision or endorsement that the coverage afforded will not be cancelled or materially changed or renewal refused until at least thirty days' prior written notice has been given to CONTRACTOR by certified mail and will contain waiver provisions in accordance with paragraph 5.11.2.

5.9. OWNER shall not be responsible for purchasing and maintaining any property insurance to protect the interests of CONTRACTOR, Subcontractors or others in the Work to the extent of any deductible amounts that are provided in the Supplementary Conditions. The risk of loss within the deductible amount, will be borne by CONTRACTOR, Subcontractor 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.

5.10. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policy, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. 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.

Waiver of Rights:

5.11.1. OWNER and CONTRACTOR waive all rights against each other for all losses and damages caused by any of the perils covered by the policies of insurance provided in response to paragraphs 5.6 and 5.7 and any other property insurance applicable to the Work, and also waive all such rights against the Subcontractors, ENGINEER, ENGINEER's consultants and all other parties named as insureds in such policies for losses and damages so caused. As required by paragraph 6.11, each subcontract between CONTRACTOR and a Subcontractor will contain similar waiver provisions by the Subcontractor in favor of OWNER, CONTRACTOR, ENGINEER, ENGINEER's consultants and all other parties named as insureds. None of the above waivers shall extend to the rights that any of the insured parties may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

5.11.2. OWNER and CONTRACTOR intend that any policies provided in response to paragraphs 5.6 and 5.7 shall protect all of the parties insured and provide primary coverage for all losses and damages caused by the perils covered thereby. Accordingly, all such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any of the parties named as insureds or additional insureds, and if the insurers require separate waiver forms to be signed by ENGINEER or ENGINEER's consultant OWNER will obtain the same, and if such waiver forms are required of any Subcontractor, CONTRACTOR will obtain the same.

Receipt and Application of Proceeds:

5.12. Any insured loss under the policies of insurance required by paragraphs 5.6 and 5.7 will be adjusted with OWNER and made payable to OWNER as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.13. 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 or Written Amendment.

5.13. OWNER as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, OWNER as trustee shall, upon the occurrence of an insured loss, give bond for the proper performance of such duties.

Acceptance of Insurance: (See ¶SC-5.14 of the Supplementary Conditions) *

5.14. If OWNER has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by CONTRACTOR in accordance with paragraphs 5.3 and 5.4 on the basis of its not complying with the Contract Documents, OWNER shall notify CONTRACTOR in writing thereof within ten days of the date of delivery of such certificates to OWNER in accordance with paragraph 2.7. If CONTRACTOR has any objection to the coverage afforded by or other provisions of the policies of insurance required to be purchased and maintained by OWNER in accordance with paragraphs 5.6 and 5.7 on the basis of their not complying with the Contract Documents, CONTRACTOR shall notify OWNER in writing thereof within ten days of the date of delivery of such certificates to CONTRACTOR in accordance with paragraph 2.7. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided by each as the other may reasonably request. Failure by OWNER or CONTRACTOR to give any such notice of objection within the time provided shall constitute acceptance of such insurance purchased by the other as complying with the Contract Documents.

Partial Utilization—Property Insurance:

5.15. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with paragraph 14.10; provided that no

such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected the 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 cancelled or lapse on account of any such partial use or occupancy.

ARTICLE 6—CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

6.1. CONTRACTOR shall supervise 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, but CONTRACTOR shall not be responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.

6.2. CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

Labor, Materials and Equipment:

6.3. 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. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER's written consent given after prior written notice to ENGINEER.

6.4. Unless otherwise specified in the General Requirements, CONTRACTOR shall furnish and assume full responsibility for all 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 furnishing, performance, testing, start-up and completion of the Work.

6.5. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to ENGINEER, or any of ENGINEER's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

Adjusting Progress Schedule:

6.6. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.9) adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

Substitutes or "Or-Equal" Items:

6.7.1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by ENGINEER if sufficient information is submitted by CONTRACTOR to allow ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named. The procedure for review by ENGINEER will include the following as supplemented in the General Requirements. Requests for review of substitute items of material and equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not acceptance of the substitute for use 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 work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or

royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish at CONTRACTOR's expense additional data about the proposed substitute.

6.7.2. If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to ENGINEER, if CONTRACTOR submits sufficient information to allow ENGINEER to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in paragraph 6.7.1 as applied by ENGINEER and as may be supplemented in the General Requirements.

6.7.3. ENGINEER will be allowed a reasonable time within which to evaluate each proposed substitute. ENGINEER will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without ENGINEER's prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute. ENGINEER will record time required by ENGINEER and ENGINEER's consultants in evaluating substitutions proposed by CONTRACTOR and in making changes in the Contract Documents occasioned thereby. Whether or not ENGINEER accepts a proposed substitute, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's consultants for evaluating each proposed substitute.

Concerning Subcontractors, Suppliers and Others:

6.8.1. CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to OWNER and ENGINEER as indicated in paragraph 6.8.2), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

6.8.2. If the 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 and 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 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, the Contract Price will be increased by the difference in the cost occasioned by such substitution and an appropriate Change Order will be issued or Written Amendment signed. 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.

6.8.3. (See ¶SC-6.8.3 of the Supplementary Conditions) *

6.9. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other person or organization, nor shall it 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 person or organization except as may otherwise be required by Laws and Regulations. (See ¶SC-6.9 of the Supplementary Conditions) *

6.10. 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.

6.11. All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER and contains waiver provisions as required by paragraph 5.11. CONTRACTOR shall pay each Subcontractor a just share of any insurance moneys received by CONTRACTOR on account of losses under policies issued pursuant to paragraphs 5.6 and 5.7.

Patent Fees and Royalties:

6.12. 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. CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees and court and arbitration costs) arising out of 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, and shall defend all such claims in connection with any alleged infringement of such rights.

Permits:

6.13. 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. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as
* plant investment fees. (See ¶6.13 of the Supplementary Conditions)

Laws and Regulations:

6.14.1. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and 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.

6.14.2. If CONTRACTOR observes that the Specifications or Drawings are at variance with any Laws or Regulations, CONTRACTOR shall give ENGINEER prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Laws or Regulations, and without such notice to ENGINEER, CONTRACTOR shall bear all costs arising therefrom; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

Taxes:

6.15. 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.

Use of Premises:

6.16. CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises 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 land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against OWNER or ENGINEER by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER and ENGINEER harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against OWNER or ENGINEER to the extent based on a claim arising out of CONTRACTOR's performance of the Work.

6.17. During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.

6.18. 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.

Record Documents:

6.19. CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Directive Changes, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all 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 com-

pletion of the Work, these record documents, samples and Shop Drawings will be delivered to ENGINEER for OWNER.

Safety and Protection:

6.20. CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

6.20.1. all employees on the Work and other persons and organizations who may be affected thereby;

6.20.2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3. 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.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for the safety of persons or property or to protect them 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 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. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish 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 either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR). CONTRACTOR's duties and responsibilities for the safety and 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 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.21. CONTRACTOR shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be CONTRACTOR's superintendent unless otherwise designated in writing by CONTRACTOR to OWNER.

Emergencies:

6.22. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER or OWNER, 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. If ENGINEER determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variations.

Shop Drawings and Samples:

6.23. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, CONTRACTOR shall submit to ENGINEER for review and approval in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.9), or for other appropriate action if so indicated in the Supplementary Conditions, five copies (unless otherwise specified in the General Requirements) of all Shop Drawings, which will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable ENGINEER to review the information as required.

6.24. CONTRACTOR shall also submit to ENGINEER for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

6.25.1. Before submission of each Shop Drawing or sample CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

6.25.2. At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on

each Shop Drawing submitted to ENGINEER for review and approval of each such variation.

6.26. ENGINEER will review and approve with reasonable promptness Shop Drawings and samples, but ENGINEER's review and approval will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required 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. 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.

6.27. ENGINEER's review and approval of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of submission as required by paragraph 6.25.2 and ENGINEER has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.25.1.

6.28. Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to ENGINEER's review and approval of the pertinent submission will be the sole expense and responsibility of CONTRACTOR.

Continuing the Work:

6.29. 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 15.5 or as CONTRACTOR and OWNER may otherwise agree in writing.

See Paragraph SC-6.30 of the Supplementary Conditions

Indemnification:

6.30. ~~To the fullest extent permitted by Laws and Regulations CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (a) 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 and (b) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder or arises by or is imposed by Law and Regulations regardless of the negligence of any such party.~~

See Paragraph SC-6.31 of the Supplementary Conditions

6.31. ~~In any and all claims against OWNER or ENGINEER or any of their consultants, agents or employees by any employee of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.30 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 or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.~~

6.32. The obligations of CONTRACTOR under paragraph 6.30 shall not extend to the liability of ENGINEER, ENGINEER's consultants, agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications.

ARTICLE 7—OTHER WORK

Related Work at Site:

7.1. OWNER may perform other work related to the Project at the site by OWNER's own forces, have other work performed by utility owners or let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other work; and, if CONTRACTOR believes that such performance will involve additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

7.2. CONTRACTOR shall afford each utility owner and other contractor who is a party to such a direct contract (or OWNER, if OWNER is performing the additional work with OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs. CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CON-

TRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their 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.

7.3. If any part of CONTRACTOR's Work depends for proper execution or results upon the work of any such other contractor or utility owner (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. CONTRACTOR's failure so to report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR's Work except for latent or non-apparent defects and deficiencies in the other work.

Coordination:

7.4. If OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither OWNER nor ENGINEER shall have any authority or responsibility in respect of such coordination.

ARTICLE 8—OWNER'S RESPONSIBILITIES

8.1. OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.2. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer against whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER. Any dispute in connection with such appointment shall be subject to arbitration.

8.3. OWNER shall furnish the data required of OWNER under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in paragraphs 14.4 and 14.13.

8.4. OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by ENGINEER in preparing the Drawings and Specifications.

8.5. OWNER's responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.5 through 5.8.

8.6. OWNER is obligated to execute Change Orders as indicated in paragraph 10.4.

8.7. OWNER's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.4.

8.8. In connection with OWNER's right to stop Work or suspend Work, see paragraphs 13.10 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.

ARTICLE 9—ENGINEER'S STATUS DURING CONSTRUCTION

Owner's Representative:

9.1. 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 and shall not be extended without written consent of OWNER and ENGINEER.

Visits to Site:

9.2. ENGINEER will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous on-site inspections 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 to the Contract Documents. On the basis of such visits and on-site observations as an experienced and qualified design professional, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defects and deficiencies in the Work.

Project Representation:

9.3. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions. If OWNER designates another agent to represent OWNER at the site who is not ENGINEER's agent or employee, the duties, responsibilities and limitations of authority of such other person will be as provided in the Supplementary Conditions.

9.3.1. (See ¶SC-9.3.1 of the Supplementary Conditions) *

Clarifications and Interpretations:

9.4. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification or interpretation justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Article 11 or Article 12.

Authorized Variations in Work:

9.5. 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 Time and are consistent with the overall intent of 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 CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Article 11 or 12.

Rejecting Defective Work:

9.6. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be *defective*, and will also have authority to require special inspection or testing of the Work as provided in paragraph 13.9, whether or not the Work is fabricated, installed or completed. **(See SC-9.6 of the Supplementary Conditions)**

Shop Drawings, Change Orders and Payments:

9.7. In connection with ENGINEER's responsibility for Shop Drawings and samples, see paragraphs 6.23 through 6.29 inclusive.

9.8. In connection with ENGINEER's responsibilities as to Change Orders, see Articles 10, 11 and 12.

9.9. In connection with ENGINEER's responsibilities in respect of Applications for Payment, etc., see Article 14.

Determinations for Unit Prices:

9.10. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR 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 decisions thereon will be final and binding upon OWNER and CONTRACTOR, unless, within ten days after the date of any such decision, either OWNER or CONTRACTOR delivers to the other party to the Agreement and to ENGINEER written notice of intention to appeal from such a decision.

Decisions on Disputes:

9.11. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract Time will be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this paragraph, which ENGINEER will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered by the claimant to ENGINEER and the other party to the Agreement promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within sixty days after such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim.

9.12. When functioning as interpreter and judge under paragraphs 9.10 and 9.11, 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. The rendering of a decision by ENGINEER pursuant to paragraphs 9.10 and 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.16) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute or other matter.

Limitations on ENGINEER's Responsibilities:

9.13. Neither ENGINEER's authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

9.14. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be

effective to assign to ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

9.15. ENGINEER will not be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and ENGINEER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

9.16. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

ARTICLE 10—CHANGES IN THE WORK

10.1. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Written Amendment, a Change Order, or a Work Directive Change. 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).

10.2. If OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Work Directive Change, a claim may be made therefor as provided in Article 11 or Article 12.

10.3. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.4 and 3.5, except in the case of an emergency as provided in paragraph 6.22 and except in the case of uncovering Work as provided in paragraph 13.9.

10.4. OWNER and CONTRACTOR shall execute appropriate Change Orders (or Written Amendments) covering:

10.4.1. changes in the Work which are ordered by OWNER pursuant to paragraph 10.1, are required because of acceptance of *defective* Work under paragraph 13.13 or correcting *defective* Work under paragraph 13.14, or are agreed to by the parties;

10.4.2. changes in the Contract Price or Contract Time which are agreed to by the parties; and

10.4.3. changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 9.11;

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 6.29.

10.5. If notice 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 Time) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 11—CHANGE OF CONTRACT PRICE

11.1. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

11.2. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

11.3. The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

11.3.1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1. through 11.9.3, inclusive).

11.3.2. By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2.1).

11.3.3. On the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a CONTRACTOR's Fee for overhead and profit (determined as provided in paragraphs 11.6 and 11.7).

Cost of the Work:

11.4. The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. 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 include only the following items and shall not include any of the costs itemized in paragraph 11.5:

11.4.1. 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. 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' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by OWNER.

11.4.2. 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 all returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

11.4.3. Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids will be accepted. If a 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 shall be determined in the same manner as CONTRACTOR's Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

11.4.4. 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.

11.4.5. Supplemental costs including the following:

11.4.5.1. The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

11.4.5.2. 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.

11.4.5.3. 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, installation, dismantling and removal thereof—all in accordance with 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.

11.4.5.4. Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

11.4.5.5. 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.

11.4.5.6. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by OWNER in accordance with paragraph 5.9), provided they 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. If, however, any such loss or damage

requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraph 11.6.2.

11.4.5.7. The cost of utilities, fuel and sanitary facilities at the site.

11.4.5.8. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

11.4.5.9. Cost of premiums for additional Bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by OWNER in accordance with paragraph 5.9.

11.5. The term Cost of the Work shall not include any of the following:

11.5.1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by paragraph 11.4.4—all of which are to be considered administrative costs covered by the CONTRACTOR's Fee.

11.5.2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.

11.5.3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR'S capital employed for the Work and charges against CONTRACTOR for delinquent payments.

11.5.4. Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 11.4.5.9 above).

11.5.5. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of *defective* Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

11.5.6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

CONTRACTOR's Fee:

11.6. The CONTRACTOR's Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

11.6.1. a mutually acceptable fixed fee; or if none can be agreed upon,

11.6.2. a fee based on the following percentages of the various portions of the Cost of the Work:

11.6.2.1. for costs incurred under paragraphs 11.4.1 and 11.4.2, the CONTRACTOR's Fee shall be fifteen percent;

11.6.2.2. for costs incurred under paragraph 11.4.3, the CONTRACTOR's Fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors shall be fifteen percent;

11.6.2.3. no fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5 and 11.5;

11.6.2.4. the amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR's Fee by an amount equal to ten percent of the net decrease; and

11.6.2.5. 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 11.6.2.1 through 11.6.2.4, inclusive.

11.7. Whenever the cost of any Work is to be determined pursuant to paragraph 11.4 or 11.5, CONTRACTOR will submit in form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

Cash Allowances:

11.8. 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 done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to ENGINEER. CONTRACTOR agrees that:

11.8.1. The 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

11.8.2. CONTRACTOR's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the

allowances. No demand for additional payment on account of any thereof will be valid.

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.

Unit Price Work:

11.9.1. 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 established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. 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 in accordance with Paragraph 9.10.

11.9.2. 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.

11.9.3. ~~Where 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 there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR believes that CONTRACTOR has incurred additional expense as a result thereof, CONTRACTOR may make a claim for an increase in the Contract Price in accordance with Article 11 if the parties are unable to agree as to the amount of any such increase.~~

* (See ¶SC-11.9.3 of the Supplementary Conditions

ARTICLE 12—CHANGE OF CONTRACT TIME

12.1. The Contract Time may only be changed by a Change Order or a Written Amendment. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2. The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if a claim is made therefor as provided in paragraph 12.1. Such delays shall include, but not be limited to, acts or neglect by OWNER or others performing additional work as contemplated by Article 7, or to fires, floods, labor disputes, epidemics, abnormal weather conditions or acts of God.

12.3. All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 12 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) for delay by either party.

ARTICLE 13—WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

Warranty and Guarantee:

13.1. CONTRACTOR warrants and guarantees to OWNER and ENGINEER that all Work will be in accordance with the Contract Documents and will not be *defective*. ~~Prompt notice of all defects shall be given to CONTRACTOR~~. All *defective* Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article 13.

*See ¶SC-13.1 of the Supplementary Conditions. *

Access to Work:

13.2. ENGINEER and ENGINEER's representatives, other representatives of OWNER, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

Tests and Inspections:

13.3. ~~CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals.~~ See ¶SC-13.3 of the Supplementary Conditions. *

13.4. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, CONTRACTOR shall assume full responsibility therefor, pay all costs in connection therewith and furnish ENGINEER the required certificates of inspection, testing or approval. CONTRACTOR shall also

be responsible for and shall pay all costs in connection with any inspection or testing required in connection with OWNER's or ENGINEER's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. The cost of all inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by OWNER (unless otherwise specified).

13.5. All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to OWNER and CONTRACTOR (or by ENGINEER if so specified).

13.6. If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation. Such uncovering 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.

13.7. Neither observations by ENGINEER nor inspections, tests or approvals by others shall relieve CONTRACTOR from CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.

Uncovering Work:

13.8. 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.

13.9. 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. If it is found that such Work is *defective,* CONTRACTOR shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals), and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefor as provided in Article 11. If, however, such Work is not found to be *defective,* CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

Owner May Stop the Work:

13.10. If the Work is *defective,* or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or 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 or any other party.

Correction or Removal of Defective Work:

13.11. If required by ENGINEER, CONTRACTOR shall promptly, as directed, either correct all *defective* Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by ENGINEER, remove it from the site and replace it with *nondefective* Work. CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

One Year Correction Period:

13.12. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or 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,* CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions, either correct such *defective* Work, or, if it has been rejected by OWNER, remove it from the site and replace it with *nondefective* Work. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the *defective* Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by CONTRACTOR. 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 or by Written Amendment.

(See SC-13.12 of the Supplementary Conditions)

Acceptance of Defective Work:

13.13. If, instead of requiring correction or removal and replacement of *defective* Work, OWNER (and, prior to ENGINEER's recommendation of final payment, also ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall bear all direct, indirect and consequential

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 to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). 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, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

OWNER May Correct Defective Work:

13.14. If CONTRACTOR fails within a reasonable time after written notice of ENGINEER to proceed to correct and to correct *defective* Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.11, 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 and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. To the extent necessary to complete corrective and 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 such access to the site as may be necessary to enable OWNER to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of OWNER in exercising such rights and remedies will be charged against CONTRACTOR in an amount approved as to reasonableness by ENGINEER, 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, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR's *defective* Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

ARTICLE 14—PAYMENTS TO CONTRACTOR AND COMPLETION

Schedule of Values:

14.1. The schedule of values established as provided in paragraph 2.9 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.

Application for Progress Payment:

14.2. At least twenty days before each progress payment is scheduled (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, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER's interest therein, all of which will be satisfactory to OWNER. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

CONTRACTOR's Warranty of Title:

14.3. 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.

Review of Applications for Progress Payment:

14.4. ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to 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. Ten days after presentation of the Application for Payment with ENGINEER's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by OWNER to CONTRACTOR.

14.5. ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a

representation by ENGINEER to OWNER, based on ENGINEER's on-site observations of the Work in progress as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that, to the best of ENGINEER's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10, and to any other qualifications stated in the recommendation); and that CONTRACTOR is entitled to payment of the amount recommended. However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents or that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or OWNER to withhold payment to CONTRACTOR.

14.6. ENGINEER's recommendation of final payment will constitute an additional representation by ENGINEER to OWNER that the conditions precedent to CONTRACTOR's being entitled to final payment as set forth in paragraph 14.13 have been fulfilled.

14.7. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make such representations to OWNER. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

14.7.1. the Work is *defective,* or completed Work has been damaged requiring correction or replacement,

14.7.2. the Contract Price has been reduced by Written Amendment or Change Order,

14.7.3. OWNER has been required to correct *defective* Work or complete Work in accordance with paragraph 13.14, or

14.7.4. of ENGINEER's actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.9 inclusive.

OWNER may refuse to make payment of the full amount recommended by ENGINEER because claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work or Liens have been filed in connection with the Work or there are other items entitling OWNER to a set-off against the amount recommended, but OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action.

Substantial Completion:

14.8. 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. Within a reasonable time thereafter, 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. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and 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 fourteen 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 fourteen 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. 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, maintenance, heat, utilities, insurance and warranties. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER 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.

14.9. OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

Partial Utilization:

14.10. Use by OWNER of any finished part of the Work, which has specifically been identified in the Contract Docu-

ments, or which OWNER, ENGINEER and CONTRACTOR agree constitutes a separately functioning and useable part of the Work that can be used by OWNER without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

14.10.1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees, CONTRACTOR will certify to OWNER and ENGINEER that said part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. 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. 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 paragraphs 14.8 and 14.9 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.

14.10.2. OWNER may at any time request CONTRACTOR in writing to permit OWNER to take over operation of any such part of the Work although it is not substantially complete. A copy of such request will be sent to ENGINEER and within a reasonable time thereafter OWNER, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If CONTRACTOR does not object in writing to OWNER and ENGINEER that such part of the Work is not ready for separate operation by OWNER, ENGINEER will finalize the list of items to be completed or corrected and will deliver such list to OWNER and CONTRACTOR together with a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that part of the Work which will become binding upon OWNER and CONTRACTOR at the time when OWNER takes over such operation (unless they shall have otherwise agreed in writing and so informed ENGINEER). During such operation and prior to Substantial Completion of such part of the Work, OWNER shall allow CONTRACTOR reasonable access to complete or correct items on said list and to complete other related Work.

14.10.3. No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of paragraph 5.15 in respect of property insurance.

Final Inspection:

14.11. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will 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 remedy such deficiencies.

Final Application for Payment:

14.12. After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents—all as required by the Contract Documents, and after ENGINEER has indicated that the Work is acceptable (subject to the provisions of paragraph 14.16), CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

Final Payment and Acceptance:

14.13. 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—all 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 to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.16.

Otherwise, ENGINEER will return the Application 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. Thirty days after presentation to OWNER of the Application and accompanying documentation, in appropriate form and substance, and with ENGINEER's recommendation and notice of acceptability, the amount recommended by ENGINEER will become due and will be paid by OWNER to CONTRACTOR. **(See SC-14.13 of the Supplementary Conditions)**

14.14. 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 and recommendation of ENGINEER, and without terminating the Agreement, 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 5.1, 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.

Contractor's Continuing Obligation:

14.15. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13, nor any correction of *defective* Work by OWNER will constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents (except as provided in paragraph 14.16).

Waiver of Claims:

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

14.16.1. 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 14.11 or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by OWNER of any rights in respect of CONTRACTOR's continuing obligations under the Contract Documents; and

14.16.2. a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

ARTICLE 15—SUSPENSION OF WORK AND TERMINATION

Owner May Suspend Work:

15.1. OWNER may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety 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 allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

Owner May Terminate:

15.2. Upon the occurrence of any one or more of the following events:

15.2.1. if CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency;

15.2.2. if a petition is filed against CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

15.2.3. if CONTRACTOR makes a general assignment for the benefit of creditors;

15.2.4. if a trustee, receiver, custodian or agent of CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR's creditors;

15.2.5. if CONTRACTOR admits in writing an inability to pay its debts generally as they become due;

15.2.6. if CONTRACTOR persistently fails 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 2.9 as revised from time to time);

15.2.7. if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

15.2.8. if CONTRACTOR disregards the authority of ENGINEER; or

15.2.9. if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety, if there be one) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, 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), 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 finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) such excess will be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER will be approved as to reasonableness by ENGINEER and incorporated in a Change Order, but when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

15.3. 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.

15.4. Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs). **(See SC-15.4 of the Supplementary Conditions)**

Contractor May Stop Work or Terminate:

15.5. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty days after it is submitted, or OWNER fails for thirty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and ENGINEER, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if ENGINEER has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve CONTRACTOR of the obligations under paragraph 6.29 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with OWNER.

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ARTICLE 16—ARBITRATION

16.1. All claims, disputes and other matters in question between OWNER and CONTRACTOR arising out of, or relating to the Contract Documents or the breach thereof (except for claims which have been waived by the making or acceptance of final payment as provided by paragraph 14.16) will be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining subject to the limitations of this Article 16. This agreement so to arbitrate and any other agreement or consent to arbitrate entered into in accordance herewith as provided in this Article 16 will be specifically enforceable under the prevailing law of any court having jurisdiction.

16.2. No demand for arbitration of any claim, dispute or other matter that is required to be referred to ENGINEER initially for decision in accordance with paragraph 9.11 will be made until the earlier of (a) the date on which ENGINEER has rendered a decision or (b) the tenth day after the parties have presented their evidence to ENGINEER if a written decision has not been rendered by ENGINEER before that date. No demand for arbitration of any such claim, dispute or other matter will be made later than thirty days after the date on which ENGINEER has rendered a written decision in respect thereof in accordance with paragraph 9.11; and the failure to demand arbitration within said thirty days' period shall result in ENGINEER's decision being final and binding upon OWNER and CONTRACTOR. If ENGINEER renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned. No demand for arbitration of any written decision of ENGINEER rendered in accordance with paragraph 9.10 will be made later than ten days after the party making such demand has delivered written notice of intention to appeal as provided in paragraph 9.10.

16.3. Notice of the demand for arbitration will be filed in writing with the other party to the Agreement and with the American Arbitration Association, and a copy will be sent to ENGINEER for information. The demand for arbitration will be made within the thirty-day or ten-day period specified in paragraph 16.2 as applicable, and in all other cases within a reasonable time after the claim, dispute or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

16.4. No arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder or in any other manner any other person or entity (including ENGINEER, ENGINEER's agents, employees or consultants) who is not a party to this contract unless:

16.4.1. the inclusion of such other person or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration,

16.4.2. such other person or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings, and

16.4.3. the written consent of the other person or entity sought to be included and of OWNER and CONTRACTOR has been obtained for such inclusion, which consent shall make specific reference to this paragraph; but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.

16.5. The award rendered by the arbitrators will be final, judgment may be entered upon it in any court having jurisdiction thereof, and will not be subject to modification or appeal except to the extent permitted by Sections 10 and 11 of the Federal Arbitration Act (9 U.S.C. §§10,11).

*(See ¶SC-16 of the Supplementary Conditions)

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ARTICLE 17—MISCELLANEOUS

Giving Notice:

17.1. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if 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 if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

Computation of Time:

17.2.1. 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.

17.2.2. A calendar day of twenty-four hours measured from midnight to the next midnight shall constitute a day.

General:

17.3. Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 17.3 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

17.4. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by paragraphs 6.30, 13.1, 13.12, 13.14, 14.3 and 15.2 and all of the rights and remedies available to OWNER and ENGINEER thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

(See Article 18 - SC-18.1 through SC-18.11 of the Supplementary Conditions)

(See SC-19 of the Supplementary Conditions)

00800
SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC No. 1910-8, 1983 edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect. The General Conditions may also be supplemented elsewhere in the Contract Documents.

The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (EJCDC No. 1910-8, 1983, edition) have the meanings assigned to them in the General Conditions.

PART 1 - MODIFICATIONS AND SUPPLEMENTS TO GENERAL CONDITIONS

SC-1

Add the following to Article 1 - Definitions of the General Conditions:

Bidder -Any individual, partnership, corporation or joint venture submitting a Bid for the Work to be performed.

Resident Project Representative - The Resident Project Representative (RPR) may be assigned to the site or any part thereof on a full time basis or only on a part-time basis. This will be determined by Engineer's Agreement with Owner.

COMMENCEMENT OF CONTRACT TIME; NOTICE TO PROCEED:

SC-2.3

Delete the last sentence of paragraph 2.3. of the General Conditions and insert the following in its place:

In no event will the Contract Time commence to run later than the 120th day after the date of the Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier, (unless agreed otherwise by Owner and Contractor in writing).

BEFORE STARTING CONSTRUCTION:

SC-2.7

Delete paragraph 2.7. of the General Conditions in its entirety and insert the following in its place:

Before any Work at the site is started, Contractor shall deliver to Owner and Engineer certificates (and other evidence of insurance requested by Owner) which Contractor is required to purchase and maintain in accordance with the Contract Documents.

PHYSICAL CONDITIONS:

SC-4.2.1.

Delete paragraphs 4.2.1 and 4.2.2 of the General Conditions in their entirety and insert the following in their place:

4.2.1. Explorations and Reports: Reference is made to Division 1: General Requirements of the Specifications for the identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by Engineer in preparation of the Contract Documents. Contractor may rely upon the accuracy of any technical data contained in such reports that is specifically

referenced in Division 1: General Requirements as technical data that can be relied on by Contractor. Contractor may not rely upon nontechnical data, interpretations or opinions contained therein or upon the completeness thereof for Contractor's purposes. Except as indicated above and in paragraph 4.2.6, Contractor shall have full responsibility with respect to subsurface conditions at the site.

4.2.2. Existing Structures: Reference is made to Division 1: General Requirements of the Specifications for the identification of those drawings and physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3) which are at or contiguous to the site that have been utilized by Engineer in preparation of the Contract Documents. Contractor may rely upon the accuracy of the technical data contained in such drawings that is specifically referenced in Division 1: General Requirements as technical data that can be relied on by Contractor. Contractor may not rely upon non-technical data contained in such drawings or upon the completeness thereof for Contractor's purposes. Except as indicated above in this paragraph and in paragraph 4.2.6, Contractor shall have full responsibility with respect to physical conditions in or relating to such structures.

PAYMENT AND PERFORMANCE BONDS

SC-5.1

Add the following after the last sentence of General Condition 5.1:

In accordance with section 255.05(1), Fla. Stat., as amended from time to time, before commencing the Work or before recommencing the Work after a default or abandonment, the Contractor shall execute and record in the public records of Palm Beach County a payment and performance bond with a surety insurer authorized to do business in the State of Florida, and the Contractor shall be required to provide to the Owner a certified copy of the recorded bond. The Owner may not make a payment to the Contractor until the Contractor has complied with section 255.05(1)(b), Fla. Stat.

CONTRACTOR'S LIABILITY INSURANCE:

SC-5.3.

The limits of liability for the insurance required by paragraph 5.3 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

5.3.1. and 5.3.2. Worker's Compensation, etc. under paragraphs 5.3.1 and 5.3.2 of the General Conditions:

(1) State:	Statutory
(2) Applicable Federal (e.g. Longshoreman's and Harbour Workers' Compensation, Maritime, Jones Act, etc.):	Statutory
(3) Employer's Liability:	$ 1,000,000

5.3.3, 5.3.4, 5.3.5, 5.3.6. Comprehensive General Liability (under paragraphs 5.3.3 through 5.3.6 of the General Conditions):

(1) Bodily Injury (including completed operations and products liability):

$ 1,000,000	Each Occurrence
$ 3,000,000	Annual Aggregate

Property Damage:

$ 1,000,000	Each Occurrence
$ 1,000,000	Annual Aggregate
or a combined single limit of	$ 1,000,000

(2) Property Damage liability insurance will provide Explosion, Collapse and Underground coverage where applicable.

(3) Personal Injury, with employee exclusion deleted
$ 1,000,000 Annual Aggregate

5.3.7. Comprehensive Automobile Liability:
Bodily Injury:
$ 500,000 Each Person
$ 1,000,000 Each Occurrence

Property Damage:
$ 500,000 Each Occurrence
or a combined single limit of $ 1,000,000

Add new paragraphs immediately after paragraph 5.3.7 of the General Conditions which are to read as follows:

5.3.8. Umbrella Excess Liability Insurance:

(1) $ 1,000,000 Each Occurrence
$ 1,000,000 Annual Aggregate

(2) The umbrella coverage shall be Following-Form being no more restrictive than coverage required for the underlying policies.

5.3.9. The comprehensive general liability insurance and umbrella insurance required under paragraph 5.3 and SC-5.3, and the contractual liability insurance required under SC-5.4, of the General Conditions shall include Owner and Engineer as additional insureds.

5.3.10 Prior to beginning work, Contractor shall provide Owner and Engineer with its Certificates of Insurance and endorsements naming Owner and Engineer as additional insureds in accordance with the requirements of the Contract Documents.

CONTRACTUAL LIABILITY INSURANCE:

SC-5.4.

The Contractual Liability Insurance required by paragraphs 5.4 of the General Conditions shall provide coverage for not less than the following amounts:

5.4.1. Bodily Injury:
$ 1,000,000 Each Occurrence
5.4.2. Property Damage:
$ 1,000,000 Each Occurrence
$ 3,000,000 Annual Aggregate

OWNER'S LIABILITY INSURANCE:

SC-5.5.

Delete paragraph 5.5 of the General Conditions in its entirety.

PROPERTY INSURANCE:

SC-5.6.

Delete paragraph 5.6 of the General Conditions in its entirety and insert the following in its place:

Contractor shall purchase and maintain on Projects with above ground structures, property insurance upon the Work at the site to the full insurable value thereof (subject to deductible amounts as may be provided in these Supplementary Conditions or required by Laws and Regulations). This insurance shall include the interests of Owner, Contractor, Subcontractors and Engineer in the Work (all of whom shall be listed as insured or additional insured parties), shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be provided in these Supplementary Conditions, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). If not covered under the "all risk" insurance or otherwise provided in these Supplementary Conditions, Contractor shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment. The policies of insurance required to be purchased and maintained by Contractor in accordance with this paragraph 5.6 shall comply with the requirements of SC-5.8 and SC-5.9.

5.6.1. For all other Projects and portions of Projects not classified as above ground structures, Contractor shall add to the property insurance and/or maintain an Installation Floater with aggregate coverage of the total value of the Work.

5.6.2. When the Work includes the handling and installation of Owner furnished equipment, Contractor shall add to Property insurance or Installation Floater the amount of $ N/A which is the total value of the Owner furnished items.

SC-5.7.

Delete paragraph 5.7 of the General Conditions in its entirety and insert the following in its place:

5.7. Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by these Supplementary Conditions or Laws and Regulations which shall include the interests of Owner, Contractor, Subcontractors and Engineer in the Work, all of whom shall be listed as insured or additional insured parties.

5.7.1. Boiler and Machinery Policy Required. (None required by Owner this Project)

5.7.2. Additional Property Insurance Required. (None required by Owner this Project)

SC-5.8.

Delete paragraph 5.8 of the General Conditions in its entirety and insert the following in its place:

5.8. All policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by Contractor in accordance with paragraphs 5.3 through 5.10 shall contain the following provision or endorsements:

5.8.1. The Owner shall be the trustee of all monies received as an insured loss and shall be so named.

5.8.2. That the coverage afforded will not be cancelled or materially changed or renewal refused until at least ten days' prior written notice of cancellation for nonpayment of premium, and thirty days prior written notice for other cancellations or material changes have been given to Owner and Engineer by certified mail and shall contain waiver provisions in accordance with paragraph 5.11.2.

SC-5.9.

Delete paragraph 5.9 of the General Conditions in its entirety and insert the following in its place:

5.9. The maximum deductible amount for the insurance provided in response to paragraphs SC-5.6 and SC-5.7 shall be $ 5,000.00 . The risk of loss within the deductible amount shall be borne by

Contractor, Subcontractor 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.

SC-5.10.

Delete paragraph 5.10 of the General Conditions in its entirety.

ACCEPTANCE OF INSURANCE:

SC-5.14.

Delete paragraph 5.14 of the General Conditions in its entirety and insert the following in its place:

5.14. Owner shall review the coverage afforded by or other provisions of the insurance required to be purchased and maintained by Contractor after delivery of insurance certificates to Owner in accordance with paragraph 2.7 of the General Conditions. Contractor shall furnish to the Owner such additional information in respect of insurance provided by Contractor as the Owner may reasonably request.

5.14.1. Review of Insurance Policies or Insurance Certificates by the Owner shall not relieve or decrease the liability of the Contractor hereunder.

5.14.2. In case of the breach by Contractor of any insurance provision stated in the Contract Documents, the Owner, at his option, may take out and maintain, at the expense of the Contractor, such insurance as the Owner may deem proper and Owner may deduct the cost of such insurance from any monies which may be due or become due the Contractor under this Contract.

5.14.3. All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by Contractor shall contain the name of the Project.

CONCERNING SUBCONTRACTORS, SUPPLIERS AND OTHERS:

SC-6.8.3.

Add the following paragraph to the General Conditions:

6.8.3. If the Bid Form or Specifications require (or if requested by Owner prior to the Notice of Award) the apparent Successful Bidder and any other Bidder so requested, shall submit a list of all Subcontractors, Suppliers and other persons or organizations (including those who are to furnish the principal items of material and equipment) in accordance with requirements of paragraph 10. of the Instructions to Bidders and Article 6.8.2. of the General Conditions.

SC-6.9.

Add the following language at the end of paragraph 6.9 of the General Conditions:

Owner or Engineer may furnish to any such Subcontractor, Supplier or other person or organization, to the extent practicable, evidence of amounts paid to Contractor in accordance with Contractor's Applications for Payment.

SC-6.13

When the Owner is a public agency, add the following at the end of paragraph 6.13 of the General Conditions:

Contractor shall obtain and pay for the following permits:

1. City of Lake Worth Building Permit. Include in the bid amount a 3-percent permit fee based on the bid cost. This permit fee amount will be adjusted based on the actual fee charged and the difference credited as applicable.
2. Any other permits as applicable.

INDEMNIFICATION

SC-6.30

Delete paragraph 6.30 of the General Conditions in its entirety and insert the following in its place:

Contractor shall indemnify and hold harmless Owner and Engineer and their respective officers, and employees for liabilities, damages, losses, and costs, including but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Contractor and persons employed or utilized by the Contractor in the performance of the construction contract.

SC-6.31

Delete paragraph 6.31 of the General Conditions in its entirety.

PROJECT REPRESENTATION:

SC-9.3.1.

Add the following paragraph to the General Conditions:

9.3.1. If the Engineer furnishes a Resident Project Representative as per Article 9.3. of the General Conditions, the duties, etc. of the representative shall be as provided in the LISTING OF THE DUTIES, RESPONSIBILITIES AND LIMITATIONS OF AUTHORITY OF THE RESIDENT PROJECT REPRESENTATIVE as included in the Project Manual. If Owner designates another agent to represent Owner at the site who is not Engineer's agent or employee, the duties, responsibilities and limitations of authority of such other agent will be as presented at the Preconstruction Conference.

REJECTING DEFECTIVE WORK

SC-9.6

Add the following after the last sentence of General Condition 9.6:

ENGINEER will also have authority to disapprove or reject Work which 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.

UNIT PRICE WORK

SC-11.9.3.

Delete paragraph 11.9.3 of the General Conditions in its entirety and substitute the following in its place:

11.9.3. Contractor may not make a claim for additional expenses incurred as a result of a difference between final quantity of any item(s) of Unit Price Work and the estimated quantity of such items(s) in the Contract Documents, unless specifically allowed in the Bid Form. Any adjustments specifically allowed shall be made in accordance with directions in the Bid Form.

WARRANTY AND GUARANTEE:

SC-13.1.

Change the second sentence of paragraph 13.1 of the General Conditions to read as follows:

Prompt notice of all observed defects shall be given to the Contractor.

TESTS AND INSPECTIONS:

SC-13.3.

Delete paragraph 13.3 of the General Conditions in its entirety and insert the following in its place:

Contractor shall give twenty-four hour notice to Engineer for all required inspections, tests or approvals, except as otherwise provided.

ONE YEAR COLLECTION PERIOD

SC-13.12

Add the following after the last sentence of General Condition 13.12:

Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced, 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.

FINAL PAYMENT AND ACCEPTANCE

SC-14.13

Replace the last sentence of General Condition 14.13 with the following:

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.

TERMINATION OFAGREEENT

SC-15.4

Remove General Condition 15.4 in its entirety and replace with the following:

The Owner may terminate this contract for convenience upon providing Contractor fourteen (14) days written notice of the same. If this Contract is terminated as provided herein, the Contractor shall be paid for all completed and acceptable work executed and allowable expenses incurred prior to the date of termination. Payment shall include services actually performed in full prior to termination date, but shall exclude all lost profits, direct, indirect, consequential, special damages, or other damages for the remainder of the project.

If a court of competent jurisdiction finds that the Owner wrongfully terminated this Contract, then in such event, this Contract shall be deemed terminated for convenience as provided for in this paragraph, and the Contractor shall not be entitled to damages or loss of profits, but may be entitled to all items as authorized herein.

SC-16.

Delete Article 16-ARBITRATION of the General Conditions in its entirety.

MISCELLANEOUS PROVISIONS

SC-18

Add Article 18 as follows:

SC-18.1

Controlling Law and Venue.

This Contract is to be governed by the laws of the State of Florida. The venue for any and all legal action necessary to enforce the Contract Documents will be in Palm Beach County, Florida.

SC-18.2

Headings.

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

SC-18.3

Inspector General.

In accordance with Palm Beach County ordinance number 2011-009, the Contract Documents may be subject to investigation and/or audit by the Palm Beach County Inspector General. Contractor should review Palm Beach County ordinance number 2011-009 in order to be aware of its rights and/or obligations under such ordinance and as applicable.

SC-18.4

Enforcement Costs.

If any legal action or other proceeding is brought for the enforcement of the Contract Documents, or because of an alleged dispute, breach, default or misrepresentation in connection with any provisions of the Contract Documents, the parties agree that each party shall be responsible for its own attorney's fees.

SC-18.5

Waiver.

Failure of either party to enforce or exercise any right(s) under the Contract Documents shall not be deemed a waiver of either party's right to enforce or exercise said right(s) at any time thereafter.

SC-18.6

Jury Trial.

TO ENCOURAGE PROMPT AND EQUITABLE RESOLUTION OF ANY LITIGATION, EACH PARTY HEREBY WAIVES ITS RIGHTS TO A TRIAL BY JURY IN ANY LITIGATION RELATED TO THE CONTRACT DOCUMENTS.

SC-18.7

Independent Contractor.

The Contractor is, and shall be, in the performance of all services under this Contract, an Independent Contractor, and not an employee, agent, or servant of the Owner. All persons engaged in any of the services performed pursuant to this Contract shall at all times, and in all places, be subject to the Contractor's sole direction, supervision, and control. The Contractor shall exercise control over the means and manner in which it and its employees perform the services.

SC-18.8

Access and Audits.

The Contractor shall maintain adequate records to justify all charges, expenses, and costs incurred in estimating and performing the Work for at least five (5) years after final payment is made. The Owner shall have access to such books, records, and documents as required in this section for the purpose of inspection or audit during normal business hours, at the Contractor's place of business. In no circumstances will Contractor be required to disclose any confidential or proprietary information regarding its products and service costs.

SC-18.9

Time.

Time is of the essence in all respects under the Contract Documents.

SC-18.10

Preparation. This Contract shall not be construed more strongly against either party regardless of who was more responsible for its preparation.

SC-18.11

Representation and Binding Authority.

Contractor's representative below has full power, authority and legal right to execute and deliver these Contract Documents and perform all of its obligations under the Contract Documents. By signing the Contract Documents, the representative hereby represents to the Owner that he/she has the authority and full legal power to execute the Contract Documents and any and all documents necessary to effectuate and implement the terms of the Contract Documents on behalf of the party for whom he or she is signing and to bind and obligate such party with respect to all provisions contained in the Contract Documents.

NO DAMAGES FOR DELAY

SC-19

NO CLAIM FOR DAMAGES OR ANY CLAIM OTHER THAN FOR AN EXTENSION OF TIME SHALL BE MADE OR ASSERTED AGAINST OWNER BY REASON OF ANY DELAYS. Contractor shall not be entitled to an increase in the Contract Price or payment or compensation of any kind from Owner for direct, indirect, consequential, impact or other costs, expenses, or damages, including, but not limited to, costs of acceleration or inefficiency, arising because of delay, disruption, interference, or hindrance be reasonable or unreasonable, foreseeable, or avoidable or unavoidable. Contractor shall be entitled only to extensions of the Contract Time as the sole and exclusive remedy for such resulting delays, in accordance with and to the extent specifically provided herein.

PART 2 - ADDITIONAL SUPPLEMENTARY CONDITIONS

1. ATTACHMENTS:

The following forms included in the Project Manual shall be used by Contractor for submittals required by the Contract Documents (unless Owner accepts other form):

a. Construction Performance Bond (00610).

b. Construction Payment Bond (00620).
c. Notice of Compliance with Chapter 556, Florida Statutes (00630).

d. Contractor's Affidavit to Owner (00670).

e. Form of Application for Payment (00680).

f. This space left blank intentionally.

2. DESIGN PROFESSIONALS REPRESENTING OWNER AND/OR ENGINEER AND DIVISION OF RESPONSIBILITIES

a. Various Design Professionals (i.e. Civil, Structural, Mechanical, Electrical, Groundwater Hydrology, Environmental, Landscape Architect, Architect, etc.) as consultants to Owner and/or Engineer, prepared or assisted in the preparation of Drawings and Specifications for the Project. The Owner and/or Engineer may have the various Design Professionals provide services during construction phase of the Project. The Design Professionals will be representatives of the Owner and/or Engineer. Visits to the site by the Design Professionals will be on the basis of General Conditions Paragraph 9.2, VISITS TO SITE. Also General Conditions Paragraphs 9.13 through 9.16, LIMITATIONS ON ENGINEER'S RESPONSIBILITIES includes the various Design Professionals for this Project.

b. Communication to and from the various Design Professionals will be coordinated through the Engineer.

END OF SECTION

00820
SPECIAL CONDITIONS

CITY OF LAKE WORTH PURCHASING DEPARTMENT REQUIREMENTS

SPC-1 APPROVAL OF ACCOUNTING SYSTEM

Except with respect to firm fixed-price contracts, no contract type shall be used unless the Purchasing Manager has determined in writing that:

1) The proposed contractor's accounting system will permit timely development of all necessary cost data in the form required by the specific contract type contemplated; and

2) The proposed contractor's accounting system is adequate to allocate costs in accordance with generally accepted cost accounting principles.

SPC-2 RIGHT TO INSPECT PLANT

The City may, at reasonable times, inspect any part of the plant, place of business, or work site of a contractor or subcontractor which is pertinent to the performance of any contact awarded or to be awarded by the City.

SPC-3 RIGHT TO AUDIT RECORDS

1) Audit of Cost or Pricing Data: The City may, at reasonable times and places audit the books, documents, papers and records of any contractor who has submitted cost or pricing data to the extent that such books, documents, papers and records are pertinent to such cost or pricing data. Any person who receives a contract, change order or contract modifications for which cost or pricing data is required, shall maintain such books, documents, papers and records that pertinent to such costs or pricing data for three (3) years from the data of the final payment under the contract.

2) Contract Audit: The City shall be entitled to audit the books, documents, papers and records of a contractor or a subcontractor at any tier under any negotiated contract or subcontract other than a firm fixed-price contract to the extent that such books, documents, papers and records are pertinent to the performance of such contract or subcontract. Such books, documents, papers and records shall be maintained by the contractor for a period of three (3) years from the date of final payment under the prime contract and by the subcontractor for a period of three (3) years from the date of final payment under the subcontract.

3) Contractor Records: If a contract is being funded in whole or in part by assistance from a federal agency, then the contract shall include provisions:

   A) Requiring the contractor and subcontractor at any tier to maintain for three (3) years from the date of final payment under the contract all books, documents, papers and records pertinent to the contract; and

B) Requiring the contractor and subcontractor at any tier to provide to the City, the federal grantor agency, the Comptroller General of the United States, or any of their duly authorized representatives access to such books, documents, papers and records for the purposes of examining. Auditing and copying them.

SPC-4 LOCAL VENDOR PREFERENCE

In the event the lowest responsive, responsible bidder or the highest ranked responsive, responsible proposer in the procurement of goods, services or construction is a non-LOCAL business, then all bids and or proposals from responsive, responsible LOCAL businesses to the same solicitation shall be adjusted by five (5) percent, solely for the purpose of determining bid/contract award. The bid price of LOCAL bidders will be adjusted downward by five (5) percent for purposes of ranking of bidders.

In no event, shall the application of this adjustment to a responsive quote or bid change the actual bid amount. Further, it will not cause the City to pay more than $15,000 above the amount bid by that non-local vendor, which would have been recommended for award if the local vendor preference had not been applied.

If the application of the five-percent local vendor preference causes the *evaluated local vendor price* to be less than the actual low-bid price, but the actual bid price of the local vendor is more than $15,000 higher than the actual low-bid price of a non-local vendor, then the non-local vendor submitting the actual low-bid, shall be viewed as the low-bidder, and be recommended for award, unless for reasons other than price, the bid is not found to be responsive and/or responsible.

The determination as to whether a bidder or proposer is a local or non-local business shall be made by the Purchasing Division, after confirming the vendor has a valid business tax receipt and certificate of occupancy, as reflected within the Business Master File of the city's ERP system. The bidder or proposer does not have to be a current vendor to the City (City as a customer) at the time of bidding/proposing, but must have been issued a business tax receipt applicable to the goods/services/ construction being requested, PRIOR to the due date/time for bids/proposals. Prior to making an award through the application of the local vendor preference, city staff may require a bidder or proposer to provide additional information at any time prior to the award.

A *LOCAL business*, for the purposes of the application of a local vendor preference, means a bidder or proposer which has a permanent, physical place of business within the city limits, and a valid business tax receipt applicable to the required goods, services, or construction items being procured. Post office boxes or locations at a postal service center are not verifiable and shall not be used for the purpose of establishing said physical address. If the business is a joint venture/partnership, it is sufficient for qualification as a LOCAL business if at least one party of the joint venture/partnership meets the test set forth in this Section.

Non-LOCAL business means a bidder or proposer which is not a LOCAL business as defined herein.

Permanent place of business means headquarters which are located within the city limits or a permanent office or other site located within the city limits from which a bidder or proposer will produce a substantial portion of the goods or perform a substantial portion of the services to be purchased. A post office box or location at a postal service center shall not constitute a permanent place of business.

SPC-5 CONTRACTOR'S START OF WORK & CHANGE OF SCOPE

1) The Contractor shall not perform work without a Purchase Order.

2) The Contractor shall not work out of scope without a signed, issued change order to the purchase order, authorizing the additional work and any change to the period of performance (Construction Contract Time).

SPC-6 APPROPRIATION OF FUNDS

This project is subject to approval and appropriation of funds by the City of Lake Worth Commission.

SPC-7 BUILDING PERMIT FEE

A building permit fee equal to 3-percent of the accepted bid shall be included in the project costs. See Supplemental Conditions paragraph SC-6.13 for further details.

SPC-8 CONE OF SILENCE

All communications shall be in accordance with the City of Lake Worth Municipal Code, Article XIV Purchasing, Section 2-112.K Cone of Silence.

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LISTING OF THE DUTIES, RESPONSIBILITIES AND LIMITATIONS OF AUTHORITY OF THE RESIDENT PROJECT REPRESENTATIVE

ENGINEER may furnish a Resident Project Representative (RPR), assistants and other field staff to assist ENGINEER in observing performance of the Work of the Contractor. RPR may only be part time on site, and CONTRACTOR shall coordinate with RPR as required in the Contract Documents.

Through on-site observations of the Work in progress and field checks of materials and equipment by the RPR and assistants, ENGINEER shall endeavor to provide further protection for OWNER against defects and deficiencies in the Work; but, the furnishing of such services will not make ENGINEER responsible for or give ENGINEER control over construction means, methods, techniques, sequences or procedures or for safety precautions or programs, or responsibility for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

The duties and responsibilities of the RPR are limited to those of ENGINEER in ENGINEER's agreement with the OWNER and in the construction Contract Documents, and are further limited and described as follows:

A. GENERAL

RPR is ENGINEER's agent at the site, will act as directed by and under the supervision of ENGINEER, and will confer with ENGINEER regarding RPR's actions. RPR's dealings in matters pertaining to the on-site work shall in general be with ENGINEER and CONTRACTOR keeping OWNER advised as necessary. RPR's dealings with subcontractors shall only be through or with the full knowledge and approval of CONTRACTOR. RPR shall generally communicate with OWNER with the knowledge of and under the direction of ENGINEER.

B. DUTIES AND RESPONSIBILITIES OF RPR

1. SCHEDULES: Review the progress schedule, schedule of Shop Drawing submittals and schedule of values prepared by CONTRACTOR and consult with ENGINEER concerning acceptability.

2. CONFERENCES AND MEETINGS: Attend meetings with CONTRACTOR, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

3. LIAISON:

   a. Serve as ENGINEER's liaison with CONTRACTOR, working principally through CONTRACTOR's superintendent and assist in understanding the intent of the Contract Documents; and assist ENGINEER in serving as OWNER's liaison with CONTRACTOR when CONTRACTOR's operations affect OWNER's on-site operations.

   b. Assist in obtaining from OWNER additional details or information, when required for proper execution of the Work.

4. SHOP DRAWINGS AND SAMPLES:

   a. Record date of receipt of Shop Drawings and samples.

   b. Receive samples which are furnished at the site by CONTRACTOR, and notify ENGINEER of availability of samples for examination.

c. Advise ENGINEER and CONTRACTOR of the commencement of any Work requiring a Shop Drawing or sample if the submittal has not been approved by ENGINEER.

5. REVIEW OF WORK, REJECTION OF DEFECTIVE WORK, INSPECTIONS AND TESTS:

a. Conduct on-site observations of the Work in progress to assist ENGINEER in determining if the Work is in general proceeding in accordance with the Contract Documents.

b. Report to ENGINEER whenever RPR believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise ENGINEER of Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

c. Verify that tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that CONTRACTOR maintains adequate records thereof; and observe, record and report to ENGINEER appropriate details relative to the test procedures and startups.

d. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to ENGINEER.

6. INTERPRETATION OF CONTRACT DOCUMENTS: Report to ENGINEER when clarifications and interpretations of the Contract Documents are needed and transmit to CONTRACTOR clarifications and interpretations as issued by ENGINEER.

7. MODIFICATIONS: Consider and evaluate CONTRACTOR's suggestions for modifications in Drawings or Specifications and report with RPR's recommendations to ENGINEER. Transmit to CONTRACTOR decisions as issued by ENGINEER.

8. RECORDS:

a. Maintain at the job site or ENGINEER's office files for correspondence, reports of job conferences, Shop Drawings and samples, reproductions of original Contract Documents including all Work Directive Changes, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, ENGINEER's clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.

b. Record names, addresses and telephone numbers of all CONTRACTORS, subcontractors and major suppliers of materials and equipment.

9. REPORTS:

a. Furnish ENGINEER periodic reports as required of progress of the Work and of CONTRACTOR's compliance with the progress schedule and schedule of Shop Drawing and sample submittals.

b. Consult with ENGINEER in advance of scheduled major tests, inspections or start of important phases of the Work.

c. Draft proposed Change Orders and Work Directive Changes, obtaining backup material from CONTRACTOR and recommend to ENGINEER Change Orders, Work Directive Changes, and Field Orders.

d. Report immediately to ENGINEER and OWNER upon the occurrence of any accident witnessed by RPR or that was otherwise made known to RPR.

10. PAYMENT REQUESTS: Review applications for payment with CONTRACTOR for compliance with the established procedure for their submission and forward with recommendations to

ENGINEER, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the site but not incorporated in the Work.

11. CERTIFICATES, MAINTENANCE AND OPERATION MANUALS: During the course of the Work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to ENGINEER for review and forwarding to OWNER prior to final payment for the Work.

12. COMPLETION:

a. Before ENGINEER issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring completion or correction.

b. Conduct final inspection in the company of ENGINEER, OWNER and CONTRACTOR and prepare a final list of items to be completed or corrected.

c. Observe that all items on final list have been completed or corrected and make recommendations to ENGINEER concerning acceptance.

C. LIMITATIONS OF AUTHORITY

Resident Project Representative:

1. Shall not authorize any deviation from the Contract Documents or substitution of materials or equipment, unless authorized by ENGINEER.

2. Shall not exceed limitations of ENGINEER's authority as set forth in the Contract Documents.

3. Shall not undertake any of the responsibilities of CONTRACTOR, subcontractors or CONTRACTOR's superintendent.

4. Shall not advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.

5. Shall not advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.

6. Shall not accept Shop Drawing or sample submittals from anyone other than Contractor.

7. Shall not authorize OWNER to occupy the Project in whole or in part.

8. Shall not participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by ENGINEER.

END OF SECTION

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LIST OF DRAWINGS

The Drawings which form a part of the Contract Documents and show the Work to be performed are as follows:

Drawing Title	Drawing Number	No. of Sheets	Dated
Water Treatment Plant High Service Pump Improvements	44-43-28-304	12	May 2016

SPECIFICATIONS
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SECTION 01000

GENERAL REQUIREMENTS

1.0 PROJECT LOCATION

Lake Worth Water Treatment Plant at 301 College Street, Lake Worth, Florida.

2.0 SCOPE OF WORK

A. The Work to be performed by the Contractor includes permitting, inspecting, furnishing all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to modify, construct, complete, deliver and place in operation the subject Project as shown on the Drawings and/or as herein described as specified. All Work to be in accordance with the Contract Documents.

3.0 REFERENCE POINTS

A. Horizontal and vertical control have been provided in the Drawings. All construction staking to be provided by the Contractor.

4.0 GRADES, DIMENSIONS, AND ELEVATIONS

A. Written dimensions have preference over scaled dimensions. All elevations are based on the 1929 National Geodetic Vertical Datum (N.G.V.D.).

5.0 EXISTING STRUCTURES AND UTILITIES

A. All known utilities have been shown on the Drawings according to the best information available. It is the Contractor's responsibility to contact all owners of structures or utilities above ground, on the surface, or below the ground, within the Project area so that said owners may stake or otherwise mark or protect their facilities. The Contractor must provide facilities and be responsible for the protection of all structures, buildings and utilities, underground, on the surface, or above ground against trenching, dewatering, or any other activity connected with the Work throughout the entire Contract Time.

B. When structures and utilities have been properly shown or marked and are disturbed or damaged in the execution of the Work, they must be repaired immediately in conformance with best standard practice and the approval of the owner of the damaged utility or structure. In the case of structures and utilities which have not been properly shown or located as outlined above and are disturbed or damaged in the prosecution of the Work, take whatever steps are necessary for safety and notify the affected utility owner and avoid any actions which might cause further damage to the structure or utility.

C. Should the Work require repairs, changes or modifications of the Owner's utilities as well as other utilities, it is the responsibility of the Contractor to provide for the maintenance of continuous water, sewage, electric, telephone and other utility services to all present customers of such utilities, unless approval in writing is secured from the applicable utility company or Owner for interruption of such service.

D. Contractor is responsible for verifying all vertical and horizontal locations of all existing utilities and structures, whether shown on the drawings or not, to verify any potential conflicts prior to ordering any materials.

6.0 QUALITY CONTROL

A. Testing Laboratory Services:

All tests and analyses, which are called for in the Specifications and/or Drawings to be performed by an Independent Testing Laboratory, will be at the Owner's expense unless otherwise specified, provided the tests and analyses determine that the material(s) and/or Work meets the requirements as specified. All such tests that fail to meet the Project requirements are to be paid by the Contractor. Contractor shall be responsible for scheduling test lab visits in a manner to limit costs of stand-by time and non-tests assessed because of minimum per visit charges. Such excessive costs will be paid by Contractor.

B. Field Observations:

Provide twenty-four (24) hour notification to the Engineer for all specified field observations, unless otherwise noted.

7.0 MOBILIZATION

A. Consists of the preparatory Work and operations in mobilizing for beginning Work on the Project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the Project site, and for the establishment of temporary offices, buildings, safety equipment and first aid supplies, sanitary and other facilities, as required by these Specifications, and State and local laws and regulations.

The costs of bonds, insurance and any other pre-construction expenses necessary for the start of the Work, excluding the cost of construction materials, is to be included in Mobilization.

B. When the Bid Form includes a separate pay item for Mobilization, partial payments will be made in accordance with the following:

Percent of Contract Price Less Mobilization Earned	Allowable Percent of the Lump Sum Price of Mobilization
5	25
10	50
25	75
50	100

The standard retainage will be applied to these payments. Previous payments for Mobilization and unpaid amounts on Allowances will not be considered in calculating the percent of the Contract Price earned. Payments will be made in stepped increments as shown and will not be interpolated between steps.

C. When the Bid Form does not include a separate item for Mobilization, all Work and incidental costs specified as being covered under Mobilization is to be included for payment under the several scheduled items on the Bid Form, and no separate payment will be made therefor.

8.0 MAINTENANCE OF TRAFFIC

A. In the Contractor's use of streets and highways for the Work to be done under these Specifications, conform to all Municipal, County, State and Federal laws and regulations as applicable. Provide, erect and maintain effective barricades, warning lights, and signs on all intercepted streets or highways for protection of the Work and safety of the public. All barricades or obstructions which encroach on or are adjacent to the public rights of way should be provided with lights which are illuminated at all times between sunset and sunrise.

B. Contractor shall schedule Work to cause minimum disturbance of normal pedestrian and vehicular traffic and be responsible for providing suitable means of access to all public and private properties during all stages of the construction. Other than for an emergency safety condition, the Contractor must contact the Owner and Engineer for approval prior to completely blocking off any street to vehicular traffic during construction. Contractor shall provide written notification to emergency, police, fire and other appropriate agencies at least 24 hours in advance of new work or changed work.

C. Maintain traffic in accordance with Section 102 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, 2007 Edition, except as follows:

1. Contractor is responsible for preparing a Maintenance of Traffic plan. Submit plan for Owner or roadway authority (City, County, D.O.T.) review.

   The Maintenance of Traffic plan must be prepared by a person who is certified by an FDOT certified school or an engineer licensed in the State of Florida.

2. When the Bid Form does not include a separate item for Maintenance of Traffic, the costs are to be included for payment under the several scheduled items on the Bid Form, and no separate payment will be made.

9.0 PLACING EQUIPMENT INTO SERVICE

A. Do not operate or place into service or energize, electrical and mechanical equipment until approved by the Owner and Engineer. Such approval may be granted only after all interested parties have been duly notified, have given approval for placing the equipment into service, and all interested parties are present or waived their right to be present. Contractor shall provide, in writing, seventy-two (72) hour notification for all item and equipment start-ups.

10.0 SALVAGEABLE MATERIAL

A. All salvageable material and/or equipment removed as a part of the Work for which specific use, relocation or other disposal is not specifically noted on the Drawings or otherwise specified, must be disposed of by the Contractor. All material and/or equipment not in salvageable condition as determined by the Engineer, must be disposed of by the Contractor. The actual storage site for salvageable material will be designated by the Owner.

11.0 BORING LOGS, OTHER REPORTS AND DRAWINGS UTILIZED BY ENGINEER

A. Boring Logs, other reports and Drawings utilized by Engineer, if attached at the end of these Specifications, are provided for Contractor's information in accordance with paragraph 4. of the Instructions to Bidders and are not a part of the Contract Documents. There is no technical data in the Boring Logs, other reports or Drawings that should be relied on by the Contractor. There also were no other reports or drawings utilized by Engineer in preparation of the Contract Documents that contained data that could be relied on by the Contractor.

12.0 DISPOSAL OF EXCAVATED MATERIALS AND DEBRIS

A. All excess excavated material and debris not required for backfill (unless otherwise noted), broken pipe, sidewalks, curbs and other concrete items, together with all roots, boards and other debris are to be disposed of by the Contractor at an appropriate legal site.

13.0 TEMPORARY CONTROLS AND FACILITIES

A. The Contractor is responsible for compliance with all NPDES regulations including submitting a Pollution Prevention Plan, submitting a Notice of Intent, conducting maintenance and inspection of controls, erosion and sediment controls and submitting a Notice of Termination.

B. As part of the Work, the Contractor shall be responsible for applying for, obtaining and complying with all required dewatering permits. Contractor shall notify South Florida Water Management District (SFWMD) prior to all dewatering activities. All dewatering shall meet SFWMD requirements.

C. Contractor shall install all turbidity control devices required by SFWMD, if necessary. Contractor shall notify SFWMD for inspection of turbidity control devices prior to any construction activities.

14.0 CONSTRUCTION SCHEDULE MEETINGS

A. Contractor shall submit a construction schedule in accordance with the General Conditions. Contractor's Project Manager and a representative of subcontractors performing work at the time of the meeting shall attend a coordination/progress meeting a minimum of once a month, as designated by the Owner, at the Owner's office during the progress of the Work. Contractor shall submit an updated construction schedule to the Engineer at each coordination/progress meeting.

15.0 MISCELLANEOUS

A. Prior to final payment, Contractor shall ensure that all fuel tanks, etc. are full.

B. All bolts, nuts, washers, etc. and miscellaneous hardware shall be 316 stainless steel, unless otherwise indicated.

16.0 CONTRACTOR'S SUBMITTALS

A. Contractor shall be required to submit, with a letter of transmittal to the Engineer, a minimum of six (6) copies of each checked and approved shop drawing, mix report, laboratory results, etc., where required in the specifications, Drawings or as appropriate, in lieu of the five (5) copies specified in Article 6 of the General Conditions or as specified elsewhere in these Specifications. Of the ten copies submitted, two copies will be returned to the Contractor for the Contractor's use. If the Contractor requires any additional approved copies, the Contractor shall submit additional copies at the time of initial submission. Allow a minimum of two weeks from date of receipt for review by the Engineer. Review of shop drawings will be general and will not relieve the Contractor from any responsibility.

B. Contractor shall be required to submit, with a letter of transmittal to the Engineer, for review and approval, four (4) hard copies and four (4) copies in CD format of each Operation and Maintenance Manual for all equipment, regardless of the number of submittals specified elsewhere in these Specifications.

17.0 CONSTRUCTION SEQUENCE

A. In addition to requirements of the Specifications and Drawings, the Contractor shall submit Construction Schedule and Project Phasing and Temporary Facilities Plan to Engineer which will include coordination of the various elements of the Work.

B. The Water Treatment Plant must remain in continuous operation. Only selected portions may be taken out of service at any given time. The Contractor shall include these events in his schedule and phasing plan. The Contractor must coordinate any outage in advance with the Engineer and Owner's operational staff.

18.0 PROTECTION AND RESTORATION OF SURVEY MONUMENTS

A. The Contractor shall be responsible for protecting and restoring all land and property corners, such as section corners, ¼ section corners, property corners or block control points, and for maintaining all horizontal and vertical control points. All surveying work shall be the responsibility of the Contractor and shall be performed under the supervision of a Florida Professional Surveyor and Mapper. Survey points that will be destroyed during construction shall

be properly referenced and replaced at the Contractor's expense with permanent monuments approved by the ENGINEER.

19.0 GENERAL ALLOWANCE

A. General Allowance: The work to be paid under this item may cover unforeseen and unanticipated costs associated with the work. Use of the General Allowance requires written authorization by the Owner prior to performing any work under this item. Any unused portion of the General Allowance will be credited to the Owner at the time of final payment.

B. 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 or any credit due for unused allowance balances, and the Contract Price shall be correspondingly adjusted.

20.0 ORDER OF PRECEDENCE

A. The Order of Precedence shall follow the order as set forth in Article B Contract Documents, page 00500-4 of the Agreement.

B. In the case of a discrepancy between any of the Contract Documents, the most restrictive requirement shall govern unless otherwise determined by the Engineer.

C. In the event that a conflict cannot be resolved by the methods listed in paragraph A or B above, the Engineer shall review the dispute and issue a clarification to resolve the issue. The Engineer's decision shall be binding on all parties. In general the Engineer will consider the overall intent of the project as presented in the contract documents, and render a decision consistent with the overall project objectives.

21.0 APPROVED PRODUCTS LIST

A. All materials furnished shall be the manufacture and model as included in the City of Lake Worth Water Utilities Department Approved Products List unless otherwise noted.

22.0. POLICIES AND PROCEDURES MANUAL

A. All work undertaken under this contract shall be completed in accordance with the Water Utilities Department Policies and Procedures Manual.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Measurement and payment criteria applicable to the Work performed under a Unit Price payment method.

1.02 AUTHORITY

A. Measurement methods delineated in the individual Specification sections are intended to complement the criteria of this Section. In the event of conflict, the requirements of the individual Specification section will govern.

B. The Engineer will take all measurements and compute quantities unless noted otherwise herein.

C. Contractor to assist Engineer by providing necessary equipment, workers, and survey personnel as required.

1.03 UNIT QUANTITIES SPECIFIED

A. Quantities and measurements indicated in the Bid Form are for bidding and Contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer will determine payment. Waste will not be included in the measurements or quantities.

B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the Contract Unit Price.

1.04 VOLUME MEASUREMENT

A. Measured by cubic dimension using mean length, width, and height or thickness.

B. For excavation of lakes, canals, ditches, etc., material will be measured in its original position by a Professional Land Surveyor who is licensed in the State of Florida. The Surveyor will be retained by the Contractor. Quantities will be based on before and after cross sections determined by the Surveyor. Payment will not be made for excavation beyond the lines shown on the Drawings.

1.05 AREA MEASUREMENT

A. Measured by square dimension using mean length and width or radius.

1.06 LINEAR MEASUREMENT

A. Measured by linear dimension, at the item centerline or mean chord.

B. For pipelines, the length will be measured from center of structure or fitting to center of structure or fitting.

1.07 PAYMENT

A. Payment Includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit price for Work which is incorporated in or made necessary by the Work.

C. Payment for lump sum items will be made on the basis of percentage complete as approved by the Engineer.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

1.01 UNIT PRICE SCHEDULE

A. General.

1. Most items in the Unit Price Schedule of the Bid Form, page 00300-5 are self-explanatory; however, the following clarification is provided for selected items.

B. Alternate Bid Item D.1. – Plant Water Service Piping Modification Including Demolition of Existing Piping.

1. The work specified under this item shall include all material and work to demolish existing plant water service piping and install all new piping, fittings, valves, and appurtenances as shown on the drawings and specified herein for a complete workable system. Work under this item shall include disinfection of the newly installed system and bacteriological sample analysis for Health Department release. Payment will be made at the Contract lump sum amount for this item based on the percentage completed and accepted by the Owner.

C. Alternate Bid Item D.2. – High Service Pump VFD Retrofit Complete Including SCADA Programming.

1. The work covered under this item shall include furnishing and installing VFD control equipment for High Service Pumps Nos. 3 and 4 including all necessary hardware and appurtenances as shown on the drawings and specified herein for a complete operable system. The work shall also include reprogramming the High Service Pump Control Sequence in the Plant SCADA System as specified here in. Payment will be made at the Contract lump sum amount for this item based on the percentage completed and accepted by the Owner.

END OF SECTION

SECTION 01720

RECORD DOCUMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. On site maintenance of Record Documents.

B. Required record information.

1.02 MAINTENANCE

A. Maintain on site, one set of the following Record Documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Shop Drawings, product data, and samples.

B. Store Record Documents separate from documents used for construction.

C. Record information concurrent with construction progress.

D. In the interest of timely detection of non-conforming Work, all Record Drawing information must be furnished to the Engineer prior to submitting for payment of that particular item. No progress payment application requests will be approved by the Engineer without satisfactory record drawings for that particular items(s).

E. Record Documents must be available to Engineer for examination at any time during the progress of the Work.

F. Submit completed Record Documents upon completion of the Work and prior to application for final payment.

G. Show record information in bold or boxed out to stand out from rest of Drawing.

H. Record actual revision dates of the Work.

1.03 REQUIRED RECORD DRAWING INFORMATION

A. All elevations and horizontal locations shown on the Drawings must be verified. Verification or deviation must be clearly indicated on the Drawings.

B. Water

1. Top of pipe elevations at 100 foot intervals.
2. Distance from the reference points shown on the Drawings.
3. Horizontal location at 100 foot intervals.
4. Location of water services, valves, fittings, hydrants, blowoff points, etc. by stationing and offsetting from reference points shown on the Drawings.
5. Details of any design changes.
6. Location of utilities and miscellaneous structures encountered which are different from or not shown on the Drawings.
7. Elevations and clearances when water pipeline crosses another pipe.
8. Changes in pipe material.

C. Wall Sleeves

1. Horizontal location and size of wall sleeve.

D. Structural

1. Obtain horizontal and vertical locations and elevations for all structural components, including but not limited to slabs, building and building features, etc.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 CONTRACTOR'S SURVEYOR RESPONSIBILITIES

A. Engineer will provide the Contractor with electronic files of the construction drawings. One copy of the electronic files will be provided on CD/DVD media in AutoDesk Civil 3D 2016 format. No warranty of the usability of the electronic files provided is expressed or implied. The cost of any required conversion or duplication of the electronic files from the format specified herein shall be the responsibility of the Contractor.

B. The Owner and Engineer will advise the Contractor at the pre-construction conference of the acceptable method and file format by which the interim and final Record Drawing information will be provided to the Owner and/or Engineer.

C. Record Drawing information shall be prepared electronically. The Record Drawing information shall be placed on a separate layer so that it is isolated from all other layers in the drawing file. This layer must be prepared in such a manner that it can be exported as a separate AutoCad file and subsequently inserted into an AutoCad drawing containing the approved design information. The AutoCad file shall be accompanied by an Adobe Acrobat portable document format (pdf) file of the Record Drawings.

D. Place information in the Drawings in a manner that indicates which elevations and dimensions have been checked. This is to be done by crossing through the design elevation or dimension and placing the Record information next to it. If an elevation or dimension has not changed, the same procedures should be followed to confirm that it has been checked. Add new information in a manner to indicate that it is Record information and not design information.

E. Each Record Drawing sheet must include the surveyor's name, company, address, license number, and date of field survey.

F. Signed and sealed Record Drawings shall be submitted at the conclusion of the Project.

3.02 CONTRACTOR RESPONSIBILITIES

A. Record document information not required to be obtained by a Professional Surveyor and Mapper must be obtained by the Contractor.

B. Mark Record information on one clean set of prints of the Contract Documents.

C. Each Drawing must be stamped indicating that the information has been reviewed by the Contractor.

D. Contractor's Surveyor will transfer Contractor supplied information to the record drawing.

END OF SECTION

SECTION 02108

VIDEO-RECORDING OF EXISTING CONDITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Video-recording the pre-construction conditions of the surface features within the construction conditions.

1.02 SUBMITTALS

A. Pre Construction: Submit two completed DVD media that is playable on standard DVD players to Engineer at least seven calendar days prior to commencing construction and delivery of any materials and/or equipment.

B. Post Construction: Submit two completed DVD media that is playable on standard DVD players to Engineer for review prior to substantial completion.

1.03 QUALITY ASSURANCE

A. Video-recording must be done by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction video documentation.

B. A Contractor walk through with a handheld camera will not comply with these specifications.

PART 2 PRODUCTS

2.01 MATERIALS

A. DVD Media: Standard name-brand high quality write-once media. New, not previously used.

PART 3 EXECUTION

3.01 PRE CONSTRUCTION VIDEO-RECORDING

A. Video-recording shall be performed and submitted at least seven calendar days prior to the commencement of construction and delivery of any materials and/or equipment. Upon review by the Engineer, and prior to commencement of construction and delivery of any materials and/or equipment, additional video-recording of any portions of the construction areas that are not adequately documented on the initial video-tapes may be required.

B. Video-record the pre-construction conditions of the surface features within the construction area.

C. The video-record will serve as a record of the pre-construction conditions for disputes arising from restoration, and should, therefore, be taken within the construction area in sufficient detail as necessary to clearly depict pre-construction conditions.

D. Indicate the date and time (hour, minutes and seconds) on which the video-records were recorded.

E. Video-records shall record video with simultaneous audio to assist viewer orientation with any needed identification, differentiation, clarification, or objective description of the features being shown with audio recording of commentary by the camera operator. The audio recording shall be free of any conversations between the camera operator and other production technicians.

F. Camera Height and Stability: Do not exceed 10 feet vertical distance between camera lens and the ground when conventional wheeled vehicles are used as conveyances for the recording system.

G. Camera Control: Control camera pan, tilt, zoom-in and zoom-out rates such that recorded objects will be clearly viewed during video tape playback. Control or adjust camera and recording system controls such as lens focus, aperture, light, and white balance to maximize picture quality.

H. Viewer Orientation Techniques: Use existing landmarks including but not limited to, all visible house and business addresses, to maintain viewer orientation.

I. Video Record Log: Provide a written log of each video record's contents including but not limited to, the names of the streets or easements, coverage beginning and ending, directions of coverage, and the date upon which the recording was made.

J. All video-records and DVD's become the property of the Owner.

3.02 POST CONSTRUCTION VIDEO RECORDING

A. Video-record the post-construction conditions.

END OF SECTION

SECTION 02221

DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Demolish existing pumps, piping, valves, equipment pads, and related appurtenances.

B. Remove existing utilities to point of origin.

C. Remove offsite to appropriate disposal site(s), including all hazardous materials.

1.02 EXISTING CONDITIONS

A. Conduct demolition to minimize interference with adjacent areas.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to commencement, make arrangements to turn off or disconnect existing utilities.

B. Protect existing items which are not indicated to be altered.

C. Provide necessary protection to minimize dust migration off-site.

3.02 EXECUTION

A. Demolish in an orderly manner.

B. Except where noted otherwise, immediately remove demolished materials from site to an approved landfill(s).

C. All demolitions shall conform to all Federal, State and local laws, rules, and ordinances pertaining to the demolition of materials, including materials containing hazardous materials such as asbestos and lead.

END OF SECTION

SECTION 02613

DUCTILE-IRON PIPE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ductile iron pipe and fittings for Potable Water, Wastewater, and Reclaimed Water Systems, sizes 3 inch diameter through 64 inches in diameter.

1.02 RELATED SECTIONS

A. Section 02220 - Excavating, Backfilling and Compacting.

B. Section 02675 - Disinfecting Water Mains.

1.03 REFERENCES

A. ASTM A153-01 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

B. ASTM A 197-00 - Cupola Malleable Iron.

C. ASTM A 307-00 - Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

D. ASTM A 506-00 – Alloy and Structural Alloy Steel, Sheet and Strip, Hot-Rolled and Cold-Rolled.

E. ASTM A 536-99 - Ductile-Iron Castings.

F. ASTM A 575-96 - Steel Bars, Carbon, Merchant Quality, M-Grades.

G. ASTM D 1248-00 - Polyethylene Plastics Extrusion Materials for Wire and Cable.

H. ASTM D 2794-93 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

I. AWWA C104-08 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

J. AWWA C105-10 - Polyethylene Encasement for Ductile-Iron Pipe Systems.

K. AWWA C110-08 – Ductile-Iron and Gray-Iron Fittings, 3 inch through 48 inch for Water.

L. AWWA C111-07 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

M. AWWA C115-06 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.

N. AWWA C150-08 - Thickness Design of Ductile-Iron Pipe.

O. AWWA C151-09 - Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.

P. ANSI/AWWA C153/A21.53-11 (latest revision) - Ductile-Iron Compact Fittings.

Q. AWWA C 600-05 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

1.04 SUBMITTALS

A. Manufacturer's technical product data for pipe and fittings.

B. Manufacturer’s certifications of product compliance with the referenced AWWA standards.

1.05 QUALITY ASSURANCE

A. Each pipe and fitting must be marked with the following information: weight, pressure or thickness class (as applicable), manufacturer's mark, and the letters "DI" or "DUCTILE".

PART 2 PRODUCTS

2.01 PIPE

A. Manufactured in accordance with AWWA C151.

Size (inches)	Pressure Class	Special Thickness Class
3-20	--	51
24	350	--
30-42	300	--
48-64	250	--

B. Push-on type joints conforming to AWWA C111.

C. Flanged Joints (where specified on the Drawings): Conform to AWWA C115. Ductile iron conforming to the chemical and physical properties specified in AWWA C110. Pipe to be Special Thickness Class 53. Do not thread or flange pipe in the field.

D. All buried water supply pipe shall have a 2-inch wide blue band painted at 5-foot intervals for the length of the pipe and at all bends.

E. All buried wastewater pipe shall have a 2-inch wide green band painted at 5-foot intervals for the length of the pipe and at all bends.

F. On buried reclaimed watermain pipe provide one lavender identification stripe for the entire length of the pipe section for mains less than 12 inches in diameter. Provide 2 stripes for mains 12 inches in diameter and greater.

2.02 FITTINGS

A. Mechanical: AWWA C153 compact fittings with joints conforming to AWWA C111. All buried fittings to be mechanical type.

B. Flanged: AWWA C110 for 3 inch through 48 inch and AWWA C153 for 54 inch through 64 inch. Joints to conform to AWWA C111. All above ground fittings to be flanged.

2.03 COATINGS AND LININGS

A. Cement-mortar lined in pipe used for Potable Water and Reclaimed Water Systems conforming to AWWA C104.

B. Polyethylene Encasement (where specified on the Drawings):

1. Conforms to AWWA C105.

2. 8 mil thick tube or sheet of plastic meeting ASTM D1248.

3. Exposure of wrapped pipe should be kept to a minimum.

C. Epoxy lining for pipes used in wastewater systems.

1. The lining material for pipe and fittings to be Protecto 401. Apply in strict conformance with the manufacturer's recommendations. Provide minimum 40 mils dry film thickness.

D. All buried pipe shall have a 1 mil thick asphalt coating.

E. Exposed pipe shall be factory primed. The primer used shall be compatible with the specified finished coating.

2.04 ACCESSORIES

A. Clamps, straps and washers : ASTM A 506.

B. Rods: ASTM A 575.

C. Rod Couplings: ASTM A 197.

D. Bolts and Nuts: ASTM A 307, Grade B.

E. All bolts, nuts, washers, couplings, rods, clamps, and straps are to be hot-dipped galvanized per ASTM A153.

F. Thrust Blocks: Concrete with a minimum compressive strength of 2500 psi at 28 days. Thrust blocks are allowed only where called for on the drawings.

G. Restrain pipe joints using either 'Field Lok' gaskets as manufactured by U.S. Pipe, 'Fast Grip' gaskets as manufactured by American Ductile Iron Pipe, or approved equal.

H. Restrain fittings using 'Megalugs' as manufactured by Ebaa Iron Sales, Inc.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install ductile iron pipe in accordance with AWWA C600.

B. Clean gaskets, sockets, and spigots of all foreign matter.

C. When ductile iron pipe is cut in the field, smooth the rough cut edge with a grinder or coarse file and bevel the end so that the cut end does not damage the gasket.

D. Lubricate the exposed face of the gasket and the spigot with the pipe and/or fitting manufacturers' recommended joint lubricant.

E. The interior of the pipe must be thoroughly cleaned of all foreign matter before being lowered into the dry trench and kept clean during laying operations by means of plugs or other approved methods.

F. Provide bell holes in the subgrade to accommodate the bells and to insure that the barrels are in contact with the foundation throughout it's full length exclusive of the bell.

G. Restrain from movement all reaction forces at bends (11-1/4 degrees or greater), tees, valves, and plugs by concrete thrust blocks or mechanical restraints as specified on the Drawings.

H. Provide minimum 30 inch depth of cover except where otherwise shown on the Drawings.

I. Coat all bolts, nuts, studs, and other uncoated parts with a coal-tar epoxy coating prior to backfilling.

3.02 CLEANING

A. Upon completion of the pipe installation, the mains are to be cannon flushed and swabbed by forcing under water pressure a soft sided swab through the mains to remove dirt and any other foreign matter.

B. When cannon flushing, achieve a minimum velocity of 2.5 feet per second in the pipe. The duration of the flushing to be sufficient to provide a minimum flush volume equal to three times the internal volume of the pipeline being flushed.

C. The size of the swab is to be the same size as the main. Install launching and exit points as required for each pipe size. The swab is to be Style V, Type B as manufactured by Knapp, Inc. Supply sufficient water pressure to move the swab through the system. Should a single pass reveal, in the Engineer's opinion, an excessive amount of dirt and debris, a second pass may be required at no additional cost to the Owner. The Contractor is responsible for ensuring that all valves are properly opened or closed as appropriate to facilitate the swabbing process. Neither the Owner or the Engineer will be responsible for the swab getting hung up or stuck in a main and any resulting costs for removal.

D. The cost of cannon flushing/swab cleaning, as applicable, is to be included in the cost of the pipe.

3.03 HYDROSTATIC TESTING

A. All pressure mains must be subjected to a pressure and leakage test of at least 2 hours in duration.

B. Test mains after the pipe and fittings are properly restrained but before backfilling the fittings.

C. Contractor must furnish own source of potable water.

D. The length of pipe to be tested at one time must not exceed the length allowed by the controlling utilities company, or 1500 feet, whichever is less.

E. Before applying the specified test pressure, expel air completely from the pipe, valves, and hydrants.

F. Subject pipelines to a gauge pressure of 150 psi. Subject fire service lines to a gauge pressure of 200 psi. The pressure must not vary by more than 5 psi for the duration of the test.

G. Inspect the line being tested. Stop all visible leaks by an approved method regardless of the leakage test results.

H. Maximum leakage allowed will be as set in Section 5.2 of AWWA Standard C600 or as noted on the drawings, whichever is more stringent.

I. If leakage is at a rate in excess of that allowed, the Contractor must tighten the joints or replace the defective Work until the leakage is reduced to within the allowable amount.

3.04 DISINFECTION

A. Disinfect potable water mains in accordance with Section 02675.

3.05 FIELD OBSERVATION

A. Fittings, valves, thrust blocks, mechanical restraints, cannon flushing and swab cleaning are to be observed at the option of the Engineer.

B. Engineer must be present during pressure tests.

C. All pipe and fittings are subject to visual or other inspection by the Engineer at any time. Such sections that do not conform to these Specifications will be rejected when, in the opinion of the Engineer, the methods of manufacture fail to guarantee uniform results, where the materials used are such as to produce inferior pipe, or the pipe and/or fittings are otherwise damaged or defective.

END OF SECTION

SECTION 02628

PVC PIPE (SCHEDULED)

PART 1 GENERAL

1.01 SECTION INCLUDES

A. PVC pipe with a 'scheduled' wall thickness for drainage, water distribution, wastewater collection, and air line systems.

1.02 PAYMENT

A. Payment for PVC pipe, unless otherwise noted, shall be made at the applicable unit prices in the Bid Form and shall be full compensation for all Work involved in the installation.

1.03 REFERENCES

A. ASTM D1784-81 - Rigid PVC Compounds and Chlorinated PVC Compounds.

B. ASTM D1785-83 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40,80, and 120.

C. ASTM D2464-76 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

D. ASTM D2466-78 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

E. ASTM D2467-76 - Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

F. ASTM D2564-80 - Solvent Cements for PVC Plastic Pipe and Fittings.

G. ASTM D2855-83 - Making Solvent Cemented Joints with Poly Vinyl Chloride Pipe and Fittings.

H. ASTM F439-09-Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.

I. ASTM F441/F441M-09-Chlorinated Poly (Vinyl Chloride) CPVC) Plastic Pipe Schedules 40 and 80.

1.04 QUALITY ASSURANCE

A. Pipe shall be marked with the following information: Nominal pipe size and schedule, ASTM designation, pressure rating, manufacturer's name or trademark, and pipe intended for the transport of potable water shall also include the seal or mark of the laboratory making the evaluation for this purpose.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Pipe shall be delivered to the site in such a manner as to provide adequate protection for the pipe.

B. Do not store PVC pipe in a place where it can be exposed to ultraviolet sunlight.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pipe: ASTM D1785 or ASTM F441.

B. Fittings: ASTM D2464, ASTM D2466, ASTM D2467, or ASTM F439.

C. Solvent Cement: ASTM D2564.

D. All PVC Pipe shall be Schedule 80 unless otherwise shown on Construction Drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. The interior of the pipe and fittings shall be kept thoroughly clean.

B. Any pipe and/or fitting found defective shall be removed immediately and replaced with sound pipe.

C. All PVC pipe and fittings shall be installed as detailed on the Drawings.

D. PVC pipe and fittings, unless otherwise noted, shall be joined by solvent weld joints. Solvent weld joints and solvent shall be as recommended by the manufacturer of the pipe.

3.02 TESTING

A. PVC piping systems to be used for water or water solutions shall be pressure tested by the Contractor by filling the lines with potable water and subjecting the line to a gauge pressure of 150 p.s.i. for at least two (2) consecutive hours.

B. PVC piping systems to be used for air lines shall be pressure tested by the Contractor by filling the lines with clean air and subjecting the lines to a gauge pressure of 75 p.s.i. for at least two (2) consecutive hours.

C. There shall be no pressure drop in the PVC lines during the pressure tests.

D. Contractor shall furnish his own sources of potable water and clean air for testing the lines.

3.03 FIELD OBSERVATIONS

A. PVC pipe systems shall be observed at the option of the Engineer prior to covering up and Engineer shall be present during pressure tests.

END OF SECTION

SECTION 02641

GATE VALVES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gate valves with a nominal pipe size of 4 inches and larger.

B. Valve boxes.

1.02 REFERENCES

A. AWWA C509-09 - Resilient-Seated Gate Valves, for Water Supply Source.

B. AWWA C515-09 – Reduced Wall, Resilient – Seated Gate Valves for Water Supply Source.

C. NSF/ANSI 61 – Drinking Water System Components – Health Effects.

1.03 SUBMITTALS

A. Manufacturer's information for valves and valve boxes.

B. Four sets of operation, maintenance and parts manuals.

1.04 QUALITY ASSURANCE

A. Provide valves with manufacturer's name, year of manufacture, valve size, and pressure rating clearly cast on the body of each valve.

B. Provide valves of same manufacturer throughout.

C. Valves shall be rated at 200 psig cold water working pressure.

PART 2 PRODUCTS

2.01 VALVES

A. Suitable for water service.

B. A water passage equal to the nominal diameter of the pipe when fully open.

C. Valve opens when turning counter clockwise. Operating nut or handwheel has an arrow cast in the metal indicating the direction of opening. Nuts shall be constructed of ductile iron and have four flats at the stem connection.

D. For valves located above ground or inside a structure, furnish a hand wheel operator.

E. Valves to have either flanged ends or mechanical joint ends suitable for connecting to the ends of adjoining piping.

F. Prior to shipment from the factory, test each valve by applying it to a hydraulic pressure equal to twice the specified working pressure.

G. All ferrous components shall be ductile iron, ASTM A536.

H. The wedge shall be symmetrical and seal evenly and tightly with flow in either direction and be constructed of ductile iron encapsulated in EPDM rubber.

I. Valves 14-inches diameter and larger shall have spur gearing, if installed vertically or bevel gearing if installed horizontally. The gear box shall be furnished by the valve manufacturer and installed prior to shipment to the project site.

J. All internal and external surfaces of the valve body and bonnet shall have a fusion bonded-epoxy coating, complying with ANSI/AWWA C550, applied electrostatically prior to assembly.

2.04 VALVE BOXES

A. Cast iron construction, adjustable type as manufactured by Tyler-Union or approved equal.

B. Cast in the cover the word 'WATER' or 'SEWER' as applicable.

C. Each valve box shall be covered with a “Debris Cap” as manufactured by SW Services or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install valves with stems upright or horizontal, not inverted.

B. All buried valves must have valve boxes. Depth of box to be suitable for the depth of the valve below grade.

C. Mount valve boxes centered over the operating nut to facilitate ease of operation.

3.02 FIELD OBSERVATIONS

A. All valves constructed underground may be observed at the option of the Engineer prior to backfilling.

END OF SECTION

SECTION 02643

BUTTERFLY VALVES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Butterfly valves, 8 inch through 72 inch in diameter for use in water or reclaimed water systems.

B. Valve boxes.

1.02 REFERENCES

A. ASTM A48-00-Gray Iron Castings.

B. ASTM A126-95-Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

C. ASTM A536-84-Ductile Iron Castings.

D. ANSI/AWWA C504-10 - Rubber-Seated Butterfly Valves, 3 inches through 72 inches.

E. National Sanitation Foundation (NSF) 61-2002-Drinking Water System Components-Health Effects.

1.03 SUBMITTALS

A. Manufacturer's information for valves and valve boxes.

B. Four sets of operation, maintenance and parts manuals.

1.04 QUALITY ASSURANCE

A. Provide valves with manufacturer's name, year of manufacture, class, and valve size either cast on the body or etched on corrosion resistant plates attached to the body.

B. Valves of the same manufacturer throughout.

PART 2 PRODUCTS

2.01 VALVES

A. Conform to the requirements of AWWA C504, Class 150 B and NSF Standard 61.

B. Flanged or mechanical joint ends suitable for connecting to adjoining pipe.

C. Operating nut for buried service. Handwheel for above ground service, actuators where specified.

D. Shaft: Type 304 stainless steel.

E. Body: Gray iron, ductile iron or alloy gray iron, per ASTM A126, Class B or ASTM A536, latest editions.

F. Disc: Made from cast iron per ASTM A126, Class B or ASTM A48, Class 40 for sizes 24-inch in diameter and smaller. Ductile iron per ASTM A536 for sizes 30-inch in diameter and larger. Furnish disc with Type 316 stainless steel seating edge to mate with the rubber seat on the body.

G. Valve seals shall be provided per AWWA C504, 4.2.5 and shall be compatible to the liquid flowing through the valve. EPDM rubber shall be used where chlorine and ammonia are in the waters.

2.02 VALVE BOXES

A. Cast iron, adjustable type.

B. Cast in the cover the word ‘Water’ or ‘Reclaimed Water’.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install valves with stems upright, not inverted.

B. All buried valves must have valve boxes. Depth of box to be suitable for the depth of the valve below grade. Extensions are to be furnished where required.

C. Mount valve boxes centered over the operating nut to facilitate ease of operation.

D. Install valves in accordance with the manufacturer's instructions.

E. Be sure valve interiors and adjacent piping are cleaned of foreign material prior to mating valve to pipe joint connection.

F. Do not deflect pipe at valve joints.

G. For buried valves, install valve boxes so that they do not transmit shock or stress to the valve actuator as a result of shifting soil or traffic load.

3.02 TESTING

A. Valves are to be tested in line with the pipe and shall hold the test pressure for a minimum of two (2) hours with zero leakage. Test pressures should not exceed the pressure rating of the valve.

3.03 FIELD OBSERVATIONS

A. Engineer to review underground valve installations before backfilling.

END OF SECTION

SECTION 02675

DISINFECTING WATER MAINS AND STORAGE TANKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cleaning, disinfecting, and bacteriological testing of water mains.

B. Cleaning, disinfecting and bacteriological testing of water storage tanks (clearwells).

1.02 REFERENCES

A. AWWA C651-05 - Disinfecting Water Mains.

B. AWWA C652-02 - Disinfecting Water Storage Facilities.

C. AWWA B300 - Hypochlorites

D. AWWA B301 – Liquid Chlorine

1.03 SUBMITTALS

A. Bacteriological test results from a Florida certified laboratory.

1.04 SEQUENCING AND SCHEDULING FOR TANKS

A. The interior wet coating shall be properly cured.

B. The interior wet coating shall be washed with potable water.

C. Contractor shall flush and disinfect the tank and connecting piping.

D. The Contractor shall take and send in the samples to the laboratory for testing. The Contractor shall pay for the testing of the initial set of samples. The Contractor shall pay for all subsequent samples and testing, if required.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials for disinfection of the tank shall be as listed in Section 4: Forms of Chlorine for Disinfection of AWWA C652-02.

B. Materials for disinfection of the distribution system shall be as listed in Section 4: Forms of Chlorine for Disinfection of AWWA C651-05.

PART 3 EXECUTION

3.01 CLEANING AND DISINFECTION

A. All potable water mains, fittings, and appurtenances must be thoroughly flushed and cleaned with potable water and disinfected in accordance with AWWA C651-05.

B. Disinfection shall be done after cleaning and pressure or other required testing.

3.02 DISINFECTION OF THE CONNECTING PIPING

A. It is the Contractor's responsibility to flush and disinfect the connecting piping until satisfactory water samples are reported from the Florida certified laboratory. Acceptable methods are the tablet or slug methods as described in AWWA C651-05. The taking and testing of the samples are the responsibility of the Contractor.

3.03 WASHING TANK INTERIOR WET SURFACES

A. After proper curing of the coating on the interior wet surfaces and prior to disinfecting, the Contractor shall wash the tank interior wet surfaces with potable water. The Contractor shall supply an adequate flow of water (20 gpm minimum) with sufficient pressure (60 psi minimum at the nozzle) to wash thoroughly all the interior surfaces, including those surfaces above the high water level. All residue shall be removed from the tank and inlet/outlet pipe.

3.04 DISINFECTION OF THE TANK

A. Disinfection: It is the Contractor's responsibility to flush and disinfect the tank and connecting piping until two or more successive samples taken on two consecutive days show that the samples are satisfactory as reported from the Florida state certified laboratory. Method 2 (Section 4.3.2) of AWWA C652-02 shall be used for the disinfection procedure. Samples shall be taken and tested by the Contractor.

3.05 BACTERIOLOGICAL TESTING FOR STORAGE TANK

A. The Contractor shall take and send in the samples to a State of Florida certified laboratory. The stored tank water shall comply with current State and USEPA standards for organic, inorganic, and biological contaminants as influenced by the operations of the Contractor. One tank of water for the disinfection shall be furnished by the Owner at no charge to the Contractor. Additional water shall be furnished at current municipal water rates charged by the Owner and shall be paid for by the Contractor.

3.06 BACTERIOLOGICAL TESTING FOR WATERMAINS

A. Install sampling taps at the locations shown on the Drawings.

B. Fire hydrants are not to be used in the collection of samples unless approved as an exception by the Engineer.

C. Leave sampling taps running so that samples may be collected by an independent testing laboratory and until satisfactory results are obtained.

D. Two consecutive daily water samples are to be analyzed.

E. Satisfactory samples show the absence of coliform organisms and the presence of a chlorine residual.

F. Should samples be unsatisfactory, Contractor must reflush, re-chlorinate the pipelines, and set up additional sampling with the independent testing laboratory until satisfactory results are obtained.

3.07 FINAL FLUSHING AFTER DISINFECTION

A. Water pipes shall be flushed until the chlorine residual in the flushing water is no greater than that of the source water.

B. Disposal of water with high chlorine residuals must be carefully implemented so as to not harm the environment or persons. If necessary a neutralizing chemical shall be used.

END OF SECTION

SECTION 03001

CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork.

B. Concrete reinforcement and accessories.

C. Cast-in-place concrete.

D. Pre-cast concrete.

1.02 REFERENCES

A. ACI 301-96 - Specifications for Structural Concrete.

B. ACI 318-99 - Building Code Requirements for Structural Concrete.

C. ACI SP-4 (95) – Formwork for Concrete.

D. ASTM A185-97 – Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

E. ASTM A615-01 - Deformed and Plain Billet Steel for Concrete Reinforcement.

F. ASTM A775-01 – Epoxy - Coated Reinforcing Steel Bars.

G. ASTM C31-00 - Making and Curing Concrete Test Specimens in the Field.

H. ASTM C33-01 - Concrete Aggregates.

I. ASTM C39-01 - Compressive Strength of Cylindrical Concrete Specimens.

J. ASTM C42-99 - Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

K. ASTM C94-00 - Ready-Mixed Concrete.

L. ASTM C143-00 - Slump of Hydraulic Cement Concrete.

M. ASTM C150-00 - Portland Cement.

N. ASTM C192-90 - Making and Curing Concrete Test Specimens in the Laboratory.

O. ASTM C260-01 - Air-Entraining Admixtures for Concrete.

P. ASTM C309-98 - Liquid Membrane - Forming Compounds for Curing Concrete.

Q. ASTM D1751-99 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction.

1.03 SUBMITTALS

A. Four copies of the test mix report showing the proportions of cement, aggregate, fine aggregate, water and admixtures.

B. Shop Drawings of pre-cast structures for review prior to fabrication.

PART 2 PRODUCTS

2.01 FORM MATERIALS

A. Conform to ACI 347.

2.02 REINFORCING STEEL

A. Reinforcing Bars: ASTM A615, Grade 60, new deformed billet steel.

B. Welded Wire Fabric: Plain type, ASTM A185.

C. Stirrups and Ties: ASTM A615, Grade 40 or Grade 60.

D. Bar Supports and Spacers: Steel wire with upturned legs. Mortar cubes.

E. Epoxy - Coated Reinforcing Bars: ASTM A775, Grade 60, new deformed billet steel.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I. Type II cement for wastewater structures.

B. Fine and Coarse Aggregates: ASTM C33.

Nominal maximum size of coarse aggregate not larger than:

1 The narrowest dimension between sides of forms, nor
2. 1/3 the depth of slabs, nor
3. 3/4 the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, or ducts.
4. 4 inches.

C. Water: Clean, fresh, and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement.

D. Air Entrainment Admixtures: ASTM C260. 'Darex' by the W. R. Grace Company or approved equal.

E. Curing Compound: ASTM C309, Type 1 or Type 1-D, Class A.

2.04 CONCRETE MIX

A. Mix concrete in accordance with ASTM C94.

B. Compressive Strength: 3000 psi minimum at 28 days for cast-in-place concrete and 4000 psi minimum at 28 days for pre-cast concrete (unless otherwise noted on Drawings).

C. Slump: 5 inches maximum (Vertical Pours)
3 inches maximum (Horizontal Pours)
2 inches minimum (Unless noted otherwise i.e. tremie, curb machine)

D. Mixing water not to exceed 6 gallons per sack of Portland Cement. This includes water entering the batches as surface moisture on the aggregates, which must be deducted from the specified 6 gallons to determine the amount of mixing water for each batch.

E. Contain not less than 5 sacks of cement per cubic yard of concrete for 3000 psi concrete and not less than 6 sacks of cement per cubic yard of concrete for 4000 psi concrete.

F. Air-Entraining admixture to produce 5 percent (+/- 1.5%) entrained air.

PART 3 EXECUTION

3.01 FORMWORK ERECTION

A. Conforms to the shapes, lines, and dimensions of the members as called for on the Drawings.

B. Provide bracing to ensure stability of formwork.

C. Design and construct forms, bracing, and supports to withstand the pressure of freshly placed concrete without bow or deflection.

D. Hand trim sides and bottom of earth forms; remove loose dirt.

E. Coordinate Work on Drawings in forming and setting openings, recesses, chases, sleeves, bolts, anchors, and other inserts.

F. Substantial and sufficiently tight to prevent leakage of mortar. Check forms prior to placing concrete and tighten as required to produce flush surfaces.

G. Tie metal remaining in the concrete to be at least 3 inches back of the concrete face. Plug holes left by the tie ends with grout.

H. Chamfer corners of beams, columns, walls and exposed edges or corners of concrete with 3/4 inch by 3/4 inch wood chamfer strips unless otherwise shown on Drawings.

I. Clean forms and apply form release agents or wet forms prior to concrete placement.

J. Remove forms in such a manner as to insure the complete safety of the structure. Where the structure as a whole is supported on shores, the removable floor forms, beams and girder sides, columns and similar vertical forms may be removed only after concrete has reached 2/3 of its design strength by test and is sufficiently hard not to be injured during form removal. In no case should supporting forms or shoring be removed until the members have acquired sufficient strength to support their weight and the load safely thereon.

3.02 REINFORCEMENT

A. Before placing concrete, clean reinforcement of foreign particles or coatings.

B. Place, support, and secure reinforcement against displacement.

C. Lap welded wire mesh at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

D. Avoid splices at points of maximum stress. Provide sufficient lap to transfer the stress between bars by bond and shear.

E. Make bends for stirrups and ties on bars 5/8 inches in diameter and less, around a pin having a diameter not less than four times the thickness of the bar. Make bends for other bars around a pin having a diameter not less than six times the minimum thickness of the bar, except that for bars larger than one inch but less than 1-3/4 inches, the pin can not be less than eight times the minimum thickness of the bar. Bend all bars cold.

F. Splices and Offsets in Reinforcement: In slabs, beams, and girders, avoid splices of reinforcement at points of maximum stress. Provide sufficient lap to transfer the stress between bars by bond and shear and meet the requirements of ACI 318.

Where changes in the cross section of a column occur, offset the longitudinal bars in a region where lateral support is afforded. Where offset, the slope of the inclined portion should not be more than one in six, and in the case of tied columns, space the ties not more than 3 inches on center for a distance of one foot below the actual point of offset.

G. Protection of Reinforcement: Protect the metal reinforcement by the thickness of concrete indicated on the Drawings. Where not otherwise shown, the thickness of concrete over the reinforcement should be as follows:

Where concrete is deposited against ground without the use of forms, not less than 3 inches for beams and slabs.

Where concrete is exposed to the weather or exposed to the ground but placed in forms, not less than 2 inches for bars more than 5/8 inch in diameter and 1-1/2 inches for bars 5/8 inch or less in diameter.

In slabs and walls not exposed to the ground or to the weather, not less than 1-1/2 inches.
In beams, girders and columns not exposed to the ground or to the weather, not less than 1-1/2 inches.

In all cases, the thickness of concrete over the reinforcement must be at least 1-1/2 inches.

H. Protect reinforcement bars, intended for bonding with future extensions, with approved adequate covering.

3.03 JOINTS

A. Expansion and Contraction Joints: Provide expansion joints when slabs on grade join other construction and elsewhere as indicated. Expansion joints are to be one-half (1/2) inch thick when not otherwise noted. Tool edges of slabs at expansion and contraction joints to a one-fourth (1/4) inch radius.

B. Construction Joints: In jointing fresh concrete to that which has already set, the surface of the concrete in place must be thoroughly cleaned and have all laitance removed by cutting with a suitable tool. In addition, wet and slush with a coat of grout, no leaner than one (1) part cement to two (2) parts sand.

3.04 CONCRETE MIXING

A. Mix until there is a uniform distribution of the materials and discharge completely before the mixer is recharged.

B. For job-mixed concrete, rotate the mixer at a speed recommended by the manufacturer and mix continuously for at least one minute after all materials are in the mixer.

C. Mix and deliver ready-mixed concrete in accordance with ASTM C-94.

D. Wet batches of concrete may be transported in either agitating or nonagitating trucks. When non-agitator trucks are used, the elapsed time between the addition of water to the mix and depositing the concrete in place must not exceed 45 minutes except that when a retardant admixture is used such elapsed time must not exceed 75 minutes. When the handling is done in truck agitators, such elapsed time must not exceed 60 minutes, except that when a retardant admixture is used a maximum elapsed time of 90 minutes will be permitted.

E. When concrete arrives on site with slump below that suitable for placing, as indicated by the Specifications, water may be added only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.

3.05 PLACING CONCRETE

A. Notify Engineer a minimum of 24 hours prior to commencement of concreting operations.

B. Equipment for chuting, pumping and pneumatically conveying concrete must be sized and designed as to insure a practically continuous flow of concrete at the delivery end without separation of the materials.

C. Prevent separation or loss of materials when conveying concrete from mixer to place of final deposit.

D. No concrete that has partially hardened or been contaminated by foreign material may be deposited on the Work nor retempered.

E. Deposit as nearly as practicable to its final position to avoid segregation due to rehandling or flowing.

F. During placement, thoroughly work concrete around reinforcement and embedded fixtures and into the corners of the forms.

G. At all times, concrete is to be plastic and flow readily into the space between the bars.

When concreting is once started, carry on as a continuous operation until the placing of the panel or section is completed. The top surface to be generally level.

H. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use vibrators designed to operate with vibratory element submerged in concrete.

3.06 UNDER-WATER PLACING (Done only on approval of Engineer)

A. When conditions require placing through water, a tremie or drop-bottom bucket should be used and the Work must be well supervised. Every precaution must be taken to prevent the cement from washing out of the concrete. The tremie is to be water-tight and large enough to allow a free flow of concrete. It must be kept filled with concrete at all times while depositing. Discharge concrete and spread by moving the tremie as to maintain as nearly as practicable a uniform flow and avoid dropping the concrete through water. If the charge is lost while depositing, the tremie must be withdrawn and refilled. Maintain concrete slump between 6 and 7 inches. Tremie concrete must be pumped into place instead of gravity placed.

3.07 COLD WEATHER PLACEMENT

A. Provide adequate equipment for heating the concrete materials and protecting the concrete during freezing or near-freezing weather. No frozen materials or materials containing ice can be used.

B. All concrete materials and all reinforcement, forms, fillers and ground with which the concrete is to come in contact must be free from frost. Whenever the temperature of the surrounding air is below 40 degrees F, all concrete placed in the forms must have a temperature of between 70 degrees F and 80 degrees F, and adequate means to provide for maintaining a temperature of not less than 70 degrees F for 3 days or 50 degrees F for 5 days. The housing covering or other protection used in connection with curing must remain in place and intact at least 24 hours after the artificial heating is discontinued. No dependence can be placed on salt or other chemicals for the prevention of freezing.

3.08 HOT WEATHER PLACEMENT

A. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Mixing water may be chilled, or chopped ice may be used to control the concrete

temperature, provided the water equivalent of the ice is calculated to the total amount of mixing water.

B. A shorter mixing time than specified in ASTM C94 may be required. When the air temperature is between 85 and 90 degrees F, reduce the mixing and delivery time from 90 minutes to 75 minutes, and when the air temperature is above 90 degrees F, reduce the mixing and delivery time to 60 minutes.

Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperatures immediately before embedment in concrete. Wet forms thoroughly before placing concrete.

Do not use retarding admixtures without the written approval of the Engineer.

3.09 FINISHING CONCRETE

A. Rough finish for concrete surfaces not exposed to view in the finish Work or covered by other construction.

B. Strike - off smooth and finish with a texture matching adjacent formed surfaces at tops of walls, horizontal offsets and similar unformed surfaces occurring adjacent to formed surfaces.

C. Provide a uniform smooth rubbed finish on exposed formed concrete walls, columns, and beams.

D. Float finish monolithic slab surfaces that are to receive trowel finish or other finish.

1. Trowel Finish: After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/4" in 10 feet when tested with a 10 foot straight-edge. Grind smooth surface defects which would show through applied floor covering system.

2. Non-slip Broom Finish: Apply non-slip fine-hair broom finish to sidewalks, driveways, handicap ramps, curbs, or other items as noted on the Drawings.

3.10 CURING

A. Protect freshly placed concrete from premature drying or heat, and maintain without drying at a relatively constant temperature for a period of time necessary for hydration of cement and proper hardening.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 72 hours.

C. Continue curing for a least 7 days and in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

D. In lieu of moist curing, spray a clear liquid membrane curing compound on all new concrete immediately after initial set. Rate of application to be 200 square feet per gallon or as recommended by the manufacturer.

3.11 TESTS

A. Testing and analysis of concrete will be performed by an independent testing laboratory.

B. Test firm will take cylinders and perform compression tests in accordance with ASTM C31, ASTM C39, and ASTM C192.

C. Number of cylinders and frequency of tests will be designated by the Engineer.

D. One slump test will be performed per ASTM C143 for each set of test cylinders taken.

E. Cure specimens under laboratory conditions except that when in the opinion of the Engineer, there is a possibility of the surrounding air temperature falling below 40 degrees F., additional specimens may be required and cured under job conditions.

F. If the average strength of the laboratory control cylinders for any portion of the structure falls below the compressive strengths called for on the Drawings, the Engineer has the right to order a change in the proportions or the water content for the remaining portion of the structure. If the average strength of the job-cured cylinders falls below the required strength the Engineer has the right to require conditions of temperature and moisture necessary to secure the required strength and may require tests in accordance with ASTM C42, or order load tests to be made on the portions of the structure so affected. Remove or replace failing concrete if directed by the Engineer.

3.12 PROTECTION

A. Protect concrete from damage until final acceptance of Work.

END OF SECTION

SECTION 09900

PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation and application of protective coatings.

B. Interior and exterior coating systems.

1.02 REFERENCES

A. ASTM B117-90 - Salt Spray (Fog) Testing.

B. ASTM D2247-87 - Testing Water Resistance of Coatings in 100% Relative Humidity.

C. ASTM D3359-87 - Measuring Adhesion by Tape Test.

D. ASTM D3363-74 - Film Hardness by Pencil Test.

E. ASTM D4060-84 - Abrasion Resistance of Organic Coatings by the Taber Abraser.

F. ASTM D4541-85 - Pull-Off Strength of Coatings Using Portable Adhesion-Testers.

G. ASTM D4585-87 - Testing the Water Resistance of Coatings Using Controlled Condensation.

H. AWWA C210-84 - Liquid Epoxy Coating System for the Interior and Exterior of Steel Water Pipelines.

I. AWWA D102-78 - Painting Steel Water-Storage Tanks.

J. Steel Structures Painting Council (SSPC) Specifications.

1. SP-1 Solvent Cleaning: Remove all grease,oil, salt, acid, alkali, dirt, dust, wax, fat, foreign matter and contaminates, etc. by one of the following methods: steam cleaning, alkaline cleaning, or volatile solvent cleaning.

2. SP-2 Hand Tool Cleaning: Removal of loose rust, loose mill scale and loose paint to a clean sound substrate by hand chipping, scraping, sanding and wire brushing.

3. SP-3 Power Tool Cleaning: Removal of loose mill scale and loose paint to a clean sound substrate by power tool chipping, descaling, sanding, wire brushing and grinding.

4. SP-5 White Metal Blast Cleaning: Complete removal of all mill scale, rust, rust scale, previous coating, etc., leaving the surface a uniform gray-white color.

5. SP-6 Commercial Blast Cleaning: Complete removal of all dirt, rust scale, mill scale, foreign matter and previous coating, etc., leaving only shadows and/or streaks caused by rust stain and mill scale oxides. At least 66% of each square inch of surface area is to be free of all visible residues, except slight discoloration.
6. SP-7 Brush-Off Blast Cleaning: Removal of rust scale, loose mill scale, loose rust and loose coatings, leaving tightly-bonded mill scale, rust and previous coatings. On concrete surfaces, brush-off blast clean to remove all laitance, form oils and solid contaminates. Blasting should be performed sufficiently close to the surface so as to open up surface voids, bugholes, air pockets and other subsurface irregularities, but so as not to expose underlying aggregate.

7. SP-8 Shop Pickled: Complete removal of rust and mill scale by acid pickling, duplex pickling or electrolytic pickling (may reduce the resistance of the surface to corrosion, if not to be primed immediately).

8. SP-10 Near-White Metal Blast Cleaning: Removal of all rust scale, mill scale, previous coating, etc., leaving only light stains from rust, mill scale and small specks of previous coating. At least 95% of each square inch of surface area is to be free of all visible residues and the remainder limited to slight discoloration.

9. VIS-1 Pictorial Surface Preparation Standards for Painting Steel Surfaces

1.03 ABBREVIATIONS

A. ASTM - American Society of Testing Materials

B. AWWA - American Water Works Association

C. DFT - Dry film thickness.

D. Exterior - Outside, exposed to weather.

E. Interior Dry - Inside, concealed or protected from weather.

F. Interior Wet - Inside, subject to immersion service.

G. NACE - National Association of Corrosion Engineers

H. SSPC - Steel Structures Painting Council

1.04 SUBMITTALS

A. Product data sheets and application instructions.

B. Color samples for selection by the Owner.

C. For each coating application, submit an affidavit from the manufacturer stating that the paint selected is recommended for its intended use.

D. When removal of lead containing paint is part of the Work, submit qualifications such as a copy of a Certification of Training, demonstrating that the person supervising the Work has been trained in removing lead containing paint. In addition, submit a plan for the methods to be employed for surface preparation, containment and ventilation, and collection of debris.

1.05 QUALITY ASSURANCE

A. All Work to be done by skilled and experienced craftsmen.

B. When removal of lead containing paint is part of the Work, the person supervising the Work must be trained in lead paint removal by a nationally recognized training organization. A minimum of 16 hours classroom training is required.

C. The following instruments must be available on the job site for Engineer's use, during all painting activities:

1. Moisture meter.
2. 'Tape' type mill profile micrometer.
3. 'Nordson-Mikrotest' dry film gauge.
4. Tooke - gauge.
5. Sponge type holiday detector.

D. Primers and other undercoat paint must be produced by same manufacturer as finish coats.

E. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers.

B. Container labeling to include manufacturer's name, type of paint, brand name, brand code, batch number, date of manufacturer, shelf life, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.

C. Store painting materials in a clean, dry, well ventilated place, protected from sparks, flame, direct rays of the sun or from excessive heat.

1.07 REGULATORY REQUIREMENTS

A. All coatings used for potable water service must be approved and certified for use by the National Sanitation Foundation (NSF) Standard 61 and conform to AWWA D-102 and AWWA C-210.

B. All coatings must meet the requirements for volatile organic compounds (VOC) of not more than 3.5 lbs/gallon after thinning.

C. Contain, handle, and dispose of all hazardous materials, including but not limited to lead containing paint, resulting from surface preparation and painting, in accordance with all applicable local, state and federal requirements.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Apply paint only on thoroughly dry surfaces and during periods of favorable weather, unless otherwise allowed by the paint manufacturer. Except as provided below, painting is not permitted when the atmospheric temperature is below 50° F, or when freshly painted surfaces may be damaged by rain, fog, dust, or condensation, and/or when it can be anticipated that these conditions will prevail during the drying period.

B. Do not apply coatings unless the surface temperature is a minimum of 5° above the dew point; temperature must be maintained during curing.

C. Dew Point Calculation Chart

Ambient Air Temperature - Fahrenheit

Relative Humidity	20	30	40	50	60	70	80	90	100	110	120
90%	18	28	37	47	57	67	77	87	97	107	117
85%	17	26	36	45	55	65	76	84	95	104	113
80%	16	25	34	44	54	63	73	82	93	102	110
75%	15	24	33	42	52	62	71	80	91	100	108
70%	13	22	31	40	50	60	68	78	88	96	105
65%	12	20	29	38	47	57	66	76	85	93	103
60%	11	29	27	36	45	55	64	73	83	92	101
55%	9	17	25	34	43	53	61	70	80	89	98
50%	6	15	23	31	40	50	59	67	77	86	94

45%	4	13	21	29	37	47	56	64	73	82	91
40%	1	11	18	26	35	43	52	61	69	78	87
35%	-2	8	16	23	31	40	48	57	65	74	83
30%	-6	4	13	20	28	36	44	52	61	69	77

SURFACE TEMPERATURE AT WHICH CONDENSATION OCCURS

D. Suitable enclosures to permit painting during inclement weather may be used if provisions are made to control atmospheric conditions artificially inside the enclosure, within limits suitable for painting throughout the painting operations.

1.09 EXISTING CONDITIONS

A. When unable to inspect the interior surfaces of existing tanks during bidding, assume 25 percent of the area is pitted as defined by the Steel Structures Painting Council.

1.10 EXTRA MATERIALS

A. Provide a one gallon container of each color and surface texture to Owner.

B. Label each container with color, texture, location used, in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. All materials specified herein are manufactured by the Tnemec Company, Inc., North Kansas City, Missouri, unless noted otherwise. These products are specified to establish standards of quality and are approved for use on this Project.

B. Equivalent materials of other manufacturers may be substituted on approval of the Engineer. Requests for substitution must include manufacturer's literature for each product giving the name, generic type, descriptive information and evidence of satisfactory past performance and an independent laboratory certification that their product meets the performance criteria of the specified materials.

C. Performance Criteria

1. Abrasion - ASTM D4060, CS-17 Wheel, 1,000 grams load.

2. Adhesion - ASTM D3359, Method B or ASTM D4541.

3. Exterior Exposure - Exposed at 45 degrees facing the ocean (South Florida Marine Exposure).

4. Hardness - ASTM D3363.

5. Humidity - ASTM D2247 or ASTM D4585.

6. Salt Spray (Fog) - ASTM B117.

D. Substitutions which decrease the film thickness, the number of coats applied, change the generic type of coating, or fail to meet the performance criteria of the specified materials will not be approved. Primer and finish coats on all surfaces must be furnished by the same manufacturer.

2.02 MATERIALS

A. Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating. Good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified. Of commercial quality.

C. Cement - Base Patching: Thorite by Thoro System Products of Miami, Florida.

D. Colors: When not specified, as selected by the Owner.

2.03 EQUIPMENT

A. Use effective oil/water separators on all compressed air lines serving spray painting and sandblasting operations to remove oil or moisture from the air before it is used. Place separators as far as practicable from the compressor.

B. All equipment for application of the paint and the completion of the Work must be in first-class condition and comply with recommendations of the paint manufacturer.

PART 3 EXECUTION

3.01 INSPECTION

A. Applicator must examine areas and conditions under which painting Work is to be completed and notify Engineer in writing of conditions detrimental to proper and timely completion of Work.

B. Inspect the substrate and report any unsatisfactory conditions. Contractor is not responsible for latent defects in the substrate which can not be detected during a reasonable visual inspection. Starting the Work indicates acceptance of the substrate as constructed.

C. All surfaces to be painted are subject to review by the Engineer before application of the prime coat and each succeeding coat. Any defects or deficiencies are to be corrected by the Contractor before application of any subsequent coat.

D. When any appreciable time has elapsed between coats, previously coated areas are to be reviewed by the Engineer. Where surfaces are damaged or contaminated, they are to be cleaned and recoated. Adhere to recoating times of manufacturer's printed instructions.

3.02 SURFACE PREPARATION

A. General: Clean surfaces as specified and in accordance with the manufacturer's recommendation for the coating being used. If surfaces are subject to contamination other than mill scale or normal atmospheric rusting, the surfaces are to be pressure washed, and acid or caustic pH residues neutralized, in addition to the specified surface preparation.

B. Concrete and Masonry: Remove all oil, grease, dirt, laitance and other foreign materials. Blast remove all existing coatings using equipment rated at 3500 psi. Acid etch with a solution of muriatic acid and then rinse with clean water. Verify required acid-alkali balance is achieved. Surface must be dry and free of dust prior to painting. New concrete and masonry must be cured a minimum of 28 days before treating and coating.

Repair damaged concrete using a cement base patching system. Use in strict accordance with the manufacturer's recommendations.

C. Plaster: Remove dirt, loose mortar, scale, chalk, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry.

Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry. Fill hairline cracks, small holes, and imperfections with a latex patching plaster.

D. Gypsum Drywall: Latex fill minor defects. Spot prime after repair. Remove dust from surface by wiping with clean rags or other means.

E. Carbon Steel: Remove all oily and greasy residues in accordance with SSPC-SP1. Blast clean using Dupont's 'Starblast' as the blasting media in accordance with SSPC-SP10. 'Starblast' is the only blasting media allowed to be used. Apply primer coat before any rust bloom forms.

F. Galvanized Steel and Other Non-Ferrous Metals: Surface to be clean and dry. Remove oil, grease, and protective mill coatings by solvent cleaning per SSPC-SP1. Remove white rust from galvanized steel by hand or power brushing. Take care not to damage or remove the galvanizing. Remove rust from old galvanized steel by hand or power tool cleaning in accordance with SSPC-SP2 or SSPC-SP3.

G. PVC Pipe: Remove surface contaminants. Roughen surface by sanding to provide adhesion for primer coat.

H. Wood: Remove dust, grit and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes and cracks. Wood must be clean and dry before application of coating.

I. Fiberglass Reinforced Plastic: Roughen by brush blasting to provide adhesion for primer coat.

3.03 PROTECTION

A. Protect elements surrounding the Work of this Section from damage or disfiguration.

B. Repair damage to other surfaces caused by Work of this Section.

C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

D. Erect, maintain, and dismantle scaffolding without damage to structures, machinery, equipment or pipe. Use drop cloths to protect buildings and equipment.

E. Construct a temporary shroud or cover to contain and collect all spent abrasives and old paint. Dispose of spent abrasives and old paint in accordance with all local, state and federal requirements.

3.04 APPLICATION

A. Apply products in strict accordance with the coating manufacturer's instructions.

B. Apply coating uniformly at the prescribed thickness. Prevent film defects that would adversely affect the appearance or performance.

C. Apply prime coat immediately following surface preparation and in no case later than the same working day. Apply by brushing, paint mitt and roller, conventional spraying, or airless spraying, using equipment approved by the coatings manufacturer.

D. Recoat as per the manufacturer's instructions. Coating is considered recoatable when an additional coat can be applied without any detrimental film irregularities such as lifting or loss of adhesion.

E. Surfaces that will be inaccessible after assembly are to receive either the full specified paint system or three shop coats of the specified primer before assembly.

F. Brushing or rolling is to be done so that a smooth coat as nearly uniform in thickness as possible is obtained. Smooth the film so as not to leave detrimental marks.

G. When using an air, airless or hot spray, apply paint in a uniform layer, with a 50 percent overlap pattern. Brush out all runs and sags immediately or the paint will have to be removed and the surface resprayed.

H. High build coatings should be applied by a cross-hatch method of spray application to ensure proper film thickness of the coating.

I. Surfaces not accessible to brushes, rollers or sprays may be painted by a dauber, sheepskin, or paint mitt.

J. Sand lightly between each succeeding alkyd enamel or varnish coat.

3.05 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Approval from the Owner is required prior to field painting in the vicinity of, or on, energized electrical and rotating equipment, and equipment and/or pipes in service.

B. Exercise extreme care in the painting of operable equipment, such as valves, electric motors, etc., so that the proper functioning of the equipment will not be affected.

C. Degloss factory finish.

D. Do not paint identification markings or code required labels.

E. Match associated piping color with finished paint color. See piping color code.

3.06 CLEANING

A. Contain paint overspray and debris by suitable means, including but not limited to, full shrouding of the area.

B. As Work proceeds, promptly remove paint where spilled, splashed or splattered.

C. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

3.07 COATING SYSTEMS - INTERIOR SURFACES

A. Concrete Floors

1. One coat of Tnemec Series 287 Enviro-Tread (Waterborne Epoxy) applied at 3.0 mils DFT (273 SF/Gal).
2. A second coat of Tnemec Series 287 Enviro-Tread applied at 3.0 mils (273 SF/Gal).
3. Where requested by Owner add or broadcast Series S287-300C (sand) to the 1st coat for a non-slip finish.

B. Masonry Block Walls

1. One coat Tnemec 54-WB surface coat masonry filler. Apply at a minimum rate of 80-100 square feet per gallon to concrete block surfaces only.
2. One coat Series 113 H.B. Tnemec-Tufcoat water-base acrylic epoxy. Apply at a minimum rate of 120-170 square feet per gallon. Two coats will be required if applied by roller.

C. Concrete (including exposed ceilings)

1. Two coats Series 113 H.B. Tnemec-Tufcoat water base acrylic epoxy. Apply at a minimum rate of 120-170 square feet per gallon.

D. Gypsum Drywall

1. One coat Tnemec-cryl Sealer (thinned 10%). Apply at a minimum rate of 400 square feet per gallon.
2. One coat Series 113 H.B. Tneme-Tufcoat water-base acrylic-epoxy. Apply at a minimum rate of 120-170 square feet per gallon. Two coats will be required if applied by roller.

E. Carbon Steel, Ductile Iron, or Cast Iron

1. Prime coat Tnemec Series N69-1211 Epoxoline Primer epoxy-polyamide, 3-5 mils DFT.
2. Finish coat Tnemec Series N69 Hi-Build Epoxoline II epoxy-polyamide, 4-6 mils DFT.

F. Fuel Oil Tanks

1. Prime coat Series 61-5002 Tneme-Liner high solids catalyzed epoxy, 8-12 mils DFT.
2. Finish coat Series 61-5001 Tneme-Liner high solids catalyzed epoxy, 8-12 mils DFT.

G. Galvanized Steel and Other Non-Ferrous Metals

1. One coat Tnemec Series N69 Hi-Build Epoxoline epoxy-polyamide, 4-6 mils DFT.

H. PVC Piping

1. Two coats Tnemec Series N69 Hi-Build Epoxoline epoxy-polyamide. Apply at a minimum rate of 300 square feet per gallon per coat.

I. Shop Finished Electrical and Mechanical Equipment

1. One coat Tnemec Series 27 F/C/ Tu[ppxu (Fast Cire E[pxu), 2-6 mils DFT.
2. One coat Tnemec Series N69 Hi-Build Epoxoline epoxy-polyamide, 4-6 mils DFT.

J. Wood Trim and Doors - Painted

1. Prime coat of Tenemec Series 10-99 W Tnemec primer applied at 2.5 mils DFT (350± SF/Gal)..
2. Two coats of Tnemec Series 23 Enduratone (Semi-Gloss Alkyd Ename) applied at 2.0 mils DFT per coat.

3.08 COATING SYSTEMS - EXTERIOR SURFACES

A. Carbon Steel, Ductile, or Cast Iron

1. Prime coat Tnemec Series 135 (Chembuild Surface Tolerant Epxy), 3-5 mils DFT.
2. Finish coat Tnemec Series 73 Endura-Shield III high build acrylic polyurethane, 2-5 mils DFT.

B. Galvanized Steel and Other Non-Ferrous Metals

1. Prime coat Tnemec Series N69 Hi-Build Epoxoline epoxy-polyamide, 2-3 mils DFT.
2. Finish coat Tnemec Series 73 Endura-Shield III high build acrylic poly- urethane, 2-5 mils DFT.

C. Above Ground Fuel Storage Tanks

1. Shop Primer: One coat Series 90-97 Tneme-Zinc zinc-rich urethane, 2.5-3.5 mils DFT.
2. Field Touch-Up: Series 90-97 Tneme-Zinc, 2.5-3.5 mils DFT.

3. Full first coat Tnemec Series N69 Hi-Build Epoxoline epoxy polyamide, 2-3 mils DFT.
4. Finish coat Tnemec Series 73 Endura-Shield III high-build acrylic polyurethane, 2-5 mils DFT.

D. PVC Piping

1. One coat Tnemec Series N69 Hi-Build Epoxoline epoxy polyamide. Apply at a minimum rate of 300 square feet per gallon.
2. One coat Tnemec Series 73 Endura-Shield III high-build acrylic polyurethane. Apply at a minimum rate of 300 square feet per gallon.

E. Fiberglass Reinforced Plastic

1. One coat Tnemec Series N69 Hi-Build Epoxoline epoxy polyamide. Apply at a minimum rate of 300 square feet per gallon.
2. One coat Tnemec Series 73 Endura-Shield III high-build acrylic polyurethane. Apply at a minimum rate of 300 square feet per gallon.

F. Shop Finished Electrical and Mechanical Equipment

1. Prime coat Tnemec Series 27 F.C. Typoxy (fast cure epoxy), 2-3 mils DFT.
2. Finish coat Tnemec Series 73 Endura-Shield III high-build acrylic polyurethane, 2-5 mils DFT.

G. Masonry Block Walls
1. Block Filler – Tnemec Series 54WB surface coat Masonry Filler applied at 80± SF/Gal.
2. Finish per requirements below.

H. Precast and Cast In Place Concrete
1. Above Grade Coating – Finish per requirements below.
2. Below Grade Coating – Apply one coat Series 46H-413 Hi-Build Theme-Tar (Coal Tar Epoxy), 14.0 to 20.0 mils DFT.

I. Plaster, Above Grade Concrete, and Stucco
1. Prime Coat: Thoro Primer 2K by Thoro System Products of Miami, Florida. Apply at the minimum rate of 200 square feet per gallon.
2. Finish Coats: Two coast Thorosheen by Thoro System Products of Miami, Florida. Apply at the minimum rate of 200 square feet per gallon.
3. See Section 07145 for additional requirements for new or repaired concrete and masonary surfaces.

3.09 PIPING COLOR CODE

Water Lines

Raw	Olive Green
Settled or Clarified	Aqua
Finished or Potable	Dark Blue

Chemical Lines

Alum or Primary Coagulant	Orange
Ammonia	White
Carbon Slurry	Black
Caustic	Yellow with Green Band
Chlorine (Gas and Solution)	Yellow
Fluoride	Light Blue and Red Band
Lime Slurry	Light Green
Ozone	Yellow with Orange Band
Phosphate Compounds	Light Green with Red Band

Polymers or Coagulant Aids	Orange with Green Band
Potassium Permanganate	Violet
Soda Ash	Light Green with Orange Band
Sulfuric Acid	Yellow with Red Band
Sulfur Dioxide	Light Green with Yellow Band

Fuel Oil Lines

Black Oil	Yellow
Diesel	Yellow

Waste Lines

Backwash Waste	Light Brown
Sludge	Dark Brown
Sewer (Sanitary and Other)	Dark Gray

Other

Compressed Air	Dark Green
Gas	Red
Other Lines	Light Gray

3.10 PAINTING SCHEDULE

A. All newly installed equipment, piping, conduit, structures, etc., and appurtenances shall be painted as specified in the Contract Conducts. All colors shall be as approved by the Owner.

B. All existing surfaces modified or damaged as part of this project.

C. Items not to be painted include: Stainless steel items, aluminum items, concrete corrosion prevention liner, and factory painted electrical boxes or similar factory finished items (with approval of engineer) inside of clearwell and fiberglass grating.

END OF SECTION

SECTION 11212

HORIZONTAL SPLIT-CASE HIGH SERVICE PUMPS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Design, manufacture, assemble, install, test, place in satisfactory operation, and start up, horizontal, axially split case, double suction, double volute, variable speed electric motor driven, pump(s) complete with all appurtenances and accessories, whether specifically mentioned in these specifications or not, for use in pumping potable drinking water.

1.02 RELATED SECTIONS

A. Section 16490, “Electric Motors”.

B. Section 09900, Painting

1.03 REFERENCE

A. Design, manufacture and assembly of elements of the equipment herein specified shall be in accordance with, but not limited to, published standards (latest edition) of the following, as applicable:

1. American Gear Manufacturers Association (AGMA)
2. American Institute of Steel Construction (AISC)
3. American Iron and Steel Institute (AISI)
4. American Society of Mechanical Engineers (ASME)
5. American National Standards Institute (ANSI)
6. American Society for Testing Materials (ASTM)
7. American Welding Society (AWS)
8. American Bearing Manufacturers Association (ABMA)
9. Hydraulic Institute Standards (current edition)
10. Institute of Electrical and Electronics Engineers (IEEE)
11. National Electric Code (NEC)
12. National Electrical Manufacturers Association (NEMA)
13. Occupational Safety and Health Administration (OSHA)
14. Steel Structures Painting Council (SSPC)
15. Underwriters Laboratories, Inc. (UL)

1.04 DESIGN/PERFORMANCE REQUIREMENTS

A. Each pumping unit shall meet the following minimum criteria:

PUMP SCHEDULE

ITEM	CRITERIA
Maximum Motor Full Load Speed (rpm)	1800
Motor to be Supplied (hp)	150
Max. Pump Design Speed (rpm)	1775
Suction Size, minimum (inches)	10

Discharge Size, minimum (inches)	8
Minimum Pump Shut-off Head at Design Speed (PSI)	92
Maximum Allowed Pump Horsepower at Design Speed (BHP) at any point on the performance curve (within design operating range)	150
Primary Capacity ("Design Point") (gpm)	2500
TDH at Primary Capacity (PSI)	72
Minimum Pump Efficiency at Primary Capacity (%)	83
Maximum NPSH Required (feet) at PrimaryPump Capacity (feet)	16.8
Capacity at Intermediate TDH (gpm)	3000
Intermediate TDH (PSI)	61
Minimum Pump Efficiency at Intermediate TDH (%)	81
Minimum Capacity at Secondary (design) TDH (gpm)	2000
Secondary TDH (PSI)	80
Minimum Pump Efficiency at Secondary TDH (%)	80
Pump Model Used for Design (Aurora):	411A-8x10x15A

1.05 PERFORMANCE REQUIREMENTS

A. Pumping units shall be located and arranged as shown on the Drawings. Pumping units shall be equipped with invertor duty motors rated for variable frequency drives and base plates.

B. All working parts of the pump and motor, such as bearings, wearing rings, shaft sleeves, motor windings, etc., shall be of standard dimensions, such that parts will be interchangeable between like units, and such that the Owner may at any time in the future obtain replacement and repair parts for those furnished in the original. All parts shall be properly stamped for identification and location as shown on the pump manufacturer's assembly drawings.

C. All nuts, bolts, washers, and other fastening devices supplied with each pump shall be type 316 stainless steel.

D. To assure unit responsibility, all pumps, motors, and base plates shall be furnished and coordinated by a single pump manufacturer. The pump manufacturer shall assume full responsibility for the coordination, testing and operation of the entire pumping system including pump, motor, variable frequency drives and base plates as specified.

E. All pumps shall be of first class workmanship and shall be entirely designed, constructed and installed to be suitable for the intended services (and to operate satisfactorily when installed as shown on the Drawings and as specified herein) and shall be manufactured in accordance with the Hydraulic Institute Standards.

F. All pumps shall conform to the requirements and conditions in the Pump Schedule, as stated herein.

G. The pump manufacturer shall be fully responsible for the design, arrangement and operation of all connected rotating components, of the assembled pumping unit mounted on a fabricated steel baseplate, to ensure that neither harmful nor damaging vibrations occur anywhere within the specified operating range.

1.06 SUBMITTALS

A. Submit manufacturer's complete shop drawings and engineering, including at a minimum:

1. Certified dimensional drawings of each item of equipment and auxiliary apparatus to be furnished
2. Descriptive data, specifications and drawings describing, in detail, the construction of each pump, including parts list and materials of construction, to indicate full conformance with the Contract Documents
3. Pump/Motor Outline and Cutaway Drawings
4. Accessories Drawings
6. Control Drawing and Data
8. Typical Installation Guides
9. Technical Manuals
10. Motor Performance Chart
11. Certified foundation, pump support and anchor bolt plans and details.
12. Schematic electrical wiring diagram and other data as required for complete pump installation.
13. Total weight of pumping unit
14. Parts List
15. Manufacturer's Standard Recommended Start-Up Report Form
16. Certification executed by the pump manufacturer stating that the pumps and variable frequency drive pump controls are totally compatible
17. Statement of design conditions and performance guarantee
18. Statement of warranty
19. Certified copies of the hydraulic performance test reports for each pump as specified in Section 2.14, Quality Control Testing, of this specification
20. Certified motor data and testing reports
21. Tabulated data for the drive motors including rated HP, full load RPM, power factor and efficiency curves at 1/2, ¾, and full load, service factor and KW input, including when the pump is at its design point. Submit a certified statement from the motor manufacturer that the motors are capable of continuous operation on the power supply without affecting their design life for bearings or windings
22. A schedule of the date of shop testing and delivery of the equipment to the job site
23. Description of pump factory test procedures and equipment
24. A statement that the pump will function properly as installed with respect to the suction piping layout as shown on the Drawings
25. Casing test affidavit
26. Written field testing report
27. Pump manufacturer's installation certificate

B. Submit manufacturer's complete Operation and Maintenance Manuals prepared specifically for this installation, including at a minimum:

1. Equipment function, normal operating characteristics, and limiting conditions
2. Assembly, installation, alignment, adjustment, and checking instructions
3. Operating instructions for startup, routine and normal operation, regulation and control, shutdown, and emergency conditions
4. Lubrication and maintenance instructions
5. Guide to "troubleshooting"
6. Parts lists and predicted life of parts subject to wear
7. Outline, cross-section, and assembly drawing; engineering data; and wiring diagrams
8. Test data and performance curves

1.07 TOOLS AND SPARE PARTS

A. One (l) set of all special tools required for normal operation and maintenance shall be provided. All such tools shall be furnished in a suitable steel tool chest complete with lock and duplicate keys.

B. The manufacturers of the equipment specified herein shall furnish a complete set of recommended spare parts as specified herein.

C. Spare Parts shall be properly bound and labeled for easy identification without opening the packaging and suitably protected for long term storage.

1.08 PRODUCT HANDLING

A. All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are operational.

B. All equipment and parts must be properly protected against any damage during shipment or prolonged periods at the site. Equipment shall be stored in accordance with the manufacturer's recommendations.

C. Factory assembled parts and components shall not be dismantled for shipment.

D. Finished surfaces of all exposed pump openings shall be protected by wooden blanks, strongly built and securely bolted thereto.

E. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.

F. After hydrostatic or other tests, all entrapped water shall be drained prior to shipment, and proper care shall be taken to protect parts from the entrance of water during shipment, storage and handling.

G. Each box or package shall be properly marked to show its net weight in addition to its contents.

1.09 FACTORY SERVICE

A. Factory-Approved service facilities with qualified factory-trained mechanics shall be available for prompt emergency and routine service within four hours travel time of this pump station. Submit list of Factory-Approved service facilities meeting this specification, including location, name and phone number to Engineer.

1.10 WARRANTY

A. The pump manufacturer shall warrant, for a period of one year from the date of successful system startup, that each pumping system shall perform as described in the Project Specifications and shall warrant all parts, labor and materials of the pumping systems to be free from defects in workmanship, design or material. The pump manufacturer shall repair, provide replacement, and remove/reinstall the equipment for any defective components under this warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Pumps shall be as manufactured by (or approved equal):

1. Aurora Pumps

B. All equipment specified herein shall be standard catalogued product of a single pump manufacturer who shall assume unit responsibility for proper operation of each pumping unit. The pump manufacturer shall supply the pumps, motors, and base plates and shall be solely responsible for proper operation of all supplied equipment as a pumping system.

2.01 MATERIAL AND EQUIPMENT

A. Each pumping unit shall be complete including pump, motor, base plate and couplings, with proper alignment and balancing of the unit.

B. The base plate for the pump shall be rigidly and accurately anchored into position. The Contractor shall provide all necessary foundation bolts, plates, nuts, and washers for installation. All hardware shall be 316 stainless steel.

C. A stainless steel nameplate giving the name of the manufacturer, model number, serial number, the rated flow capacity, head, speed, horse power, input voltage, amps, number of cycles and power and service factors and all other pertinent data shall be attached to the pump and/or motor, as appropriate.

D. The pumping units shall be designed and constructed to withstand the maximum turbine run-away speed of the unit due to back flow through the pump.

E. The pumps, motors, variable frequency drives, base plates and controls shall be designed and built for 24-hour continuous service at any and all points within the required range of operation, without overheating, without cavitation, and without excessive vibration or strain. All parts shall be designed and proportioned to have liberal strength, stability and stiffness and to be especially constructed to meet the specification stated herein. Ample room and facilities shall be provided for inspection, repairs and adjustment.

F. All materials including coatings in contact with potable water shall be NSF-61 approved.

2.02 PUMPS (GENERAL)

A. General. Each pump shall be of the horizontal, centrifugal, axially split case, double suction, dual volute type and shall be of standard dimensions, built to limit gauges or formed to templates.

B. Performance Requirements:

1. When operating at the maximum output speed of the motor, the pumps shall have a characteristic performance curve, which meets all the minimum conditions listed in the Pump Schedule. The pumps and drive motor shall be capable of operating satisfactorily under the full range of conditions as defined by the Pump Schedule. The primary pump capacity, head and efficiency defined in the Pump Schedule shall be the "design point."
2. Maximum motor speed shall not exceed that listed in the Pump Schedule to satisfy the specified hydraulic duty requirements. The pump "design speed" shall be the maximum output speed of the motor when operating at the "primary" pump capacity and head.
3. With the pumping unit operating at full speed, the maximum brake horsepower required by the pump shall not exceed the maximum horsepower listed in Pump Schedule.

2.03 PUMP CASING

A. Each pump casing shall be a double volute type split along the horizontal shaft centerline with flat-faced suction and discharge flanges and shall be manufactured from ASTM A-48, Class 30 grey cast iron (minimum).

B. Each pump casing shall be free from blowholes, sand pockets or other imperfections.

C. The upper and lower half casings shall be accurately machined and doweled for bolting together and to permit easy removal and accurate replacement of the upper half for inspection and

maintenance. The upper half casing shall be completely removable without disturbing the suction or discharge piping.

D. The interior and exterior surfaces of the casing shall be smooth with matching flanges.

E. The horizontal casing joint shall be a scraped or machined fit, requiring a gasket not more than 0.032-inch thick. These joints shall be made up with stud bolts screwed into the lower casing flange or bolts and nuts. Cap screws will not be considered. Joints shall be fitted with jacking screws.

F. Suction and discharge flanges shall be faced and shall meet ANSI flange thickness, dimension, and bolt pattern requirements. There shall be I.P.T. tapped holes in both the suction and discharge flanges of the pump for test gauge connections.

G. All holes for flange bolts, studs and cap screws in the casing shall be spot faced.

H. The top half of each case at the topmost part shall have a bossed pipe tap opening for mounting priming air chamber and air release valve specified herein. Pipe taps shall be not less than 1/2-inch I.P.T.

I. At the highest part of the case over each suction eye there shall be a pipe tap, not less than 1/2-inch I.P.T. for air release from the suction chambers.

J. The pump casing at both suction inlets to the impellers shall be protected with 416, ASTM A312 stainless steel renewable wearing rings. They shall be of one-piece construction, held rigidly in slots in the case and shall not be held in place by the clamping action of the case alone.

2.04 PUMP IMPELLER

A. Each impeller shall be constructed of cast alpha nickel aluminum bronze material, enclosed double suction type of one-piece construction. Impeller shall be machined outside and smoothly finished on the internal water passages to provide maximum efficiency and shall be hydraulically and dynamically balanced.

B. Each impeller shall be secured axially along the shaft by shaft sleeves and nuts and secured to the shaft through precision fit full-length key. The impeller hub shall have sufficient metal thickness to allow machining for installation of impeller wear rings.

C. Each impeller shall be protected from wear at both suction inlets with renewable Type 316SS stainless steel wearing rings. These rings shall be fastened to the impeller such that they cannot loosen in service.

2.05 PUMP SHAFT

A. The pump shaft shall be of high quality steel, AISI C1045, accurately machined, ground and polished over the entire length, and sized to provide a minimum amount of shaft deflection.

B. Each pump shaft shall be designed to have adequate tensile and yield strength and be of sufficient diameter to carry the maximum loads imposed and to prevent vibration and fatigue.

C. The shaft shall be protected from wear at the seals and from contact with the pumped flow by renewable 316, ASTM AA312 stainless steel sleeves on which the pump seals shall ride.

D. Sleeves shall be fastened to the shaft such as to prevent leakage between the sleeve and the shaft.

2.06. PUMP BEARINGS

A. The weight of the pump shaft and impeller assembly shall be carried on journal or anti-friction bearings at each end of the pump shaft. Bearings shall be cast iron or steel shell, babbitt lined, ring oiling type, split along the centerline of the shaft or oil lubricated, single or double roll tapered type anti-friction bearings designed for an ABMA L-10 life of 100,000 hours for any point within the pump operating conditions specified.

B. The outboard bearing of the pump shall be designed to support the weight of the rotating assembly and accept all thrust loads and shall function so that the impeller rotor will be centered in the end play (axial movement) of the wearing rings.

C. At the inner end of each bearing housing the shaft shall be equipped with a slinger type water deflector, fastened to the shaft with set screws, to prevent water from the seals from entering the bearing housings. Over the seals, and supported by the bearing brackets, shall be provided readily removable 3316L, stainless steel spray guards so designed and fabricated that any water spray from the seals or shaft will be deflected into the drip pockets.

2.07. MECHANICAL SEALS

A. The pump shall be equipped with mechanical seals, John Crane Type I or equal by Chesterton. The seals shall be stationary seal type. Seal material shall be metallurgy 316 stainless steel, stationary face with pure 658 RC carbon graphite, rotating face solid carbide, spring hastelloy “C”, O-rings fluorelastomer and gasket.

B. The seals shall have motion capability of 0.250-inches radially and axially.

2.08. SPARE PARTS

A. Minimum numbers of spare parts to be furnished for each pump:

1. 2 - complete sets of gaskets
2. 2 - sets of mechanical seals with glands, bolts, nuts & washers
3. 1 - complete set of shaft sleeves, keys and accessories
4. 1 - spare coupling with all components

2.09. GAUGES

A. Each pump shall be equipped with suction and discharge gauges. The pump manufacturer shall provide taps in the suction and discharge flanges to accommodate the gauges as specified herein.

B. The pump discharge gauge shall be dual scale and shall be calibrated 0-100 psi and 240 feet of water. The pump suction gauge shall be calibrated minus 34 feet of water to plus 34 feet of water. Gauges shall have 6-inch diameter dials. Gauge cases shall be 316 stainless steel, flanged mounted, back or bottom connected with "snap-on" ring or bezel. Bourdon tubes shall be of 316 stainless steel. The pointers shall be adjustable for field calibration and setting.

C. The pump discharge gauge shall be equipped with a surge suppression snubber. Each gauge shall be equipped with a lever handle gauge cock and union, both of 316 stainless steel construction

D. Connection of the gauges to the pressure taps in the pump flanges shall be with screwed brass pipe neatly installed with straight runs and right angle bends.

E. Gauges shall be Trerice Model 600, by Marshalltown or Model 150000-4 series, by Amtek, U.S. Gauge Division.

2.10. COUPLINGS AND ACCESSORIES

A. The pump manufacturer shall select and supply suitable couplings sized, based on lateral critical, torsional critical and/or other computations, so that operating speed is a minimum of 10% below one-half critical speed or critical speed which could cause damage to the rotating equipment.

B. The pump manufacturer shall provide adequate protective 316 stainless steel screening around the rotating shaft and couplings to meet OSHA and Florida Industrial Safety Laws.

C. Couplings shall be as manufactured by T.B. Woods Company or approved equal.

2.11. BASE PLATES

A. Each pumping unit shall be mounted on an extended fabricated steel base plate, with provision to collect leakage, and shall be of sufficient size and rigidity to support the pumping unit and prevent harmful or damaging vibration. A 3/4-in drain tap and 316 stainless steel pipe nipple shall be provided. The steel base shall be anchored to the level surface of a concrete pad with suitably sized 316 stainless steel anchor bolts. Base shall have a 6-inch diameter hole below the coupling area to facilitate grouting. After installation, startup, and testing the base shall be filled with concrete grout.

B. The natural frequency of the assembled pump and its supporting structure shall be at least 25 percent higher than the maximum pump speed.

2.12. SHOP PAINTING

A. Before exposure to weather and prior to shop painting, all surfaces shall be thoroughly cleaned, dry and free from all mill-scale, rust, grease, dirt and other foreign matter.

B. All pumps and motors shall be shop primed with a primer compatible with field painting.

C. Stainless steel materials shall not be coated. All name plates shall be protected.

D. Gears, bearing surfaces, and other similar surfaces obviously not to be painted shall be given a heavy shop coat of grease or other suitable rust resistant coating. This coating shall be maintained as necessary to prevent corrosion during periods of storage and erection up to the time of the final acceptance test.

2.13. QUALITY CONTROL TESTING

A. General Factory Testing

1. Factory tests shall be performed by the pump manufacturer and certified performance curves certified by a Professional Engineer as correct and shall be submitted prior to shipment. Factory testing shall be performed in accordance with the standards of the Hydraulic Institute, NEMA and IEEE, except as modified herein, and shall be required for each pump. Certified pump performance curves shall include, at a minimum, head, capacity, brake horsepower, speeds, pump efficiency and motor efficiency for each pump for the various conditions under which the pumps shall operate, including shut-off head. Certified performance curves shall be submitted at minimum, intermediate and maximum operating speeds.
2. In the submittal, the pump manufacturer shall submit information which fully describes the pump manufacturer's factory testing facilities, and a list of test equipment and test procedures.
3. All electronic transducers, meters, gauges, and test instruments shall be calibrated within 30 days prior to the factory test and certified calibration data shall be provided. Differential pressure type flow meters, such as Venturis, are preferred. Mechanical Certification is acceptable.

4. In case of failure of any pumping unit to meet the performance requirements of the Contract Documents, the pump manufacturer shall make such alterations as are necessary, and all tests shall be repeated without additional costs to the Owner or Engineer.

B. Pump Factory Testing

1. Pump impeller, motor rating and electrical connections shall be checked for compliance with the Contract Documents.
2. Mechanical and electrical integrity established by physical inspection and by use of a megger.
3. Hydrostatic tests of each pump casing shall be performed in accordance with Hydraulic Institute standards at a pressure at least 1 ½ times the maximum pump shut-off head. Tests shall be certified by a Professional Engineer that there was no evidence of leakage and shall be furnished to Engineer before shipment.
4. Each pump shall be factory tested through the full specified speed range of flow vs. head/capacity/efficiency. During each test, the pumping unit shall be run at each head/capacity condition as specified in the Pump Schedule for sufficient time to accurately determine flow, head, power input, and pump efficiency. Each pump shall be tested with a suction head (including vapor pressure, velocity head friction loss and static suction head) as required to demonstrate the NPSH required by the pump at the primary operating point listed in the Pump Schedule.
5. Factory tests shall be full scale/full speed, no exceptions allowed.

C. Pump Field Testing

1. After the installation of the pumps, controls and all appurtenances, each pumping unit shall be field tested, as previously specified herein, under actual operating conditions. The field tests shall be conducted by the Contractor under direct supervision of a Qualified Manufacturer's Technical Representative, and in the presence of, and as directed by the Engineer and Owner. The factory tests are the basis of equipment efficiency demonstration. The field test shall demonstrate correct mechanical operation after pump startup. The Contractor shall provide, calibrate and install all temporary gauges and meters, shall make necessary tapped holes in the pipes, and install all temporary piping and wiring as may be necessary for field testing. Contractor shall also supply all labor, equipment and incidentals required to complete the field tests. Power and water shall be furnished by the Owner. A 24-hour continuous operating period of the pump will be required before acceptance.
2. In case of failure of any pump to meet the performance requirements of the Contract Documents, the pump manufacturer shall make such alterations as are necessary, and all tests shall be repeated without additional costs to the Owner or Engineer.
3. A written report of field testing shall be submitted to Engineer.

2.14. MOTORS

A. Motors shall be furnished by the pump manufacturer and shall be as specified in Section 16490, "Electric Motors".

B. The motors shall be provided with, and mounted to, the fabricated stainless steel base plate.

C. Motors shall be U.S. Electric "Coro-Duty" TEFC enclosed, premium efficiency design with severe duty features: Motors shall be suitable for inverter duty use and shall have 120 volt space heaters.

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PART 3 - EXECUTION

3.01 INSTALLATION

A. The pump manufacturer shall submit a certificate stating that the Coontractor's installation of the equipment is satisfactory, that the equipment is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication and care of each unit.

3.02 INSPECTION, STARTUP AND TESTING

A. The pump manufacturer shall furnish the services of a competent and experienced Qualified Manufacturer's Technical Representative who has complete knowledge of proper operation and maintenance of the equipment to adequately supervise the installation and testing of all equipment, as specified herein, furnished under this Contract and instruct the Contractor's personnel and the Owner's operating personnel in its maintenance and operation.

B. The Qualified Manufacturer's Technical Representative shall be at the job site for the following time period as a minimum; travel time excluded:

1. Eight hours for inspection and certification of the installation.
2. Sixteen hours to carryout performance field testing and startup and to train Owner's operation staff in operation of the system. At least eight hours shall be allocated solely to the instruction of plant personnel in operation and maintenance of the equipment. This instruction period shall be scheduled at least ten days in advance with the Owner and shall take place prior to plant startup and acceptance by the Owner.
3. Eight hours for warranty period inspection.
4. The above time shall be provided over multiple site visits to allow each pump to be started up and tested at different time periods.

C. The Qualified Manufacturer's Technical Representative shall sign in and out with the Engineer's Resident Representative on each day present at the job site.

END SECTION

SECTION 13000

PLANT SCADA CENTRAL SYSTEM UPGRADE

PART 1: GENERAL

1.01 SCOPE OF WORK

A. A single preapproved System Supplier shall furnish all services and equipment defined herein.

B. The System Supplier shall provide all labor, materials, installation, programming, calibration, testing, equipment, training, O&M manuals, warranty, and incidentals that are required to furnish, install, commission, and warrant a fully integrated and functional system.

C. The System Supplier shall design and coordinate the SCADA central system for proper operation with related existing equipment.

D. Auxiliary and accessory devices necessary for proper system operation and performance, such as communications/network interfaces with existing equipment shall be included whether they are specified or not.

E. The City of Lake Worth's SCADA System is existing, and all work shall be coordinated with its operating personnel to minimize impact on its daily operation. The System Supplier shall note that the SCADA system shall be kept operational at all times.

F. Hardware shall be fabricated, assembled, installed, and placed in proper operating conditions in full conformity with the instructions and recommendations of the equipment Manufacturer as approved by the Engineer.

G. To facilitate the Owner's future operation and maintenance, similar products shall be of the same Manufacturer.

H. All equipment and installations shall satisfy applicable Federal, State, and local codes.

I. Equipment removed during the course of this work shall remain the property of the Owner.

J. All materials, equipment, labor and services necessary to achieve the monitoring and control functions described herein shall be provided in a timely manner such that the monitoring and control functions are available when the equipment is ready to be placed into service.

1.02 SUBMITTALS

A. All submittals defined herein shall be submitted for review and approval unless otherwise noted.

B. These shop Drawings shall fully demonstrate that the equipment and services to be furnished will comply with the provisions of these specifications and shall provide a true and complete record of the equipment as manufactured and delivered. Submittals shall be bound in separate three-ring binders, with an index and sectional dividers, with all Drawings reduced to a maximum size of 11-in x 17-in for inclusion within the binder.

C. SCADA Central System Hardware

1. This submittal shall provide complete documentation of the proposed hardware including:

   a. A complete system block diagram(s) showing in schematic form, the interconnections between major hardware components such as; power supplies, consoles, computer and peripheral devices, telemetry equipment, local digital processors and like equipment. The block diagram shall reflect the total integration of all digital devices in the system and shall reflect any man/machine interface locations. All components shall be clearly identified with appropriate cross references to the location of each. The diagram shall reference all interconnecting cabling requirements for digital components of the system including any data communication links.

   b. Manufacturer's device data sheet for each hardware component listing all model numbers, optional, auxiliary and optional devices that are being provided and are available. The data sheets shall be provided with an index and proper identification and cross referencing. They shall include but not be limited to the following information:

      1) Product (item) name used herein.
      2) Manufacturer 's complete model number.
      3) Location of the device.
      4) Input - output characteristics.

   c. Equipment specification sheets which shall fully describe the device, the intended function, how it operates and its physical environmental and performance characteristics. As a minimum the specification sheets shall include the following:

      1) Dimensions and working clearances.
      2) Mounting or installation details.
      3) Connection diagrams.
      4) Electrical power requirements (volts, amps).
      5) Environmental characteristics.
      6) Performance characteristics.

D. Digital System Software

1. The Software Functional Design submittal shall provide a complete description of the system on a functional level prior to software code development. The software shall be organized into functional subsystems. The intent of the Software Functional Design submittal shall be to describe, in detail, what functions are to be performed by each subsystem. It is not the intent of this documentation to describe the individual programs that support these functions.

2. The Software Functional Design submittal shall include, but not be limited to, the following items for each subsystem:

   a. Subsystem Abstract - A brief overview of the subsystem which shall describe its major functions.

   b. Technical Description - A description of all the functions to be performed by the subsystem. This description shall indicate how the functions work from a user's standpoint.

c. Subsystem Structure - A diagram of the overall subsystem indicating major modules, data structures, and data flow. It shall also be defined whether the function is performed in the central system, a remote unit or both.

d. Interface Structure - A diagram and/or description of the manner in which the subsystem interfaces with other subsystems.

e. Man-Machine Interface Consideration - A detailed description of all interface between the system and the operator shall be provided. All related CRT formats shall be shown.

f. Initialization Considerations - A description of the impact of power fail or system fail-over type restarts upon the subsystem shall be described.

g. Proposed computer screens for the central station computer shall be provided for review and comment prior to completion of the programming. Changes shall be made as requested at no additional cost.

1.03 QUALITY ASSURANCE

A. The System Supplier shall be the following SCADA system Manufacturer:

1. C.C. Controls Corporation; Jupiter, Florida

1.04 FINAL SYSTEM DOCUMENTATION

A. Prior to final acceptance of the system and Owner training, operating and maintenance manuals covering instruction and maintenance on each type of equipment shall be furnished.

PART 2: PRODUCTS

2.01 GENERAL

A. All equipment and software supplied shall be standard products of the Manufacturer's latest revision, as of Contract Substantial Completion.

B. All electronic equipment shall be FCC Class A and B approved and shall incorporate RFI protection.

C. All equipment shall be provided with mounting hardware as required.

D. The computer equipment shall be installed in an air-conditioned area; however, the equipment furnished shall be designed to operate satisfactorily between 60 degrees F and 85 degrees F and up to 90 percent relative humidity assuming no condensation will occur.

E. All equipment shall be designed to operate on a 60 Hertz alternating current power source at a nominal 117 volts, plus or minus 10 percent, except where specifically otherwise noted.

F. Equipment and components used shall be UL listed. Custom fabricated equipment shall require the entire equipment to be UL labeled.

G. All equipment shall be designed and constructed so that in the event of a power interruption, orderly shutdown occurs and normal operation is resumed without manual resetting when power is restored.

H. The System Supplier shall provide all hardware and software necessary to provide a fully debugged and operating system, to efficiently perform the functions specified, and to enable convenient and efficient preparation of new programs. This requirement includes all programming and software necessary to interface the system to any existing system or equipment.

I. The software package shall be modular, primarily comprised of an integrated group of proven, standard software modules. Individual standard modules shall be designed such that adaptation to the System's specific needs would be accomplished through entry of definitive data in stored parameter tables.

J. The System Supplier shall assume complete responsibility for the successful operation of all software and application programs provided as part of the System. All programs shall be completely debugged and operable prior to delivery of the System. The Owner shall not be required to expend any programming effort in order to achieve a fully operational system.

K. All of the programs shall be generalized in nature such that the Owner may later add new functions. The scheduling and initiation of future application programs and the servicing of their input and output requirements, including construction of new printing formats and other system interfaces, shall be accomplished without recompiling of existing application software.

L. All real-time executive and/or operating system software procured from sub-vendors shall be unmodified.

M. Programmable Read Only Memory (PROM) resident software shall not include data which may change due to system reconfiguration (e.g. data I/O lists, scan tables, control algorithms, etc.)

N. All application programs shall be provided in the form of field proven, modular software packages for monitoring and control, data collection, analysis, and short term storage, and entry of processed data into the system database. Operator input or response statements shall not require knowledge of programming languages.

O. All software requiring a license shall be filled out by the System Supplier and documented in the Operation & Maintenance Manuals.

P. All hardware installed to obtain the necessary I/O between the field equipment and the central station computer shall match existing equipment.

Q. Make all wiring terminations to existing PLC’s for the required I/O signals and provide a table of wire and terminal numbers versus function

2.02 SYSTEM HARDWARE

A. I/O Modules

1. Provide and install additional digital and analog Input/Output Modules within the existing PLC as necessary for the project. The existing PLC is a Square-D Sy/Max 400 with two (2) square slots remaining on the existing rack. Provide and install another PLC rack including power supply and additional I/O modules as necessary for the project.

2.03 SYSTEM PROGRAMMING

A. The following control strategies and parameters described herein are written descriptions of the programming required to implement the operation of the entire system. The programming shall be implemented within the central station computer as required to provide the following control and status/alarm reporting functions:

1. High Service Pump VFD's No. 3 & No. 4

a. Drive Control Switch in Auto position (DI).
b. Drive running (DI).
c. Drive Fail (common DI).
d. Drive speed output (AI).
e. Drive speed input (AO).
f. Drive start/stop (DO)

2. The High Service Pump (HSP) control system shall control the pumps to maintain a preset but adjustable pressure within plus or minus 2 psi under normal running conditions. If any pump is in the "off" position the control system shall bypass the pump and continue with the next pump in the sequence.

a. On falling pressure, the HSP control system shall start pumps in the following suggested order. Ramp up VFD driven pumps to maintain set pressure. Note that all pumps are VFD driven except pump no. 5. Note that running all pumps in stage 7 would be an unusual circumstance, but should be provided for in the control programming. The flow range provided is approximate and will vary with system pressure set point. (A higher pressure set point will result in a slightly reduced flow.)

Stage	**High Service Pump No.**	**Approximate Flow Range, GPM**
1	3 or 4	2,000 – 3,000
2	1 or 2	4,000 – 6,000
3	1 or 2 + 3 or 4	6,000 – 9,000
4	1 or 2 + 5	8,000 – 10,000
5	1 or 2 + 5 + 3 or 4	10,000 – 13,000
6	1 or 2 + 5 + 3 + 4	12,000 – 16,000
7	All Pumps	16,000+

b. If pressure continues to fall after the pumps in stage 6 are running, the HSP shall sound an alarm for operator intervention.

c. All pumps shall shut down upon low clearwell level and an alarm shall sound.

d. Each consecutive start of a like sized pump shall alternate to the lag pump.

e. On rising pressure, the HSP control system shall duplicate the above steps in reverse order, varying the speed and turning pumps off until the reduced demand is met. The control system may also consider flow range for each pump or combination of pumps and minimum speed for turning pumps off.

f. An adjustable high pressure set point shall sound an alarm for operator intervention in the event that the pressure set point is reached.

g. An adjustable high-high pressure set point (emergency set point) shall shut the pumps down to protect the system and sound an alarm.

h. Every day at 1:00 a.m. (time shall be adjustable) the HSP control system shall step through the above steps in reverse order until the last pump is shut down. All pumps shall remain off until the pressure reaches a preset but adjustable level. The initial setting shall be 55 psi. The start time for this procedure shall also be adjustable. The goal of this control step is to turn the water over in the south elevated water tank during low flow time periods.

i. If all pumps are still shut down at 3:00 a.m. (time shall be adjustable) and the pressure has not reached the preset level (initially 55 psi), the HSP control system shall resume alternating pumps per stages 1 through 7 above. The goal of this procedure is to have a full elevated tank before the start of the morning peak flow time frame (or by approximately five o'clock).

j. The System Supplier shall coordinate with the Engineer and Owner regarding such items as minimum pump run speeds, etc.

k. During the test and demonstration period the control system supplier shall recommend adjustments to the above control logic as may be necessary or desirable for the desired operation of the HSP system.

PART 3: EXECUTION

3.01 GENERAL

A. Two complete sets of approved shop drawings shall be kept at the job site during all on-site construction. Both sets shall be identically marked up to reflect any modifications made during field installation or start-up. All markings shall be verified and initialed by the Engineer or his designated representative. Following completion of installation and the field acceptance test, one set of the marked up drawings shall be provided to the Engineer, the other retained by the System Supplier for incorporation of the mark-ups into final as-built documentation.

3.02 TESTS (GENERAL)

A. The System Supplier shall test all equipment at the factory prior to shipment. Unless otherwise specified in the individual specification sections, all equipment provided by the supplier shall be tested at the factory as a single fully integrated system.

B. As a minimum, the testing shall include the following:

1. Unwitnessed Factory Test (UFT).

2. Field Acceptance Tests (FAT).

3. 15-Day Site Acceptance Tests (SAT).

C. Each test shall be in the cause and effect format. The person conducting the test shall initiate an input (cause) and, upon the system's or subsystem's producing the correct result (effect), the specific test requirement will have been satisfied.

D. All tests shall be conducted in accordance with prior ENGINEER-approved procedures, forms, and check list. Each specific test to be performed shall be described and a space provided after it for sign off by the appropriate party after its satisfactory completion.

E. Copies of these sign off test procedures, forms, and check lists will constitute the required test documentation.

F. Provide all special testing materials and equipment. Wherever possible, perform tests using actual process variables, equipment, and data. Where it is not practical to test with real process variables, equipment, and data, provide suitable means of simulation. Define these simulations techniques in the test procedures.

G. The System Supplier shall coordinate all of his testing with him, the Engineer, and the Owner.

H. The Engineer reserves the right to test or retest all specified functions whether or not explicitly stated in the prior approved Test Procedures.

I. The Engineer 's decision shall be final regarding the acceptability and completeness of all testing.

J. The System Supplier shall furnish the services of servicemen, all special calibration and test equipment and labor to perform the field tests.

3.03 UNWITNESSED FACTORY TESTS (UFT)

A. All SCADA central system hardware and software shall be operated for at least two days continuously without a failure to verify the system is capable of continuous operation.

B. All deficiencies identified during tests shall be corrected and retested prior to shipment of the equipment.

3.04 FIELD ACCEPTANCE TEST (FAT)

A. Once the equipment has been started up and is operating, a witnessed Field Acceptance Test shall be performed on the complete system to demonstrate that it is operating and in compliance with these Specifications. Each specified function shall be demonstrated on a paragraph-by-paragraph, and site-by-site basis.

B. One copy of all O&M Manuals shall be made available to the Engineer at the job site both before and during testing.

C. The system shall operate for a continuous 100 hours without failure before this test will be considered successful.

3.05 15-DAY SITE ACCEPTANCE TEST (SAT)

A. After completion of the Field Acceptance Tests, the system shall be operated for a period of 15 consecutive days, under conditions of full operation, without a single non-field repairable malfunction.

B. During this test, operating and System Supplier personnel shall be present as required. The System Supplier is expected to provide personnel for this test who have an intimate knowledge of the hardware and software of the system.

C. While this test is proceeding, the Owner shall have full use of the system. Only operating personnel shall be allowed to operate the equipment.

D. Any malfunction during the test shall be analyzed and corrections made by the System Supplier the Engineer and/or Owner will determine whether any such malfunctions are sufficiently serious to warrant a repeat of this test.

E. Any malfunction, during this 15 consecutive day test period, which cannot be corrected within 24 hours of occurrence by the System Supplier's personnel, or more than two similar failures of any duration, will be considered as a non-field-repairable malfunction.

F. Upon completion of repairs, by the System Supplier, the test shall be repeated as specified herein.

G. In the event of rejection of any part or function, the System Supplier shall perform repairs or replacement within 90 days.

H. All data base errors must be corrected prior to the start of each test period. The 15-day test will not be considered successful until all data base is correct.

I. The total availability of the system shall be greater than 99.5 percent during this test period. Availability shall be defined as "Avail.=((Total Time-Down Time)÷(Total Time))*100". Down times due to power outages or other factors outside the normal protection devices or back-up power supplies provided, shall not contribute to the availability test times above.

J. Upon successful completion of the 15-day Site Acceptance Test and subsequent review and approval of complete system final documentation, the system shall be considered substantially complete and the one year warranty period shall commence.

3.06 TRAINING

A. The cost of training programs to be conducted with Owner's personnel shall be included in the Contract price. The training and instruction, insofar as practicable, shall be directly related to the System being supplied.

B. The System Supplier shall provide detailed manuals to supplement the training courses. The manuals shall include specific details of equipment supplied and operations specific to the project.

C. The System Supplier shall make use of teaching aids, manuals, slide/video presentations, etc. After the training services, such materials shall be delivered to Owner.

D. The training program shall represent a comprehensive program covering all aspects of the operation and maintenance of the system.

E. All training schedules shall be coordinated with, and at the convenience of the Owner. Shift training may be required to correspond to the Owner's working schedule.

F. On-Site Training: On-site (field) training shall be conducted at the Owner's site and shall provide detailed hands-on instruction to Owner's personnel covering system debugging, program modification, trouble-shooting, maintenance procedures, calibration procedures, and system operation. The training shall run at times chosen by the Owner. A total of 8 hours (1 day) of training shall be provided.

END OF SECTION

SECTION 13420

SLANTING DISC CHECK VALVES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Slanting disc check valves with a nominal pipe size of 2 inch through 24 inch.

1.02 REFERENCES

A. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 inch through 24 inch NPS. (For testing requirements.)

1.03 SUBMITTALS

A. Detailed manufacturer's information for valves.

1.04 QUALITY ASSURANCE

A. Provide valves with manufacturer's name, year of manufacture, valve size, working water pressure, and flow direction arrow clearly cast on the cover or body of each valve.

PART 2 PRODUCTS

2.01 VALVES

A. The Contractor shall furnish and install in the locations as shown on the drawings slanting disc check valves with 316 stainless steel trim, top mounted dashpot, suitable for potable water service.

The body shall be heavy two (2) piece ductile iron construction and not fabricated steel. The two (2) body halves shall be o-ring sealed and bolted together, in a manner to capture the seat on a 55º angle. Each body half must have an access covered hole for internal inspection. The seat ring and disc ring must be of the design that permits replaceability in the field without need for special tools or machining. The pivot pins in the body and bushings in the disc lugs must be stainless steel of different hardnesses to prevent galling. The area throughout the valve body must be equal to full pipe area. The area through the seat section shall be 40 percent larger than the inlet and outlet of the valve to achieve lowest headloss. Disk stabilizers shall be cast into the valve body.

B. The valves furnished shall have a Top Mounted Dashpot that shall provide for controlled opening and non-slam closing to minimize surge and water hammer. The dashpot must be a self-contained oil system, separate and independent from the pipeline media.

Opeing and closing speeds shall be independently adjustable by a color-coded micrometer type control valves. An internal adjustable cushion chamber in the head of the cylinder shall be provided for slower speed during the last few degrees of disc closing.

The oil reservoirs shall be 316 stainless steel per ASTM A240. Hydraulic hoses are to be S.A.E. certified.

C. All materials of construction to be certified in writing to conform to ASTM specifications as follows:

Body & Cover	Ductile Iron	ASTM A536, Grade 65-45-12
Disc	Ductile Iron	ASTM B536,
Seat ring & disc ring	316 Stainless Steel	ASTM A296
Pivot pins	Stainless Steel	ASTM A582, T303
Pivot Pin Busings	Stainless Steel	ASTM A269, T304
Exterior Paint	Phenolic Primer Red Oxide	NSF Approved
Interior Paint	Fusion Bonded Epoxy	NSF Approved

D. All valves shall be warranted by the Manufacturer to be free from defects in materials and/or workmanship for a period of five (5) years from date of final acceptance.

E. Valves shall be provided with a valve disc position indicator and a Nema 4 SPDT limit switch to interface with the instrumentation system.

F. All valve materials shall be suitable for use in chlorinated and chloriammoniated waters.

2.02.1 MANUFACTURER

A. Valves shall be Apco Model CSD-TMD, Series 800T, as manufactured by Dezurik; Crispin TD Series, Berwick, PA, or equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with the manufacturer's recommendations.

END OF SECTION

SECTION 16050

ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Division.

1.02 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required for a complete electrical system as hereinafter specified and shown on the Drawings. Electrical work to be performed under this Contract includes, but is not limited to, the following:

1. Provide and install all equipment, conduit, and wiring for the electrical work indicated on the electrical drawings in accordance with Division 16 of the specifications.

B. The work, apparatus and materials which shall be furnished under these Specifications and accompanying Drawings shall include all items listed hereinafter and/or shown on the Drawings. Certain equipment will be furnished as specified in other Sections of these Specifications which will require wiring thereto and/or complete installation as indicated. All materials necessary for the complete installation shall be furnished and installed by the Contractor to provide complete power, communication systems, instrumentation, wiring and control systems as indicated on the Drawings and /or as specified herein.

C. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All workmanship shall be of the highest quality; sub-standard work will be rejected.

1.03 GENERAL INFORMATION

A. Each bidder or his authorized representatives shall, before preparing his proposal, visit all areas of the site in which work under this Section is to be performed and inspect carefully the existing conditions. The submission of the proposal by the bidder shall be considered evidence that he or his representative has visited the site and noted the locations and conditions under which the work will be performed and that he takes full responsibility for a complete knowledge of all factors governing his work.

B. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material and all work which may be reasonably implied as being incidental to the work of this Section shall be furnished at no extra cost.

1.04 CODES, INSPECTION AND FEES

A. All material and installation shall be in accordance with the latest edition of the National Electrical Code and all applicable national, local and state codes.

B. All equipment and material shall be U.L. listed.

C. Pay all fees required for permits and inspections.

1.05 TEMPORARY ELECTRICAL FACILITIES

A. The Contractor shall furnish, install, and maintain all materials and equipment required to provide temporary light and power to perform the work of all trades during construction until work is competed. Adequate lighting and receptacle outlets for operation of hand tools shall be provided throughout the project, including trailers, field offices, etc. and shall be extended as construction progresses.

B. All reasonable safety requirements shall be observed to protect workers and the public from shock and fire hazards.

1. Ground fault circuit interrupters shall be employed in accordance with codes.

2. Ground wires are required in all circuits. Ground poles are required on all outlets. All metallic cases shall be grounded.

3. Raintight cabinets shall be used for all equipment in wet locations.

1.06 OWNER COORDINATION

A. The Contractor shall coordinate with the Owner all power interruptions at least 48 hours in advance and obtain permission from the Owner prior to interrupting the power.

1.07 INTERPRETATION OF DRAWINGS

A. The Drawings are not intended to show exact locations of conduit runs.

B. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.

C. Unless otherwise approved by the Engineer conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.

D. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation.

E. All wire, conduit, circuit breaker, and motor starter sizes shown on the drawings are indicative of the sizes required based upon the equipment shown. These may vary depending upon the actual equipment furnished. The Contractor shall make adjustments as required to meet the installation requirements of equipment.

F. The locations of equipment and devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. Obtain in the field all information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.

G. Circuit layouts shown are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting, and other electrical systems shown. Additional circuits shall be installed whenever needed to conform to the specific requirements of the equipment.

H. All floor mounted electrical equipment, including but not limited to motor control centers, transformers, control panels, etc., shall be placed on a four inch (4") concrete housekeeping pad.

I. All connections to equipment shall be made as shown, specified, and directed and in accordance with the approved shop drawings.

J. Provide and place all sleeves for conduits penetrating floors, walls, partitions, etc. Locate all necessary slots for electrical work and form before concrete is poured.

K. All cutting and patching necessary throughout the existing site shall be done in a thoroughly workmanlike manner.

1.08 HANDLING OF EQUIPMENT

A. The equipment shall be kept upright at all times. When equipment has to be tilted for ease of passage through restricted areas during transportation and installation, the Manufacturer shall be required to brace the equipment suitably, to insure that the tilting does not impair the functional integrity of the equipment.

1.09 COMPONENT INTERCONNECTIONS

A. Component equipment furnished under this Specification will not be furnished as integrated systems.

B. Analyze all systems components and their shop drawings; identify all terminals and prepare drawings or wiring tables necessary for component interconnection.

1.10 MATERIALS

A. The materials used in all systems shall be new, unused, of the manufacturer’s latest design, and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or Manufacturer's Specifications shall be submitted for approval as required by the Engineer.

B. Materials and equipment used shall be Underwriters Laboratories, Inc. listed.

C. Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors.

Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the Contractor at his own cost and expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried-out and put through such special tests as directed by the Engineer, at the cost and expense of the Contractor, or shall be replaced by the Contractor at his own expense.

D. All electrical panels, enclosures, raceways, conduits, wireways, boxes, cabinets, etc., shall be fabricated of metal, Non-metallic substitutes are not acceptable. This does not apply to buried work.

1.11 SHOP DRAWINGS

A. Shop drawings shall be submitted for approval of all materials, equipment, apparatus, and other items as required by the Engineer.

B. Shop drawings shall be submitted for all equipment supplied under Division 16 of the specifications.

C. Prior to submittal by the Contractor, all shop drawings shall be checked for conformance with the Contract requirements. Shop drawings shall bear the date checked, checker’s name and indication of approval. Provide an itemized list noting all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.

D. The Engineer's check shall be only for conformance with the design concept of the project and compliance with the Specifications and Drawings.

E. No material shall be ordered or shop work started until the Engineer's approval of shop drawings has been given.

1.12 WARRANTY

A. All equipment furnished and installed, and all work performed under Division 16 shall be guaranteed by the Contractor against defects of workmanship, materials, and proper installation for a minimum period of one (1) year from date of acceptance. This time shall be increased to the periods stated within individual specification sections as required.

1.13 RECORD DRAWINGS

A. As the work progresses, legibly record all field changes on a set of project Contract Drawings. When the project is complete, furnish a complete set of "as-built" drawings for the Project Record Documents.

1.14 TESTS

A. Test all systems in the presence of the Engineer and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.

B. The following test requirements are intended to supplement test and acceptance criteria that may be stated elsewhere in the specifications.

1. Power Instrumentation: Demonstrate that meters are functional. Demonstrate that meters are within catalog accuracy as installed with specific reference to kilowatt readings.

2. Demonstrate mechanical and/or electrical interlocking by attempting to subvert the intended sequence.

3. Activate ground fault tripping by operating test features provided with ground current protective systems and by injecting a known, and reasonable, current in the ground current sensor circuit. In general, ground fault tripping should occur at a ground current equivalent to 20 percent of phase current.

4. Test ground fault circuit interrupting (GFCI) receptacles and circuit breakers for proper operation.

5. A functional test and check of all electrical components is required prior to performing subsystem testing and commissioning. Compartments and equipment shall be cleaned before commencement of functional testing. Functional testing shall include:

    a. Visual and physical check of cables, busswork, circuit breakers, transformers, and connections associated with all new equipment.

    b. Setting of protective relays in conformance with results of the Short Circuit Study and testing of relays to assure that relays will trip at the current value and time required by the Study.

    c. Circuit breakers which are specified with adjustable time or pick-up settings for ground current, instantaneous overcurrent, short-time overcurrent, or long-time overcurrent, shall be field adjusted by a representative of the circuit breaker Manufacturer. Time and pickup settings shall correspond to the recommendations of the Short Circuit Study. Setting shall be tabulated and proven for each circuit breaker in its installed position; test results shall be certified by the testor and transmitted to the engineer.

C. Subsystem testing shall occur after the proper operation of protective relays and alarm and status contacts has been demonstrated or otherwise accepted by the Engineer and after process control devices have been adjusted as accurately as possible. Subsystems, in the context discussed here, shall mean individual and groups of pumps, standby power systems, air conditioning units, ventilation fans, etc.

1. After initial settings have been completed, each subsystem shall be operated in the manual mode and it shall be demonstrated that operation is in compliance with the Contract Documents. Once the manual mode of operation has been proven, automatic operation shall be demonstrated to verify such items as proper start and stop sequence of pumps, proper operation of standby power systems, etc.

2. Motor operated pumps shall be operated only after having been phased and tested for correct motor rotation and current draw by a representative of the pump Manufacturer. Tests shall verify status indication, and correct command control from local and remote devices.

PART 2 - PRODUCTS (not used)

PART 3 – EXECUTION

3.01 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. The Contractor shall provide the services of a qualified Manufacturer's technical representative of the existing motor control center (MCC) who shall adequately supervise the installation, testing of, and startup of the VFD's and all other modifications made to the existing MCC. The services of the Manufacturer's representative shall be provided for the periods stated in the following schedule:

INSTALLATION TRIP (DAYS)	**OPERATION TRIP* (DAYS)**
3	2

* During the operation trip, the Manufacturer's representative shall instruct the Owner's personnel in the proper maintenance and operation of the equipment.

A total of five (5) service days (40 hours) shall be provided by the Manufacturer's representative.

B. Any additional time required to achieve successful installation and operation shall be at the expense of the contractor. The Manufacturer's representative shall sign in and out at the office of the resident project representative on each day of arrival at the project.

END OF SECTION

SECTION 16110

RACEWAYS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish and install complete raceway systems as shown on the Drawings and as specified herein.

1.02 APPLICATIONS

A. Except where otherwise shown on the Drawings, or hereinafter specified, all exposed raceways shall be rigid galvanized steel.

B. PVC coated RGS conduit shall be used as raceways for shielded wiring.

C. Schedule 40 PVC shall be used underground, unless otherwise noted. Transitions to exposed, outdoor locations shall be made using RGS conduit starting with the last 90 degree elbow.

D. Schedule 80 PVC shall be used where exposed below grade, in process rooms, and in corrosive areas.

E. All conduit of a given type shall be the product of one manufacturer.

F. Combination expansion-deflection fittings shall be used where exposed or embedded conduits cross structure expansion joints.

G. Liquidtight flexible metal conduit (between 18" and 36" in length) shall be used for all motor terminations and other equipment where vibration is present. All flexible conduits shall use a bonding wire unless a ground wire is included.

H. Unless otherwise hereinafter specified or shown on the Drawings, all boxes shall be metal.

PART 2 - PRODUCTS

2.01 RIGID CONDUIT

A. Steel conduit shall be hot-dipped galvanized as manufactured by the Youngstown Sheet and Tube Company, Allied Tube and Conduit Corporation, Wheeling-Pittsburgh Steel Corporation, or approved equal.

B. PVC coated rigid steel conduit shall be hot-dipped galvanized inside and out including threads. The PVC coating shall be UL listed for corrosion protection and be at least 40 mil thick. A 2 mil green urethane interior coating shall be provided. PVC coated rigid steel conduit shall be as manufactured by the Perma-Cote Company, Gilmer, Texas or approved equal.

C. PVC conduit shall be rigid polyvinyl chloride type as manufactured by Carlon, an Indian Head Company, Phillips Petroleum Company, Triangle Pipe and Tube Company, Inc., or approved equal.

2.02 LIQUIDTIGHT, FLEXIBLE METAL CONDUIT, COUPLINGS AND FITTINGS

A. Liquidtight, flexible metal conduit shall be Sealtite, Type UA, manufactured by the Anaconda Metal Hose Division, Anaconda American Brass Company, American Flexible Conduit Company, Inc., Universal Metal Hose Company, or approved equal.

B. Fittings used with flexible conduit shall be of the screw-in type as manufactured by the Thomas and Betts Company, Crouse-Hinds Company, or approved equal.

2.03 FLEXIBLE COUPLINGS

A. Flexible couplings shall be as manufactured by the Crouse-Hinds Company, Appleton Electric Company, or approved equal.

2.04 BOXES AND FITTINGS

A. Combination expansion-deflection fittings shall be Type XD as manufactured by the Crouse-Hinds Company or approved equal.

B. Pressed steel switch and outlet boxes shall be hot-dipped galvanized as manufactured by the Raco Manufacturing Company, Adalet Company, O.Z. Manufacturing Company, or approved equal.

C. Terminal boxes, junction boxes, pull boxes, etc., shall be pressed steel unless otherwise shown on the Drawings. Boxes shall be galvanized and have continuously welded seams. Welds shall be ground smooth and galvanized. Box bodies shall be flanged and shall not have holes or knockouts. Box bodies shall not be less than 14 gauge metal and covers shall not be less than 12 gauge metal. Covers shall be gasketed and fastened with stainless steel screws. Boxes shall be as manufactured by Hoffman Engineering Company or approved equal.

D. Cast iron boxes and fittings shall be galvanized with cast galvanized covers and corrosion-proof screws as manufactured by the Crouse-Hinds Company, Appleton Electric Company, or approved equal.

E. Conduit hubs shall be as manufactured by Meyers Electric Products, Inc., Raco Division, Appleton Electric Company, or approved equal.

E. Conduit wall seals shall be Type WSK as manufactured by O.Z. Electrical Manufacturing Company, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. No conduit smaller than ½ inch electrical trade size shall be used, nor shall any have more than four (4) 90 degree bends in any one run. Pull boxes shall be provided as required or directed. Minimum size in floor slabs shall be ¾ inch.

B. An equipment grounding conductor sized per article 250-95 of the N.E.C. shall be installed in every raceway whether or not shown on the Drawings.

C. All underground conduit shall be buried at least 24 inches below grade.

D. A three (3) inch wide warning tape, red with black stenciled letters **"CAUTION - CAUTION - CAUTION ELECTRICAL LINE BURIED BELOW"** shall be installed at least 12 inches above, and along the entire length of all underground conduit.

E. No wire shall be pulled until the conduit system is complete in all details, or in the case of concealed work, until all rough plastering or masonry has been completed.

F. The ends of all conduits shall be tightly plugged to exclude dust and moisture while under construction.

G. Conduit supports shall be spaced at intervals of eight (8) feet or less, as required to obtain rigid construction.

H. Single conduits shall be supported by means of one-hole pipe clamps in combination with one-screw back plates, to raise conduits from the surface.

I. All conduits on exposed work shall be run at right angles to and parallel with the surrounding wall or slab. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduit shall be run perfectly straight and true.

I. Conduit stub outs for future construction shall be provided with threaded PVC end caps at each end.

K. All earth, sod, etc., moved during the installation of underground conduit shall be replaced by the contractor to its original state.

L. Conduits terminating in pressed steel boxes shall have double locknuts and insulated bushings.

M. Conduits terminating in gasketed enclosures shall be terminated with conduit hubs.

N. Conduit wall seals shall be used for all conduits penetrating walls below grade or other location shown on the Drawings.

O. All field cut threads on galvanized steel conduit shall be cleaned and painted with zinc-rich paint before installation.

P. All conduits terminating through concrete shall be hot-dipped galvanized steel and painted with bitumastic from 6 inches below to 6 inches above slab.

Q. All exposed, outdoor PVC conduits and boxes and PVC coated RGS conduits shall be painted with two (2) coats of silver paint.

R. The ends of all conduits terminating in panels, cabinets, and equipment shall be filled with silicone gel. Filling shall be done after the cable has been pulled in order to prevent moisture and insects in the terminating enclosure.

END OF SECTION

SECTION 16120

WIRES AND CABLES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish, install and test all wire, cable, and appurtenances as shown on the Drawings and as hereinafter specified.

1.02 APPLICATIONS

A. Wire for all low voltage power and motor circuits shall be type XHHW, stranded.

B. Single conductor wire for control, indication and metering shall be type XHHW No. 14 AWG, stranded.

A. Wire for process instrumentation shall be shielded pairs No. 16 AWG, stranded with individual drain wires.

1.03 SUBMITTALS

A. Samples of proposed wire and cable shall be submitted for approval. Each sample shall have the size, type of insulation and voltage stencilled on the jacket.

B. Approved samples will be sent to the project location for comparison by the Resident Engineer with the wire actually installed.

C. Installed, unapproved wire shall be removed and replaced at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All wires and cables shall be of annealed, 98 percent conductivity, soft drawn copper conductors.

B. All conductors No. 8 AWG and larger shall be stranded.

C. Type XHHW shall be 600 volt cross-linked polyethylene (XLP) and type THHN/THWN shall be 600 volt as manufactured by the Hi-Tech Company, Rome Cable Corporation, The Okonite Company or approved equal.

D. Process instrumentation wire shall be 600 volt, PVC or polyethylene insulated, aluminum/polyester tape shielded, polyvinyl chloride jacketed, type “TC” as manufactured by the American Insulated Wire Company, Belden Corporation, “Beldfoil” 9342, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All conductors shall be carefully handled to avoid kinks or damage to insulation.

B. Lubrications shall be used to facilitate wire pulling. Lubricants shall be U.L. listed for use with the insulation specified.

C. Shielded instrumentation wire shall be installed from terminal to terminal with no splicing at any intermediate point.

D. Instrumentation cables shall be separated from power and control cables in pullboxes.

E. Shielding on instrumentation wire shall be grounded at the transmitter end only, or as directed by the supplier of the instrumentation equipment.

F. Wire and cable connections to terminals, splices, and taps shall be made with compression connectors. Connections of insulated conductors shall be insulated and covered. All connections shall be made using materials and installation methods in accordance with instructions and recommendations of the manufacturer of the particular item of wire and cable. The conductivity of all completed connections shall be not less than that of the uncut conductor. The insulation resistance of all completed connections of insulated conductors shall be not less than that of the uncut conductor.

G. All wire and cable shall be continuous and without splices between points of connection to equipment terminals, except a splice will be permitted by the Engineer if the length required between the points of connection exceeds the greatest standard shipping length available from the manufacturer specified or approved by the Engineer as the manufacturer of the particular item of wire and cable.

H. Steel fish tapes and/or steel pulling cables shall not be used in PVC conduit runs.

3.02 TESTS

A. All 600 volt wire insulation shall be tested with a megohm meter after installation. Tests shall be made at not less than 1,000 VDC.

END OF SECTION

SECTION 16483

VARIABLE FREQUENCY DRIVES (VFD'S)

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Supplier shall furnish, test, and place in satisfactory operation, complete variable frequency drive systems, with all spare parts, accessories, and appurtenances as specified herein, all in accordance with the requirements of the Contract Documents.

1.02 SUBMITTALS

A. Submit Shop Drawings in accordance with the requirements of the Contract Documents. Shop Drawings shall include the following:

1. Complete variable frequency drives data including dimensions, weights, and detailed performance information, including heat contribution to the environment.

2. Enclosure outline Drawings showing dimensions and weight. These shall include a front panel elevation showing all devices and nameplates.

3. Catalog cut and catalog data for all equipment and devices.

4. Complete wiring diagrams, elementary or control schematics, including coordination with other electrical control devices operating in conjunction with the speed controller and suitable outline. Drawings shall be furnished for review before proceeding with manufacturing. Due to the complexity of the control functions, it is imperative that the above Drawings be clear and carefully prepared to facilitate interconnections with other equipment. Clearly differentiate between portions of wiring which are Manufacturer installed and portions which are field installed. Standard preprinted sheets or Drawings marked to indicate applicability to this contract will not be acceptable.

5. Any exception to this Specification along with detailed justification for each exception. All items shall be in bold letters and underlined.

6. VFD manufacturer's statement accepting two (2) years warranty responsibility.

7. Copies of a preliminary O&M manual.

8. A list of the Manufacturer's recommended special tools and spare parts to be supplied. Spare parts lists, included with the shop Drawing submittal shall indicate specific sizes, quantities, and part numbers of the items to be furnished.

B. Submit copies of all factory test results to the Engineer for review and approval prior to shipment of each VFD. The number of copies of the test reports shall be the same as required for Shop Drawing submittals.

C. Furnish five (5) identical sets of operation and maintenance manuals when the VFD's are delivered for each type of VFD. Each set shall consist of one (1) or more volumes, each of which shall be bound in a standard size, 3-ring, loose-leaf, vinyl plastic hard cover binder, with pockets, suitable for bookshelf storage. Binder ring size shall not exceed 2.5 inches.

1. O&M manuals shall include operating and maintenance instructions as applicable, for each type of VFD as follows:

a. Complete operating instructions, including location of controls, special tools, or other equipment required, related instrumentation, and other equipment needed for operation.

b. Preventative maintenance procedures and schedules.

c. Parts lists, by generic title and identification number, complete with exploded views of each assembly.

d. Disassembly and reassembly instructions.

e. Recommended troubleshooting and start-up procedures.

f. Name and location of nearest supplier/service representative and spare parts warehouse.

1.03 TOOLS, SUPPLIES AND SPARE PARTS

A. Parts shall be completely identified with a numerical system to facilitate parts inventory, control and stocking. Each part shall be properly identified by a separate number, and those parts which are identical for more than one size unit shall have the same number. The following shall be supplied for each size of drive:

1. One (1) set of all special tools, wrenches and non-standard test equipment required to disassemble, test, repair and adjust the equipment shall be provided.

2. One (1) complete set of Manufacturer recommended spare parts. Spare parts shall include, as a minimum, all replaceable circuit boards, fuses, power semiconductors, power transistors, indicator lamps and appurtenances.

Additional items shall be supplied as recommended by the equipment Manufacturer or as described elsewhere in the Specifications.

1.04 WARRANTY

A. All equipment furnished under this Section shall be guaranteed by the Manufacturer against defects of workmanship and materials for a period of two (2) years from date of substantial completion of the project. All such equipment or defective parts shall be replaced by the Manufacturer at no cost to the Owner.

PART 2 - PRODUCTS

2.01 VARIABLE FREQUENCY DRIVES

A. General

1. The Contractor shall provide integrated, all solid state, microprocessor controlled, pulse width modulated, variable frequency drive (VFD) speed control systems for the control of pumping units and motors, and other variable speed motor driven equipment in response to automatic or manual control input signals, in accordance with the Contract Documents.

2. The variable frequency drive (VFD) units shall be integrated, all solid state systems designed to operate at 460 volt A.C., three-phase, 60 Hz**.** in an air conditioned space. The variable speed control systems shall be supplied to control the speed of any standard NEMA Design B squirrel cage induction motor with 1.15 service factor derated to 1.0 and without requiring motor modifications.

3. Provide a separate VFD controller for each motor called out for variable speed control on the Drawings.

4. All drives shall be of first class workmanship and shall be entirely designed and suitable for the intended services. All materials used in fabricating the equipment shall be new and undamaged.

5. The VFD's shall be manufactured in accordance with all applicable NEMA and NFPA 70 requirements.

6. Each complete VFD system shall be U.L. listed in accordance with U.L. Spec 508C.

B. Manufacturers

1. All VFD's supplied under this Section shall be products of a single Manufacturer.

2. VFD systems must not be fabricated in whole or part by parties other than the VFD manufacturer. Package modification to a Manufacturer's standard product will not be allowed by outside parties.

3. Manufacturers shall have a minimum of 10 years experience specializing in the design and manufacturing of PWM variable frequency drives.

4. Manufacturers shall have maintained factory trained and authorized service facilities within 100 miles of the project and have a demonstrated record of service for at least the previous three years. Full-time support personnel shall be employed by the manufacturer.

5. Manufacturers shall be certified to ISO-9001 Series of Quality Standards with drive products manufactured in an ISO certified facility to assure all quality and corrective action procedures have been adhered to.

6. Subject to compliance with all of the requirements, provide variable frequency drives of

one of the following Manufacturers: Eaton, or Square-D. No other Manufacturer's are approved.

C. Operation

1. Accomplish speed control by adjusting both the output voltage and frequency to the motor. Convert input AC power to a constant voltage DC which is then converted to adjustable voltage and frequency three-phase AC utilizing pulse width modulation technology to operate the connected motor at the desired speed. The VFD shall not induce excess power losses in the motor. The VFD shall not produce voltage impulses deemed harmful to the motor insulation by the motor Manufacturer.

2. Each VFD shall be specifically designed for use with variable torque pumping loads. Soft-start control circuitry shall limit in-rush current, not to exceed 100 percent of motor full load current, under all manual and automatic operating conditions. When power outages occurs, the drive system shall shut down in an orderly manner. Upon restoration of A.C. power, the motors shall restart sequentially and run at a rate depending upon the reference requirements, by the sequencing logic controller.

D. Ratings

1. Line Voltage: 460 volts, three-phase, (+/-) 10 percent continuous.

2. Line Frequency: 48-62 Hz.

3. Ambient Temperature: 0 degrees C to 40 degrees C.

4. Altitude: Up to 3300 feet above sea level.

5. Maximum Transient Current Variable Torque: 1.00 continuous, 1.10 one minute; Constant Torque: 1.00 continuous, 1.50 one minute

6. Power Factor: Minimum 0.95 throughout speed and load range. Power factor correction by capacitors shall not be acceptable.

7. Relative Humidity: 95 percent noncondensing.

E. Performance

1. Efficiency: Above 97 percent at 100 percent output frequency (full speed) and full load as well as above 95 percent at all reduced load and speed conditions between 40 and 100 percent output frequency.

2. VFD Inrush Current: Limited to less than 100 percent of motor full load current.

3. Duty Cycle: 6 starts per hour.

4. Output Frequency Range; 6 hertz to 60 hertz, cogless, with adjustable minimum and maximum to match the required operating conditions.

5. Output frequency stability (+/-) 1.0 percent, continuous

6. Pulse Width Modulation (PWM) controller carrier frequency regulation shall be designed for "quiet" motor operation. Induced motor noise when operating at full speed and load on VFD shall not exceed 5 dBA above the measured motor noise level when operating directly on AC power (across the line) at full motor speed and load. Motor noise when operating on VFD shall not exceed full speed measured noise levels when operating at reduced motor load and speed conditions between 40 and 100 percent of output frequency. Noise shall be measured in accordance with IEEE Standard 85. Output noise filters shall be provided where necessary to meet this requirement.

7. Speed regulation $\pm$3 percent without the use of a motor mounted tachometer.

F. Features

1. Provisions for the following control signals for automatic and manual operations.

   a. Start/stop signal from a single remote 24 VDC contact closure (maintained contact).

   b. A linear 4-20 mA, 24 VDC input signal for remote speed (output frequency) control proportional to 20 - 100 percent output speed (frequency). This range (20 - 100 percent) shall be field adjusted for proper control coordination. Input signal isolation shall be provided.

2. Controller keypad to program drive parameters as specified herein.

3. Hand/off/automatic selector switch with auxiliary contacts as required by the Drawings.

4. Potentiometer or equivalent for manual speed (output frequency) control.

5. Drive controller output digital type indicator and transmitter calibrated in percent of maximum output frequency. Transmitter shall provide a linear, isolated, 4-20 mA, 24 VDC output proportional to 0 - 100 percent (initial setting) of maximum output frequency.

6. 120V a.c. control circuitry.

7. Provision for automatic emergency shutdown without rampdown, in any mode, actuated by large, red, illuminated, local emergency pushbutton.

8. One set of DPST auxiliary contacts for each remote indication of status as required by the Drawings.

9. The VFD shall be relatively insensitive to waveform distortion, especially the waveform distortion caused by the VFD.

10. A six pulse converter section consisting of a three-phase, full wave phase controlled rectifier or diode bridge converter to convert incoming A.C. power to constant voltage D.C.

11. D.C. bus capacitors and inductors necessary to filter rectification ripple.

12. Three-phase full wave inverter to construct an A.C. wave form, with minimum harmonic content, at any frequency between 0 and 60 Hz. to control motor speed. Motor terminal voltage shall be controlled in proportion to output frequency such that the voltage to frequency ratio remains essentially constant.

13. Adjustable volts/Hz ratio.

14. Adjustable PWM carrier frequency.

15. Independent acceleration and deceleration controls, adjustable from 0 to 600 seconds.

16. The drive shall accommodate the opening of a disconnect between the drive output and the motor, while under full load.

17. All input/output signals shall be wired to terminal strips for field terminations. Provide an RS232 or RS485 port for remote computer monitoring.

18. Provide panel mounted master reset pushbutton for all safety and overload circuitry.

19. Elapsed motor run-time meter with six digit nonreset indicator operable through auxiliary contacts from the VFD.

20. Provide typewritten terminal block schedules and wiring diagrams within a plastic holder permanently attached to the inside door of the VFD.

21. Adjustable current limit to control the maximum controller output current during starting and running.

22. Minimum and maximum speed adjustment. Minimum speed shall be factory set at 50 percent of motor nameplate rated full load speed. Maximum speed shall be preset to 100 percent of motor nameplate rated speed or as required by existing motor nameplate full load current. The drive shall provide at least three adjustable setpoints to lock out continuous operation at frequencies which may produce mechanical resonance.

23. The VFD shall be capable of starting into a motor rotating at any speed without tripping.

24. Key circuit points shall be monitored by light emitting diodes, (LEDs) to assist in troubleshooting. Each shall be labeled and referenced to the instruction manual.

25. The VFD shall be operable with the output open circuited.

26. The VFD shall be capable of running on electrical power supplied from a high impedance source such as the standby generator. VFD shall be capable of operating with other VFD's on the standby generator without affecting each other.

27. Provide 120 volt power and associated circuitry within the VFD unit to energize the motor space heaters (50 h.p. and above) when the motor is off and de-energize the motor space heaters when the motor is on.

28. Input line reactors shall be provided for all drives 50 horsepower and above. These shall be 5 percent reactors and mounted within the VFD enclosure.

29. Separate motor overload protection shall be provided in the VFD enclosure. This shall consist of a three phase, temperature compensated, adjustable, Class 20 overload device. An overload shall shut down the VFD, without ramping, until manually reset. Provide auxiliary contacts as required.

30. An output line reactor and/or other suitable filter, sized for maximum VFD output, shall be provided on the drive output to the motor. The purpose of this device shall be to attenuate possibly damaging voltage transients and "ringing" effects on the motor feeder cable and motor winding insulation. The reactor/filter shall be designed for mounting within the VFD enclosure if at all possible. Alternatively, the unit shall be NEMA-1 enclosed for mounting near the drive.

G. Protection

1. Input/Output power phase loss.

2. Output single phase ground fault or three-phase short circuit.

3. High speed, current limiting input line fuses, if required.

4. Input undervoltage/overvoltage.

5. Output overcurrent trip protection.

6. The controller shall provide for automatic reset subsequent to loss of line voltage. Adjustable restarting time delay relays shall be provided to prevent simultaneous starts for motors 100h.p. and above.

7. Electronic motor overload.

8. VFD shall automatically shut down if input voltage falls 10 percent below operating voltage for more than 20 cycles, with automatic restart upon return to a stable operating voltage.

9. VFD overtemperature.

10. Power on self test and watchdog fault protection where microprocessor controlled units are provided.

11. Loss of control voltage.

12. DC bus over/undervoltage protection.

H. Construction

1. Enclosure shall be NEMA Type 0, open, for mounting with the existing MCC.

a. Mount the following devices on the front of each VFD/cubicle in the existing MCC:

1. Hand/Off/Automatic motor run selector switch.

2. Manual Speed potentiometer or equivalent.

3. Digital indicator calibrated in percent of maximum output speed (frequency).

4. Master Reset pushbutton.

5. Power On indicating light.

6. Cabinet door handle with mechanical interlock to disconnect switch.

7. Controller Fault indicating light.

8. Controller Keypad.

9. Motor Run indicating light.

10. Motor Overload indicating light.

11. Other Fault indicating lights, when required.

12. Overload Reset pushbutton.

13. Elapsed run-time meter.

14. Emergency Stop pushbutton.

Note: Items 2 & 3 may be integral to the keypad.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING

A. All equipment parts shall be properly protected in accordance with Manufacturer requirements so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation.

B. Factory assembled parts and components shall not be dismantled for shipment unless permission is received in writing from the Engineer.

C. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.

D. Each box or package shall be properly marked to show its net weight in addition to its contents.

3.02 FACTORY TESTS

A. Subject each VFD unit to a complete functional test under actual or simulated motor load conditions to demonstrate operational performance characteristics, drive efficiency, and performance of other features as specified prior to shipment of units. Tests shall be conducted at full rated load and operating temperature.

B. Certified test reports shall be submitted to the Engineer before the equipment is shipped to the project site.

3.03 INSTALLATION AND STARTUP

A. Tighten connectors and terminals, including screws and bolts, in accordance with equipment Manufacturer's published torque tightening values for equipment connectors. Where Manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in U.L. Standards 486A and B, and the National Electrical Code. The VFD cubicle shall not be used as a raceway for wiring unless a dedicated wiring space is provided. Wiring shall not run through or between components not served.

B. Prior to energization of VFD equipment, check with ground resistance tester, feeder and motor winding phase-to-phase, and phase-to-ground insulation resistance levels to ensure requirements are fulfilled. Check circuitry for electrical continuity, and for short-circuits, and ensure that direction of rotation of each motor fulfills requirements. It is extremely important that the motor be completely isolated/disconnected from the drive prior to meggering the motor.

C. Provide equipment grounding connections for VFD equipment as indicated. Tighten connections to comply with tightening torques specified in U.L. Standard 486A to assure permanent and effective grounding.

D. Upon completion of installation of VFD equipment and electrical circuitry, energize VFD circuitry and demonstrate functioning of equipment in accordance with requirements. Where possible, correct malfunctioning units at the site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and retest to demonstrate compliance.

3.04 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. The Supplier shall provide the services of a qualified Manufacturer's technical representative who shall adequately supervise the installation, testing of, and start up of all equipment furnished under this Section, and instruct the Contractor's personnel and the Owner's operating personnel in its maintenance and operation. The services of the Manufacturer's representative shall be provided for the periods stated in the following schedule:

INSTALLATION TRIP (DAYS)	OPERATION TRIP* (DAYS)	GUARANTEE PERIOD TRIP (DAYS)
1	1	1

* During the operation trip, the Manufacturer shall instruct the Owner's personnel

A total of three (3) service days (24 hours) shall be provided by the Manufacturer's representative.

B. The Manufacturer's representative shall direct all final adjustments necessary for the drive system to meet all operational and performance requirements outlined herein.

C. Any additional time required to achieve successful installation and operation shall be at the expense of the Contractor. The Manufacturer's representative shall sign in and out at the office of the resident project representative on each day of arrival at the project.

- END OF SECTION -

SECTION 16490

ELECTRIC MOTORS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish and install electric motors, accessories, and appurtenances as specified herein and in conformance with the individual Specifications of driven equipment, to provide a complete and operable installation, all in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Electrical, General Provisions.

B. Equipment Specifications as applicable.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Manufacture, testing and installation shall be in accordance with the following:

ANSI/NEMA MG 1	Motors and Generators.
ANSI/IEEE 112	Test Procedure for Polyphase Induction Motors and Generators.
NFPA 70	National Electrical Code

1.04 SUBMITTALS

A. Complete motor data shall be submitted with the driven machinery shop Drawings. Motor data shall include:

1. Machine name and Specification number of driven machine.

2. Motor manufacturer.

3. Motor type or model and dimension Drawing.

4. Nominal horsepower.

5. NEMA design.

6. Frame size.

7. Enclosure, type and dimensions.

8. Winding insulation class and treatment.

9. Rated ambient temperature.

10. Service factor.

11. Voltage, phase, and frequency rating.

12. Full load current at rated horsepower for application voltage.

13. Starting code letter, or locked rotor KVA, or current.

14. Special winding configuration such as part-winding, star-delta.

15. Rated full load speed.

16. Power Factor at full load, 75 percent, and 50 percent load.

17. Motor efficiency, nominal and guaranteed values.

18. Motor torque speed curves from zero to full load speed.

19. Test results.

1.05 FACTORY TESTING

A. Each motor shall be shop tested to determine compliance with requirements of the IEEE, ANSI and NEMA. Tests shall be as follows:

B. Motors less than 50 horsepower: Each motor shall be subjected to a standard short commercial test including the following:

1. Running light current

2. Locked rotor current

3. High potential

4. Winding resistance

5. Bearing inspection

C. Motors between 50 and 100 h.p.: Each motor shall be subjected to the above tests and shall be furnished with certified test results.

D. Efficiency: Motors rated 25 through 100 h.p. shall be individually tested for efficiency.

E. Motors larger than 100 horsepower: Each motor shall be furnished with certified test results. Each motor shall be subjected to a complete test consisting of full load heat run, percent slip, running light current, locked rotor current, breakdown torque (calculated), starting torque, winding resistance, high potential, efficiencies at 100, 75 and 50 percent of full load, power factors at 100, 75 and 50 percent of full load, and bearing inspection. The Engineer reserves the right to witness these tests.

F. Test Reports: Copies of all test results shall be submitted to the Engineer for review. The number of copies of the tests shall be the same as the number of Shop Drawings to be submitted as specified in the Contract Documents. Single copies of witnessed raw test data shall be submitted to the Engineer immediately upon completion of such tests. No motor shall be shipped prior to the Engineer's approval of factory tests.

1.06 TOOLS AND SPARE PARTS

A. Furnish spare parts for each motor or group of motors in the same ratio as specified for the driven equipment. As a minimum, furnish the following for motors 50 h.p. and above:

1. One (1) spare set of upper and lower ball bearings, including retainers and seals, for each motor size installed.

2. One (1) spare motor shaft key or equivalent for each motor size installed.

3. One (1) spare terminal box gasket for each motor.

4. One (1) spare fill and drain plug and grease nipple for each motor size installed.

5. One (1) complete set of any additional Manufacturer's recommended spare parts.

B. Spare parts shall be plainly tagged and marked for identification and re-ordering.

C. Furnish all special tools necessary to disassemble, service, repair and adjust the equipment.

1.07 WARRANTY

A. All equipment furnished under this Section shall be guaranteed by the Manufacturer against defects of workmanship and materials for a period of one (1) year from date of acceptance. All such equipment or defective parts, shall be replaced by the Manufacturer at no cost to the Owner.

B. Motors supplied for Variable Frequency Drive (VFD) applications shall be guaranteed as stated above, and further warranted for use under VFD operation by the motor manufacturer.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Electric motors driving identical machines shall be identical.

B. The nominal motor horsepower shall be adequate for the driven machine without infringement upon the motor service factor. Motors driving pumps shall not be overloaded at any head or discharge condition of the pump.

C. The motor horsepower shall not be less than the estimated minimum specified for each driven machine. If the estimated minimum horsepower specified is not adequate to satisfy the foregoing restriction or any other requirements of these Specifications, the motor with the next larger horsepower shall be supplied at no additional cost to the Owner. In addition, any changes caused by increase in motor horsepower shall be made by the Contractor at no additional cost to the Owner; such changes may involve circuit breakers, magnetic starters, motor feeder conductors and conduit sizes, etc.

D. Motors which are for valve operators, submersible pumps, or motors which are an integral part of Standard Manufactured Equipment, i.e., non-NEMA mounting, common shaft with driven element, part of domestic or commercial use apparatus may be excepted from these Specifications to the extent that such variation reflects a necessary condition of motor service or a requirement of the specified driven equipment.

2.02 CONSTRUCTION

A. All electric motors shall comply with ANSI/NEMA MG 1.

B. Electric motors shall be NEMA Design B, (except as noted in equipment Specifications for motors controlled for variable speed operation and other special motors,) constant speed squirrel-cage induction motors having normal starting torque with low starting current. In no case shall starting torque or breakdown torque be less than the value specified in said ANSI/NEMA MG 1. Motors shall be suitable for starting as indicated on the Drawings. Refer to Drawings for type of starting requirements.

C. Motors shall be rated in accordance with the following, unless otherwise specified:

1. Motors below ½ h.p. shall be rated 115 volts, single phase, 60 Hertz. Dual voltage motors rated 115/230 volts, 115/208 volts, or 120-240 volts are acceptable.

2. Motors ½ h.p. and larger shall be rated 230/460 volts, three-phase, 60 hertz, as required and as shown. Dual voltage motors rated 208/230/460 volts are acceptable.

D. Unless otherwise specified, service factor shall be a minimum of 1.15.

E. Motor speed shall be as specified with the equipment.

F. All motors for driven equipment shall be heavy duty unless otherwise specified. Heavy duty motors shall be furnished with Class F tropicalized insulation system and shall be limited to Class B temperature rise, unless otherwise listed in these Specifications. The motor shall be rated to operate at a maximum ambient temperature of 40 degrees C and at the altitudes where the motors will be installed and operated, without exceeding temperature rise limits stated in ANSI/NEMA MG 1-12.42.

G. All motors 50 h.p. or smaller which will be installed outdoors shall be totally enclosed fan cooled (TEFC). All motors larger than 50 h.p. and up to 300 h.p. which will be installed outdoors shall be Weather-Protected Type I. All motors larger than 50 h.p. shall have a minimum 2 cycles of solid, baked epoxy vacuum impregnation. In addition, these motors shall be provided with rodent screens. Enclosures shall have stainless steel vent screens. Provide a 200 watt, minimum space heater for the windings.

H. Unless otherwise specified, all motors which will be installed indoors shall be totally enclosed, fan cooled (TEFC). All motors larger than 50 h.p. located in damp environments such as in pump and pipe galleries, tunnels, chemical feed and sludge areas, shall have 2 cycles of solid baked epoxy vacuum impregnation.

I. Motors with a nameplate rating of 5 h.p. and above shall be "high efficiency" units. Such motors shall have efficiencies determined by the test as set forth in ANSI/IEEE 112, Method B.

J. Efficiency index, nominal efficiency, and minimum efficiency shall be defined in accordance with ANSI/NEMA MG 1-12.53.b; these values shall be stated in the Shop Drawing submittal. Motor nameplate data shall include the nominal efficiency value.

K. Motors in the range of 1 h.p. to 150 h.p., inclusive, shall be designed specifically for energy efficiency and high power factor. In accordance with NEMA Standard MG 1-12.53b, each motor shall meet the minimum guaranteed efficiency for the specified nameplate efficiency. All motor efficiency tests shall be performed utilizing the NEMA preferred test method IEEE 112 method B, Dynamometer. All tests shall be performed in accordance with the procedures contained in NEMA Standard MG 1-12.53.

L. Motors larger than 150 h.p. shall have a minimum efficiency, at full load, of 95 percent and a minimum power factor of 85 percent.

M. Condition of Service: All motors shall meet the following conditions of service, and other conditions as required on the Drawings:

1. Continuous duty.

2. Altitude (below 3300) feet.

3. Ambient temperatures (0) to (40) degrees C.

4. Voltage variation plus or minus 10 percent (unless VFD controlled).

5. Frequency variation plus or minus 5 percent (unless VFD controlled).

6. Combined voltage and frequency variation plus or minus 10 percent. Frequency variation not to exceed plus or minus 5 percent (unless VFD controlled).

7. Across-the-line starting.

8. VFD Control, as required.

N. Rated torque shall be at least 20 percent greater than the maximum full load torque requirements of the driven equipment throughout the full operating range of the driven equipment from start to full load.

O. Stator: The stator shall be assembled from high grade electrical sheet steel laminations adequately secured together. The stator windings shall consist of materials such as polyester film, synthetic varnish or glass cloth. Windings shall be random or form wound, adequately insulated and securely braced to resist failure due to electrical stress and vibrations. Any junction in motor insulation, such as coil connections or between slot and end winding sections, shall have protection equivalent to that of the slot sections of coils. The entire winding of all motors when finished, shall be epoxy encapsulated, after subjecting to a process which removes all moisture and insures freedom of air pockets. Provide winding tropical/fungus protection.

P. Rotor: The shaft shall be made of high grade machine steel or steel forging of size and design adequate to withstand the load stresses. The rotor shall be fabricated of high grade electrical sheet steel laminations adequately fastened together and to the shaft. Squirrel cage windings may be cast aluminum or copper alloy bar-type construction with brazed end rings. Provide winding tropical/fungus protection.

Q. Bearings: Bearings shall be ball or roller antifriction type. Motors up to 300 h.p. shall be grease lubricated. Unless specified otherwise, the bearings shall have a B-10 life as follows:

Motor h.p.	B-10 Life (Hrs)
Less than 50	24,000
50 to 200	40,000
Greater than 200	100,000

1. For vertical motors, thrust bearings shall be Kingsbury Type, ball or roller bearings as required for the design thrust load. Guide bearings shall be radial type ball bearing.

2. Fractional horsepower through 2 h.p. motors shall be furnished with Lubricated-for-Life ball bearings.

3. Motors larger than 2 h.p. shall be furnished with relubricatable ball bearings except vertical pump motors.

4. Vertical pump motors larger than 2 h.p. shall be furnished with relubricatable ball, spherical, roller, or plate type thrust bearings. Lubrication shall be per manufacturer's recommendation for smooth operation and long life of the bearings.

5. Water cooling shall not be required for the thrust bearings.

R. Connections:

1. Leads shall be suitably marked and identified. Terminal housing locations, which are not shown on the Contract Drawings, shall be NEMA Assembly F-1.

2. The low-voltage terminal box shall provide a terminal strip for the space heater. All necessary external wiring between the low voltage terminal box and connections to the motor shall be factory installed.

3. Each motor shall have adequate means for attaching a #4/0 (100 h.p. and above) AWG, or a #1/0 (below 100 h.p.) AWG copper grounding conductor to the motor frame near the base. It shall be a mechanical clamp terminal connector located on the same side as the stator lead junction box.

4. Motors shall be designed and manufactured for operation in a direction as required for driven equipment. The phase sequence at the specified rotation, shall be marked permanently and plainly inside the stator lead junction box.

S. Motors shall be free of objectionable noise and vibration. Motor sound pressure level shall not exceed 85 dbA at five (5) feet under free field, no load conditions in accordance with IEEE Standard 85. All motors shall have a maximum equivalent A-weighted sound level of 80 db A as determined in accordance with IEEE Standard No. 85 under full load and full speed conditions. Vibration level measured on the bearing housing shall be in accordance with values shown in NEMA Standards.

T. All motors shall have breather and drain plugs to allow proper drainage of moisture from inside.

U. VFD Operated Motors: Motors for use with variable frequency drives shall be manufactured, tested, and installed as outlined herein. In addition, the following special requirements shall apply:

1. Motors controlled by adjustable frequency drives shall be specifically designed for inverter operation.

2. Insulation shall be sufficient to protect against the adverse effects of non-sinusoidal waveforms. All insulation material shall be non-hygroscopic.

3. Motor service factor shall be 1.15 derated to 1.0 for non-sinusoidal voltage waveforms.

4. Nameplate information shall include both sinusoidal and non-sinusoidal data. The non-sinusoidal data shall include hertz vs. torque rating, hertz vs. horsepower rating, maximum full load amperes and speed ranges.

5. It is extremely important that the motor be completely isolated/disconnected from the drive prior to meggering the motor.

2.03 ACCESSORY REQUIREMENTS

A. Horizontal motors 3 h.p. and larger, and all vertical motors, shall have split-type cast metal conduit boxes. Conduit boxes for other than open drip-proof motors shall be gasketed.

B. All motors weighing 265 pounds (120 Kg) or more shall have suitable lifting devices for installation and removal.

C. All motors shall be fitted with a permanent, non-corrosive nameplate indelibly stamped or engraved with NEMA Standard motor data, including bearing description and lubrication instructions. Insulation class, ambient temperature, altitude rating, and power factor at full load, if applicable, shall be included.

2.04 MANUFACTURER

A. The driven equipment Supplier shall have responsibility to select and supply suitable electric motors for the equipment. The choice of motor manufacturer shall be subject to review by the Engineer. Such review will consider future availability of replacement parts and compatibility with other equipment.

B. Suppliers, or equal:

1. General Electric

2. Siemens-Allis

3. U.S. Motors

PART 3 - EXECUTION

3.01 INSTALLATION

A. Motor installation shall be performed in accordance with the motor manufacturer's written recommendations and the written requirements of the manufacturer of the driven equipment. Field installation of the unit shall include final alignment.

B. Installation shall also include furnishing necessary oil and grease for initial operation and making final adjustments to place the equipment in operable condition.

C. Electrical work involving connections, controls, switches, disconnects, and etc. shall be performed as provided in the applicable Sections of Division 16.

3.02 FIELD TESTS

A. The Contractor shall megger each motor winding before energizing the motor, and, if insulation resistance is found to be low, shall notify the Engineer and shall not energize the motor. Satisfactory readings shall be as stated by the motor manufacturer.

B. The Contractor shall check all motors for correct clearances and alignment and for correct lubrication, and shall lubricate if required in accordance with Manufacturer's instructions. The Contractor shall check direction of rotation of all motors and reverse connections if necessary.

3.03 PAINTING

A. The motors shall have a chemical resistant protective coating for corrosion and fungus protection on all interior surfaces.

B. Motors shall be shipped to the site with shop primed compatible with the field applied exterior finish coating. After installation and before being placed in final operation, the motors shall be painted in accordance with the "Painting" Section of the Specifications.

END OF SECTION

SECTION 16950

MISCELLANEOUS EQUIPMENT

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish and install all miscellaneous equipment as hereinafter specified and as shown on the Drawings.

PART 2 - PRODUCTS

2.01 PRESSURE INDICATING TRANSMITTER

A. Type:

1. Microprocessor based intelligent type, diaphragm actuated.

2. The instrument shall measure gauge pressure.

B. Functional/Performance:

1. Accuracy-Plus or minus 0.1 percent of calibrated span.

2. Overrange Protection-Provide positive overrange protection to maximum process pressure.

3. RFI Protection-0.1 percent error between 27 and 500 MHz at 20 v/m field intensity.

4. Output-4-20 mA.

5. Power Requirements-120V or Loop powered, two wire type.

6. Stability-Combined temperature effects shall be less than plus or minus 0.25 percent of maximum span per 50 degrees F temperature change.

C. Physical:

1. Electrical Classification-Intrinsically safe or explosion proof for class I and II, Division 1 locations.

2. Enclosure-Rated NEMA 4X.

3. Diaphragm Sensor Material-Cobalt-Nickel-Chrome alloy, 316 stainless steel or Hastelloy C.

4. Sensor Fill Fluid-Shall be suitable for process fluid being measured.

D. Options/Accessories Required:

1. Provide a shutoff valve and mounting bracket for each transmitter.

2. Provide an integral indicator scaled in engineering units.

E. Manufacturers:

1. Rosemount Model 3051TG2A2B21AM5, no substitute.

PART 3 - EXECUTION

3.01 GENERAL

A. All mounting hardware shall be stainless steel.

B. All piping to and from pressure transmitters shall be provided with necessary unions, test tees, couplings, adaptors, and shut-off valves.

C. Instrumentation and accessory equipment shall be installed in accordance with the Manufacturer's instructions. The locations of equipment, transmitters, and devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. Obtain in the field all information relevant to the placing of instruments and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.

D. Unless specifically shown in the contract Drawings, direct reading or electrical transmitting instrumentation shall not be mounted on process piping. Instrumentation shall be mounted on stainless steel unistrut supports. All instrumentation connections shall be provided with shutoff and drain valves. Diaphragm seals with flushing connections shall be provided.

E. The shield on each process instrumentation cable shall be continuous from source to destination and be grounded as directed by the Manufacturer of the instrumentation equipment but in no case shall more than one ground point be employed for each shield.

F. The instrument supplier shall complete the installation, the placing and location of system components, their connections to the process equipment panels, cabinets, and devices, subject to the Engineer's approval. He shall be responsible to insure that all field wiring for power and signal circuits are correctly done in accordance with best industry practice and provide for all necessary system grounding to insure a satisfactory functioning installation.

G. Instrumentation shall be energized and started only by the instrumentation supplier's field representative.

H. All instrumentation shall be carefully checked by the supplier's field service personnel for damage and shall be fully calibrated and put into operation. Field service personnel shall check calibration under actual conditions as equipment is put into service, and shall work closely with the Contractor and Owner/Engineer in obtaining desired control.

-END OF SECTION-

APPENDIX A

PALM BEACH COUNTY
HEALTH DEPARTMENT PERMIT

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

In the matter of an Application for Permit by:

Monica Shaner, P.E.
Assistant Water Utilities Director
City of Lake Worth
301 College Street
Lake Worth, FL 33460
mshaner@lakeworth.org

DEP FILE: 138272-199-WC
County: Palm Beach
Project: Water Treatment Plant High Service Pump Replacement

NOTICE OF PERMIT ISSUANCE

Enclosed is Permit Number **138272-199-WC** to make a minor modification to a community water system to replace two (2) existing high service pumps and add a softening system for the water feed to the ammonia feed system, issued pursuant to Section(s) 403.087, Florida Statutes.

This permit is final and effective on the date filed with the clerk of the Florida Department of Health Palm Beach County (the Department) unless a petition is filed in accordance with the paragraphs below or unless a request for extension of time in which to file a petition is filed within the required time frame and conforms to Rule 62-110.106(4), F.A.C. Upon timely filing of a petition or a request for an extension, this permit will not be effective until further Order of the Department.

A person whose substantial interests are affected by this permit may petition for an administrative proceeding (hearing) in accordance with sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) with the Agency Clerk, Florida Department of Health Palm Beach County , Division of Environmental Public Health, 800 Clematis Street, West Palm Beach, Florida 33401, within 14 days of receipt of this Notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under sections 120.569 and 120.57 of the Florida Statutes. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-106.205, F.A.C.

A petition must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;
(b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;
(c) A statement of how and when the petitioner received notice of the agency decision;
(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
(e) A concise statement of the ultimate facts alleged, including the specific facts which petitioner contends warrant reversal or modification of the Department's action;
(f) A statement of the specific rules or statutes the petitioner contends requires reversal or modification of the Department's action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
(g) A statement of the relief sought by petitioner, stating precisely the action that the petitioner wants the Department to take.

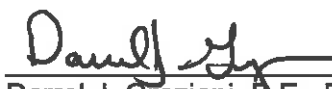
A petition that does not dispute the materials facts on which the Department's action is based shall state that no such facts are in dispute and otherwise contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any such final decision of the Department on the petition have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to section 120.68 of the Florida Statutes, by filing a Notice of Appeal pursuant to Rule 9.110 of the Florida Rules of Appellate Procedure, with the Clerk of the Department, Florida Department of Health Palm Beach County, Division of Environmental Public Health, 800 Clematis Street, West Palm Beach, Florida 33401; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days from the date when the final order is filed with the Clerk of the Department.

Executed in the City of West Palm Beach, Florida.

STATE OF FLORIDA DEPARTMENT OF HEALTH
PALM BEACH COUNTY



Darrel J. Graziani, P.E., R.S.,
Environmental Administrator
Division of Environmental Public Health
800 Clematis Street, West Palm Beach, FL 33401
(561) 837-5900

Enclosures: Permit File No.138272-199-WC

CERTIFICATION OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Permit Issuance and all copies were mailed/electronically transmitted before the close of business on December 28, 2015 to those persons listed.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT

Filed, on this date, under section 120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk

12-28-15
Date

Copies Furnished to:

Engineer-of-Record: John R. Leemon, P.E.
Florida DEP: Jason Andreotta, P.G.

ELECTRONIC CORRESPONDENCE

PERMITTEE:
Monica Shaner, P.E
Assistant Water Utilities Director
City of Lake Worth
301 College Street
Lake Worth, FL 33460
mshaner@lakeworth.org

PWS ID NUMBER: 4500773
PERMIT NUMBER: 138272-199-WC
DATE OF ISSUE: 12/21/2015
EXPIRATION DATE: 12/20/2020
COUNTY: Palm Beach
PROJECT: Water Treatment Plant High Service Pump Replacement

This permit is issued under the provisions of Chapter(s) 403, Florida Statutes, and Florida Administrative Code Rule(s) 62-550, 62-555 & 62-560. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Construct:

- Replacement of two (2) 125 HP, 2,500 GPM high service pumps with two (2), 150 HP, 2,500 GPM @ 73 psi high service pumps.
- A softening system for the feed water to the ammonia feed system consisting of the following:
  - Two (2) multistage, 304 SS, booster pumps, 1HP, with a minimum capacity of 12 GPM at 80 psig
  - One (1) 75 gallon brine tank.
  - One (1) 110 gallon fiberglass hydro-pneumatic tank wit air bladder
  - Associated piping and controls

These modifications will not change the current rated capacity of 17.4 MGD

In Accordance With: Application Form DEP 62-555.900(1), and the Preliminary Design Report and engineering drawing sheets C0-1, C0-2, C1-1 through C1-4 received December 2, 2015.

Located: At the existing Lake Worth Water Treatment Plant on College Street, in the City of Lake Worth, Florida.

To Serve: Existing and future connections.

Subject To: General Conditions 1 – 15, Regulatory Conditions 1- 9, Construction Standards 1-7 and Specific Conditions 1 – 11.

A. General Conditions

The permittee shall be aware of and operate under the Permit Conditions below. These applicable conditions are binding upon the permittee and enforceable pursuant to Chapter 403, Florida Statutes. [F.A.C. Rule 62-555.533(1)]

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in this permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times (reasonable time may depend on the nature of the concern being investigated), access to the premises where the permitted activity is located or conducted to:

    a. Have access to and copy any records that must be kept under conditions of the permit;
    b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

    c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

    a. A description of and cause of noncompliance; and
    b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard.

11. This permit is transferable only upon Department approval in accordance with Rule 62- 4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

    a. Determination of Best Available Control Technology (BACT)
    b. Determination of Prevention of Significant Deterioration (PSD)
    c. Certification of compliance with State Water Quality Standards (Section 401, PL 92-500)
    d. Compliance with New Source Performance Standards

14. The permittee shall comply with the following:

    a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

    b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:
   i. the date, exact place, and time of sampling or measurements;
   ii. the person responsible for performing the sampling or measurements;
   iii. the dates analyses were performed;
   iv. the person responsible for performing the analyses;
   v. the analytical techniques or methods used;
   vi. the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

B. Regulatory Section

1. All construction must be in accordance with this permit. Before commencing work on project changes for which a construction permit modification is required per 62-555.536(1), the permittee shall submit to the Department a written request for a permit modification. Each such request shall be accompanied by one copy of a revised construction permit application, the proper processing fee and one copy of either a revised preliminary design report or revised drawings, specifications and design data. [F.A.C. Rule 62-555.536].

2. Permitted construction or alteration of public water supply systems must be supervised during construction by a professional engineer registered in the State of Florida if the project was designed under the responsible charge of a professional engineer licensed in the State of Florida. The permittee must retain the service of a professional engineer registered in the State of Florida to observe that construction of the project is in accordance with the engineering plans and specifications as submitted in support of the application for this permit. [F.A.C. Rule 62-555.520(3)].

3. If prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoe remains, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, the permitted project should cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries. The permittee, or other designee, should contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section at 850.245.6333 or 800.847.7278, as well as the appropriate permitting agency office. Project activities should not resume without verbal and/or written authorization from the Division of Historical Resources and the permitting agency. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, *Florida Statutes*.

4. If delays will cause project completion to extend beyond the expiration date of this permit, the permittee shall submit to the Department a request to extend the expiration date of this permit including the appropriate processing fee. This request shall specify the reasons for the delay and shall be submitted to the Department for approval prior to the expiration date of this permit. Note that no specific construction permit shall be extended so as to remain in effect longer than five years. [F.A.C. Rule 62-555.536(4)].

5. In accordance with General Condition #11 of this permit, this permit is transferable only upon Department approval. Persons proposing to transfer this permit must apply jointly for a transfer of the permit within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service by the Department using form, 62-555.900(8), Application for Transfer of a PWS Construction Permit along with the appropriate fee. [F.A.C. Rule 62-555.536(5)]

6. This permit satisfies Drinking Water permitting requirements only and does not authorize construction or operation of this facility prior to obtaining all other necessary permits from other program areas within the Department, or required permits from other state, federal, or local agencies.

7. This permit is for CONSTRUCTION ONLY of the distribution system project. This permit shall not infer that the clearance necessary for connection will be granted. Any such clearance shall be granted only when the connection point has been permitted and cleared for use by the Department and the public water system to which the water main extension will be connected, has the capacity necessary to meet the design water demands of all customers to be served by the water main extension. Partial clearance may be granted, if required.

8. If gasoline contamination is found at the construction site, work shall be stopped and the proper authorities notified. With the approval of the Department, ductile iron pipe and fittings, and solvent resistant gaskets materials shall be used in the contaminated area. The ductile pipe shall be used in the contaminated area. The ductile iron pipe shall extend 100 feet beyond any solvent noted. Any contaminated soil that is excavated shall be placed on an impermeable mat, covered with waterproof covering, and held for disposal. <u>If the site cannot be properly cleaned, then consultation with the Department is necessary prior to continuing with the project construction.</u>

9. This permit does not constitute approval of construction on jurisdictional wetland areas; therefore such approval must be obtained separately from the Water Management District or from DEP ERP Section, as applicable, Permittee shall provide a copy of the permit approval to the Department if water main installation involves activities on wetlands.

C. Construction Standards

1. All products, including paints, which shall come into contact with potable water, either directly or indirectly, shall conform with National Sanitation Foundation (NSF) International, Water Chemicals Codex, Food Chemicals Codex, American Water Works Association (AWWA) Standards and the Food and Drug Administration, as provided in Rule 62-555.320(3), F.A.C.

2. Water supply facilities, including mains, pipe, fittings, valves, fire hydrants and other materials shall be installed in accordance with the latest applicable AWWA Standards and Department rules and regulations.

3. The installation or repairs of any public water system, or any plumbing in residential or nonresidential facilities providing water for human consumption, which is connected to a public water system shall be lead free in accordance with Rule 62-555.322, F.A.C.

4. When any existing asbestos cement (AC) pipes are replaced under this permit, the permittee shall do so in accordance with the applicable rules of Federal Asbestos Regulation and Florida DEP requirements. **For specific requirements applicable to AC pipes, the permittee should contact the Air and Waste Management section at DOH Palm Beach County prior to commencing any such activities at (561) 837-5900 #3. Please be aware**

that a notification is required to be submitted to the Department for a regulated project

5. Permittee shall maintain vertical clearance and horizontal separation between water mains and sanitary sewers, storm sewers, etc. unless approved otherwise by the Department, as provided in Rule 62-555.314, F.A.C., and Section 8.6 of *Recommended Standards for Water Works*, a manual adopted by reference in Rule 62-555.330(3), F.A.C.

6. The new or altered aboveground piping at the drinking water treatment plant shall be color coded and labeled as recommended in Section 2.14 of "Recommended Standards for Water Works, 1997 Edition". [F.A.C. Rule 62-555.320(10)]

7. Permittee shall ensure that there shall be no cross-connection with any non-potable water source in accordance with Rule 62-555.360, F.A.C.

D. Specific Conditions

1. All construction must be in accordance with this permit. Before commencing work on project changes for which a construction permit modification is required per 62-555.536(1), the permittee shall submit to the Department a written request for a permit modification. Each such request shall be accompanied by one copy of a revised construction permit application, the proper processing fee and one copy of either a revised preliminary design report or revised drawings, specifications and design data. [F.A.C. Rule 62-555.536].

2. Permitted construction or alteration of public water supply systems must be supervised during construction by a professional engineer registered in the State of Florida if the project was designed under the responsible charge of a professional engineer licensed in the State of Florida. The permittee must retain the service of a professional engineer registered in the State of Florida to observe that construction of the project is in accordance with the engineering plans and specifications as submitted in support of the application for this permit. [F.A.C. Rule 62-555.520(3)].

3. This permit satisfies Drinking Water permitting requirements only and does not authorize construction or operation of this facility prior to obtaining all other necessary permits from other program areas within the Department, or required permits from other state, federal, or local agencies.

4. All products, including paints, which shall come into contact with potable water, either directly or indirectly, shall conform with National Sanitation Foundation (NSF) International, Water Chemicals Codex, Food Chemicals Codex, American Water Works Association (AWWA) Standards and the Food and Drug Administration, as provided in Rule 62-555.320(3), F.A.C.

5. Water supply facilities, including mains, pipe, fittings, valves, fire hydrants and other materials shall be installed in accordance with the latest applicable AWWA Standards and Department rules and regulations. The system shall be pressure and leak tested in accordance with AWWA Standard C600 C603, or C605, as applicable, and disinfected in accordance with AWWA Standard C651-653, as well as in accordance with Rule 62-555.340, F.A.C.

6. Permittee shall maintain vertical clearance and horizontal separation between water mains and sanitary sewers, storm sewers, etc. unless approved otherwise by the Department, as provided in Rule 62-555.314, F.A.C., and Section 8.6 of *Recommended Standards for Water Works*, a manual adopted by reference in Rule 62-555.330(3), F.A.C.

7. The new or altered aboveground piping at the drinking water treatment plant shall be color coded and labeled as recommended in Section 2.14 of "Recommended Standards for Water Works, 1997 Edition". [F.A.C. Rule 62-555.320(10)]

8. The permittee must instruct the engineer of record to request system clearance from the Department within sixty (60) days of completion of construction, testing and disinfecting the system. Bacteriological test results shall be considered unacceptable if the test were completed more than 60 days before the Department received the results. [F.A.C. Rule 62-555.340(2)(c)]

9. Permitted construction or alteration of a public water system may not be placed into service until a letter of clearance has been issued by this Department. [F.A.C. Rule 62-555.345]

10. Prior to placing this project into service, Permittee shall submit, at a minimum, all of the following to the Department for evaluation and approval for operation, as provided in Rules 62-555.340 and 62-555.345, F.A.C.:

    a. the engineer's *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components Into Operation* {DEP Form 62-555.900(9)};

    b. certified record drawings, if there are any changes noted for the permitted project.

    c. two consecutive days of satisfactory bacteriological analytical results (see paragraph 11 below).

    d. copy of a satisfactory pressure test of the process piping performed in accordance with AWWA Standards. [F.A.C. Rule 62-555.320(21)(a)(1)]

11. Bacteriological Testing

The new facilities shall be cleaned, disinfected, and bacteriologically cleared in accordance with Chapter 62-555, F.A.C. The bacteriological clearance data representative of the distribution system (in accordance with the instructions for Bacteriological Sampling Locations shown below) shall be submitted to the Department with the engineer's certification of construction completion. Sampling shall be performed by an employee of a State certified laboratory or a certified operator per PBC ECR-II). [Section 62-555.340 and 62-555.315(6)(b), F.A.C.]

Bacteriological Sampling Locations: Copies of satisfactory bacteriological analyses taken from locations within the distribution system or water main extension to be cleared, in accordance with Rules 62-555.315 (6), 62-555.340 and 62-555.330, F.A.C. and American Water Works Association (AWWA) Standard C 651-92 as follows:

- *The endpoint of the proposed addition;*
- *Any water lines branching off a main extension;*
- *Every 1,200 feet of water main;*
- *Each location shall be sampled on two separate days (at least 6 hours apart) with sample point locations and chlorine residual readings* ***clearly indicated*** *on the report and/or drawings.*
- *Bacteriological sample results will be considered unacceptable if the tests were completed more than 60 days before the Department receives the results.*

Issued This 22nd Day of December, 2015.

STATE OF FLORIDA DEPARTMENT OF HEALTH
PALM BEACH COUNTY

Alina M. Alonso, MD, Director

c: Engineer-of-Record: John R. Leemon, P.E.
Florida DEP: Jason Andreotta, P.G.