

PROJECT MANUAL

**Wastewater Pump Station No. 4 and
Generator Replacement**

Lake Worth Solicitation No. IFB-16-108

Lake Worth Project No. LS1503

January 2016

Prepared by:

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Engineer's Project
No. B5018.00

PROJECT: Wastewater Pump Station No. 4 and Generator Replacement

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PROJECT: Wastewater Pump Station No. 4 and
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Lake Worth Solicitation No. IFB-16-108
Lake Worth Project No. LS1503

Date: February 11, 2016

00020
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, March 15, 2016, then opened publicly at that time.

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

A pre-bid meeting will be held at the Lake Worth Municipal Golf Course Clubhouse on Tuesday, March 1, 2016 at 9:00 a.m. Attendance by prospective bidders is highly recommended, but not mandatory. If a prospective bidder is unable to attend the pre-bid meeting, they should schedule another time with utility staff to review the project work area, (561) 586-1798.

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.

Contract Documents may be obtained for bidding from DemandStar: www.demandstar.com. All bidders must be a plan holder of record with DemandStar.

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No Bid may be withdrawn for a period of 90 days after the scheduled closing date for the receipt of bids except as otherwise provided in Article 13 of the Instructions to Bidders.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/ Larry Johnson, P.E., Water Utilities Director

Publish: Palm Beach Post – February 14, 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: Wastewater Pump Station No. 4 and Generator Replacement

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 90 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 00300-5 thru 00300-6):

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 210 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 240 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 5% Bid Bond.
- (b) Unit Price Schedule on Page(s) 00300-5 and 00300-6.
- (c) Trench Safety Affidavit on Page(s) 00300-7.
- (d) Schedule of Subcontractors (Page(s) 00300-8)
- (e) Schedule of Suppliers, Equipment and Materials (Page(s) 00300-9).

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

(g) (List other documents as pertinent):

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.

Wastewater Pump Station No. 4 and Generator Replacement Schedule of Values

Item	Item Description	Quantity	Unit	Unit Price	Extended Price
A. General					
1.	Mobilization, Bonds & Insurance	1	LS		\$
2.	Permit Fees	1	LS		\$
3.	Temporary Pumping & Controls	1	LS		\$
4.	Demolition	1	LS		\$
5.	Video-recording of Existing Conditions	1	LS		\$
6.	Record Drawings	1	LS		\$
7.	General Allowance	1	LS		\$ 60,000
	Subtotal A				\$
B. Pump Station (Tremie Method)					
1.	Wetwell	1	LS		\$
2.	Valve Vault	1	LS		\$
3.	8" DIP Pump Discharge Piping, Valves, Quick Connect, & Appurtenances	1	LS		\$
	Subtotal B				\$
C. Site and Utilities					
1.	Temporary Sheeting and Dewatering	1	LS		\$
2.	6' Dia. Manhole	1	EA	\$	\$
3.	36" Ductile Iron Pipe	1	LS		\$
4.	12" Ductile Iron Pipe	1	LS		\$
5.	12" Plug Valve	1	EA	\$	\$
6.	Connect to Existing Forcemain	1	LS		\$
7.	Single Water Service	1	EA	\$	\$
8.	Sanitary Sewer Service	1	EA	\$	\$
9.	Clean Existing 36" Sanitary Sewer Main	1	LS		\$
10.	Asphalt Driveway	90	SY	\$	\$
11.	Stabilized Grass	40	SY	\$	\$
12.	Golf Cart Path Restoration	1	LS		\$
13.	Temporary Access Drive and Construction Fence	1	LS		\$
14.	12" Header Curb	150	LF	\$	\$
15.	Fencing & Gate with Landscape Fabric	1	LS		\$
16.	Earthwork	1	LS		\$
17.	Irrigation System Modification	1	LS		\$
18.	Generator Pad	1	LS		\$
19.	Landscaping and Sod	1	LS		\$
20.	Misc.	1	LS		\$
	Subtotal C				\$
D. Electrical					
1.	Electrical Service & Disconnect	1	LS		\$
2.	Instrumentation	1	LS		\$
3.	Control Panel	1	LS		\$
4.	Electrical Rack, Conduit & Wire	1	LS		\$
5.	75kW Generator, Outdoor Enclosure & Fuel Tank	1	LS		\$
6.	Light Pole	1	EA	\$	\$
	Subtotal D				\$

Wastewater Pump Station No. 4 and Generator Replacement Schedule of Values

Item	Item Description	Quantity	Unit	Unit Price	Extended Price
Alternative Pump Packages					
E. Flygt Pump or Equivalent					
1.	Submersible Pump Package (incl. rail system & accessories)	1	LS	\$	\$
F. Wilo-Emu Pump or Equivalent					
1.	Submersible Pump Package (incl. rail system & accessories)	1	LS	\$	\$
TOTAL BASE BID (A THROUGH D) + PUMP (E)					\$
TOTAL BASE BID (A THROUGH D) + PUMP (F)					\$
G. Pump Station (Alternate Bid)					
1.	Temporary Sheeting and Dewatering	1	LS	\$	\$
2.	Wetwell	1	LS	\$	\$
3.	Valve Vault	1	LS	\$	\$
4.	8" DIP Pump Discharge Piping, Valves, Quick Connect, & Appurtenances	1	LS	\$	\$
Total Schedule E					\$
TOTAL ALTERNATE BID (A THROUGH C AND G) + PUMP (E)					\$
TOTAL ALTERNATE BID (A THROUGH C AND G) + PUMP (F)					\$

PROJECT NO: B5018.00

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 _____
by _____ [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 QUESTIONNAIRE

The following Questionnaire shall be completed by the apparent low bidder and submitted within 5 days of the bid opening when requested by the Owner or Engineer.

1. How many years has your organization been in business? _____

2. What is the last project of this nature that you have completed? _____

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

4. Name three individuals or corporations for which you have performed work and to which you refer:

1. _____
 Name Address

Phone Fax Email

2. _____
 Name Address

Phone Fax Email

3. _____
 Name Address

Phone Fax Email

5. List the following information concerning all contracts in progress as of the date of submission of this bid. (In case of co-venture, list the information for all co-ventures.)

Name of Project	Owner	Total Contract Value	Contracted Date of Completion	% of Completion to Date

6. Has the bidder or his or her representative inspected the proposed project and does the Bidder have a complete plan for its performance? _____

7. What equipment do you own that is available for the work?

8. What equipment will you purchase for the proposed work?

9. What equipment will you rent for the proposed work?

10. State the name of your proposed project manager and give details of his or her qualifications and experience in managing similar jobs.

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

The correct name of the Bidder is _____

The partnership is a Sole Proprietorship, Partnership, or Corporation or Other Type of Entity _____ (Fill In).

The address of principal place of business is _____.

The names of the Corporate Officers, or Partners, or Individuals doing business under a trade name, are as follows:

List all organizations which were predecessors to Bidder or in which the principals or officers of the Bidder were principals or officers.

List and describe all bankruptcy petitions (Voluntary or Involuntary) which have been filed by or against the Bidder, its parent or subsidiaries or predecessor organizations during the past five (5) years. Include in the description the disposition of each such petition.

List and describe all successful Performance or Payment Bond claims made to your surety(ies) during the last five (5) years. The list and descriptions should include claims against the bond of the Bidder and its predecessor organization(s).

List all claims, arbitrations, administrative hearings and lawsuits brought by or against the Bidder or its predecessor organization(s) during the last five (5) years. The list shall include all case names; case, arbitration, or hearing identification numbers; the name of the project over which the dispute arose; and a description of the subject matter of the dispute and the resolution of the same.

List and describe all criminal proceedings or hearings concerning business related offenses in which the Bidder, its principals or officers or predecessor organization (s) were defendants.

Has the Bidder, its principals, officers, or predecessor organization(s) been debarred or suspended from bidding by any government during the last five (5) years? If yes, provide details.

List and disclose any and all business relations with any members of the City Commission.

By my signature below, I guarantee the truth and accuracy of all statements and answers contained herein.

Signature: _____

Printed Name: _____

Company Position: _____

Date: _____

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:

Construction of a new submersible triplex pump station including pumps, piping and valves, electrical equipment, generator, instrumentation and controls and all appurtenances. Demolition of the existing pump station and relocation of the existing generator to Pump Station No. 15.

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 210 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 within 240 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:

- 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 7 pages.
- 8.7. Bid documents as listed in the table of contents of the Project Manual.
- 8.8. Specifications consisting of 109 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 extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.3. 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

AGREEMENT

00500-5

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: Wastewater Pump Station No. 4 and Generator
Replacement

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

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:

ICDC No. 1910-28B (1984 Edition)

Prepared through the joint efforts of the Surety Association of America, Engineers' Joint Contract Documents Committee, The Associated General Contractors of America, American Institute of Architects, American Subcontractors Association, and the Associated Specialty Contractors.

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

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 his 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

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 in 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 and 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 of this Bond or shall permit a copy to be made.

15. DEFINITIONS

15.1. Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor who furnishes 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.

PROJECT: Wastewater Pump Station No. 4 and Generator Replacement

**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:

<u>NAME OF LIENOR</u>	<u>AMOUNT DUE AND UNPAID</u>
	\$

(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:

<u>(ENTITY)</u>	
<u>(SEAL)</u>	By: _____

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 Wastewater Pump Station No. 4 and Generator Replacement

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)

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.

©1983 National Society of Professional Engineers
2029 K Street, N.W., Washington, D.C. 20006

American Consulting Engineers Council
1015 15th Street, N.W., Washington, D.C. 20005

American Society of Civil Engineers
345 East 47th Street, New York, NY 10017

Construction Specifications Institute
601 Madison St., Alexandria, VA 22314

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GENERAL CONDITIONS

ARTICLE I—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 §5C-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 §5C-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 1Sc-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 para-

graph 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 paid 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.

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 ¶5C-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 Indemnification: Supplementary Conditions

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 struc-

tures 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.

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 Sub-contractor, 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.

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.

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).

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, omis-

sion 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.

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:	<u>\$ 1,000,000</u>

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):	
<u>\$ 1,000,000</u>	Each Occurrence
<u>\$ 3,000,000</u>	Annual Aggregate
Property Damage:	
<u>\$ 1,000,000</u>	Each Occurrence
<u>\$ 1,000,000</u>	Annual Aggregate
or a combined single limit of	<u>\$ 1,000,000</u>

(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 item(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 OF AGREEMENT

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 contract 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 date 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.

00840
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

00860
LIST OF DRAWINGS

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

<u>Drawing Title</u>	<u>Drawing Number</u>	<u>No. of Sheets</u>	<u>Dated</u>
Wastewater Pump Station No. 4 And Generator Replacement	44-43-15-157	18	January 2016

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DIVISION 32 – EXTERIOR IMPROVEMENTS

329200	Lawns and Grasses (Gentile Glas Holloway O'Mahoney & Associates).....	5
329300	Exterior Plants (Gentile Glas Holloway O'Mahoney & Associates).....	9

SECTION 01000

GENERAL REQUIREMENTS

1.0 PROJECT LOCATION

The project is located in the City of Lake Worth Municipal Golf Course. See drawings for location of pump station.

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. If a utility is not shown or shown improperly and a conflict arises with the Work in this Contract, Contractor will be justified an increase in Contract Price and/or Contract Time for any changes required in the Work or for required utility relocation, and Contractor may make a claim therefore as provided in Article 11 and/or Article 12 of the General Conditions.
- 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:

<u>Percent of Contract Price Less Mobilization Earned</u>	<u>Allowable Percent of the Lump Sum Price of Mobilization</u>
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 ten (10) 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, eight (8) hard copies and eight (8) 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. The project shall be completed in two phases.
 - 1. Phase 1 shall consist of all work requiring heavy equipment including but not limited to demolition, relocation of the existing generator, new wetwell, valve vault, manhole, piping, control panel, electrical equipment and appurtenances. This phase shall include start-up of the new pump station and placing it in full operation.
 - 2. Phase 2 shall consist of all remaining work including but not limited to demolition of the existing pump station, generator pad and driveway construction, restoration, generator, fencing and landscaping installation. This phase is intended to minimize interruptions to the golf course.
 - 3. Phase 1 shall be substantially complete within 180 days of issuance of Notice to Proceed.
 - 4. Phase 2 shall be substantially complete within 210 days of issuance of Notice to Proceed.

- B. In addition to requirements of the Specifications and Drawings, the Contractor shall submit Construction Schedule and Project Phasing and Temporary Facilities Plan incorporating the project phases noted above to Engineer which will include coordination of the various elements of the Work.

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, $\frac{1}{4}$ 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.

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

Not Used.

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. Under no circumstances will roadway paving Work be allowed to start until the Engineer has reviewed the Record Drawing information for Work constructed within the roadway area that will be paved.
- F. All Record Drawing information such as elevations, distances, location of underground utilities, lake cross-sections, and road cross-sections must be obtained by a Professional Surveyor and Mapper, who is licensed in the State of Florida. The Surveyor will be retained by the Contractor. Information must be signed and sealed.
- G. Record Documents must be available to Engineer for examination at any time during the progress of the Work.
- H. Submit completed Record Documents upon completion of the Work and prior to application for final payment.
- I. Show record information in bold or boxed out to stand out from rest of Drawing.
- J. 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. Drainage
 - 1. Flow line elevation of pipe at headwalls, outfalls and structures.

2. Top elevation of headwalls, structures, and concrete caps.
3. Drainage Control Structures, Baffles, and Weirs. Obtain horizontal dimensions and vertical elevations.
4. Horizontal locations of headwalls, structures, and concrete caps.
5. Location of utilities and miscellaneous structures encountered which are different from or not shown on the Drawings.

C. Lakes, Canals, and Pump Station Intake Channels

1. Cross section at each design cross section shown on the Drawings and at a minimum 100 foot intervals. Obtain elevations at all grade breaks and across bottom from 20 foot beyond top of bank (each side).
2. Determine side slopes.
3. Locate top of bank and the edge of water at the control elevation and plot location on a drawing at the same scale as the construction drawings.

D. Roadways

1. Cross-section elevations at the profile grade line (centerline or edge of median) and at the edge of pavement at the following frequencies:
 - a. Major Roads (collector or higher): At high and low points of the profile grade and at even 100 foot stations in-between.
 - b. Local Roads: At high and low points of the profile grade.
2. Location of utilities and miscellaneous structures encountered which are different from or not shown on the Drawings.
3. Spot elevations in parking lots and access roads.

E. Wastewater/Reclaimed Water

1. Invert elevations in manholes and at end of stubouts.
2. Distance between manholes.
3. Top of manhole elevations.
4. Location of manholes, based on stationing system on Drawings.
5. Calculate slope of gravity mains.
6. Locate end of stubouts and services by stationing and offsetting from the gravity main and downstream manholes.
7. Length of stubouts.
8. Elevations of the top slab, wet well invert, influent pipe inverts, and driveway for lift stations.
9. Details of any design changes.
10. Location of utilities and miscellaneous structures encountered which are different from or not shown on the Drawings.
11. Top of force main elevations and finished grade at 100 foot intervals and at high and low points.
12. Locate force main fittings, valves, air release structures, etc. by stationing and offsetting from gravity wastewater manholes. If manholes are not located nearby, use reference points shown on the Drawings.
13. Elevation and clearances when wastewater mains cross either water mains or drainage pipe.
14. Changes in pipe material.
15. Bottom of wastewater service pipe elevation and top of drainage pipe elevation at all crossings.
16. Top of wastewater service pipe elevation and bottom of watermain elevation at all crossings.
17. Lift station electrical controls and FPL service to control panel.

F. 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 wastewater manholes. If wastewater manholes are not located nearby, use 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 mains cross either wastewater or drainage pipe.
8. Changes in pipe material.

G. Conduit Sleeves

1. Horizontal location and size of conduit.

H. Structural

1. Obtain horizontal and vertical locations and elevations for all structural components, including but not limited to, intake structure including piles and cap, slabs, building and building features, grating, trash rack, etc.

I. General Site

1. Spot elevations shall be taken at a reasonable grid interval for finished grade verification. Obtain spot elevations at all grade or contours (as shown on the Drawings), grade breaks, property lines, and limits of construction.

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 at the pre-construction conference. One copy of the electronic files will be provided on CD/DVD media in AutoDesk Civil 3D 2015 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 with all pay applications and 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.
- E. For pipes and conduits installed by Horizontal Directional Drilling (Section 02156), the Contractor shall furnish drilling logs and drilling profiles to the Engineer and to his Professional Surveyor and Mapper. The Record Information shall be added to the original drawings in AutoDesk Civil 3D 2015 format.

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 are 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 are 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 project area including at a minimum the construction entrance area, the site access route, storage areas, and the construction site.
- 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 project 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 02110
SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Clearing and grubbing.
- B. Removal of pavement and structures.

1.02 REGULATORY REQUIREMENTS

- A. Comply with all applicable federal, state, and local laws and regulations for the prevention, control, and abatement of all forms of pollution and the protection of soil, vegetation, wildlife, fish, and water courses.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PREPARATION

- A. Verify that existing plant life designated to remain is tagged or identified.
- B. Protect utilities that are to remain, from damage.
- C. Protect trees, plant growth, and features to remain as final landscaping.
- D. Protect benchmarks, survey control points, and existing structures from damage or displacement.

3.02 CLEARING AND GRUBBING

- A. Remove and dispose of timber, brush, stumps, roots, rubbish and debris, and all other obstructions resting on or protruding through the surface of the existing ground and the surface of areas to be excavated.
- B. Unless otherwise shown on the Drawings, clearing and grubbing is to be done in the following areas:
 - 1. All areas where excavation and/or grading is to be done.
 - 2. All areas where structures will be constructed, including pipe culverts and other pipelines.
 - 3. In pavement areas and within roadway right of way.
 - 4. Any other areas requiring clearing and grubbing to complete the Work.
- C. In pavement areas, remove roots and other debris to a depth of at least one foot below the ground surface. The surface must then be plowed to a depth of at least six inches and all roots thereby exposed are to be removed to a depth of at least one foot.
- D. All stumps within pavement areas and road right of way are to be completely removed and disposed of.

- E. Where excavation is done, all roots protruding through or appearing on the surface of the completed excavation must be removed to a depth of at least one foot below the excavation surface.

3.03 REMOVAL OF PAVEMENT

- A. Remove and dispose of existing concrete pavement, concrete sidewalk, slope pavement, ditch pavement, asphalt pavement, rock pavement base, curb, and curb and gutter, where designated on the Drawings or where required to be removed because of the construction operations.

3.04 REMOVAL OF STRUCTURES

- A. Remove and dispose of those structures, or portions of structures specified on the Drawings or those structures or portions of structures which need to be removed in order to construct new structures, and other appurtenances or obstructions which are designated on the Drawings.

3.05 DISPOSAL

- A. All removed items, including but not limited to, those indicated in Sections 3.02, 3.03, and 3.04 of this Specification are to be disposed of at an appropriate legal site.

END OF SECTION

SECTION 02210

GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cutting, filling, grading, and rough contouring site.
- B. Compaction requirements.
- C. Finish grading.

1.02 REFERENCES

- A. AASHTO T-180/ASTM D1557-78 - Moisture Density Relations of Soils and Soil Aggregate Mixtures, Using 10 lb. Rammer and an 18 inch Drop.
- B. ASTM D422-63 - Particle-Size Analysis of Soils.
- C. ASTM D2922-81 - Density of Soil-Aggregate in Place by Nuclear Methods.

PART 2 PRODUCTS

2.01 MATERIAL

- A. Fill: Free from large clods, muck, rocks larger than 6 inches, organics or other extraneous material. The maximum size rock allowed in the top 12 inches of the rough and finished grade to be 1 inch, suitable for pavement subgrade.

2.02 SOURCE QUALITY CONTROL

- A. Engineer to review and approve fill material at the source prior to hauling material onsite.

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Identify known below and above grade utilities. Stake and flag locations.

3.02 GRADING

- A. Fill/cut and grade Project site in a neat and uniform manner to conform to the grades detailed on the Drawings. If grades are not specified, grade in a neat and uniform manner to the grades which were existing prior to construction.

3.03 COMPACTION

- A. Spread fill material and level in layers not to exceed 18 inches in thickness, measured loose. Compact each layer using a vibratory roller.
- B. In fill sections that are to be paved, compact to a density not less than 100 percent of the maximum density determined by AASHTO T-99 Method C.
- C. In cut sections and existing sections, the upper one (1) foot of the undisturbed subgrade or foundation grade must be compacted to a density not less than 100 percent of the maximum density determined by AASHTO T-99 Method C.

- D. All subgrade or foundation grades disturbed during construction must be compacted to a density not less than 9 percent of the maximum density determined by AASHTO T-180.
- E. In non-paved areas, compact to 95 percent of the maximum density determined by AASHTO T-180.

3.04 PROTECTION

- A. Protect trees, shrubs, lawns, and other features remaining as a part of the final landscaping.
- B. Protect benchmarks.
- C. Protect existing structures, fences, roads, sidewalks, paving and curbs.
- D. Protect above and below grade utilities which pass through Work area.

3.05 TESTING

- A. Density tests for verifying compaction will be performed by an independent testing laboratory in accordance with Division 1: General Requirements

3.06 FIELD OBSERVATIONS

- A. Owner's representative to review finished grades prior to seeding or placement of sod.

END OF SECTION

SECTION 02220

EXCAVATING, BACKFILLING, AND COMPACTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Excavation for structures, pipelines, lakes, canals, ditches, etc.
- B. Backfilling of structures and pipelines.
- C. Dewatering.
- D. Compacting.
- E. Abandonment using Flowable Fill

1.02 REFERENCES

- A. ASTM C136-84 - Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D2922-81 - Density of Soil-Aggregate in Place by Nuclear Methods.
- C. AASHTO T-180/ASTM D1557-78 - Moisture Density Relations of Soils and Soil Aggregate Mixtures, Using 10 lb. Hammer and an 18 inch Drop.
- D. AASHTO T-99/ASTM D2168,5.5-5.7, Moisture Density Relations of Soils using a 5.5 lb. Hammer and 12-inch drop, Method C Modified.

1.03 REGULATORY REQUIREMENTS

- A. Contractor is responsible for the provisions of the Occupational Safety and Health Administration's excavation safety standards, 29 C.F.R.s. 1926.650 Subpart P, which requires excavations exceeding five (5) feet in depth to be shored or sloped to the angle of repose.

1.04 PREVENTION, CONTROL AND ABATEMENT OF EROSION AND WATER POLLUTION

- A. Contractor shall provide for and be responsible for the prevention, control, and abatement of erosion and water pollution until completion of the Project.
- B. Contractor shall provide all temporary erosion control features necessary to prevent, control, and abate erosion and water pollution.
- C. Contractor shall comply with the water quality standards of the State of Florida. The Contractor is cautioned that during the execution of the Work, creation of turbidity in excess of 29 Nephelometric Turbidity Units (NTU's) above the natural background level and/or directly or indirectly affecting the water quality in the waters of the State in such a manner as to exceed the limitations on the concentration of various constituents for such water as prescribed in Chapter 62-302 of the Florida Administrative Code, is a violation of the water quality standards of the State of Florida.

PART 2 PRODUCTS

2.01 BACKFILL MATERIAL

- A. Backfill with an approved material, free from large clods, rocks larger than 1 inch, organic material or other extraneous material.

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours and datum.
- B. Identify known below and above grade utilities. Stake and flag locations.
- C. Maintain and protect existing utilities remaining which pass through Work area.
- D. Verify stockpiled fill is approved.

3.02 EXCAVATION

- A. Perform the excavation of all substance(s) encountered for construction as shown on the Drawings and/or as specified herein, or as approved by the Engineer by hand dredge methods only. Contractor shall dispose of all substances encountered at an appropriate legal site.
- B. When a masonry or concrete structure rests on an excavated surface other than rock, special care must be taken to avoid disturbing the bottom of the excavation. Final removal of the existing material to foundation grade is not to be started until just before the masonry or concrete foundation is to be placed.
- C. Excavate pipe trenches to a depth as shown on the Drawings. If over-excavation occurs, place a layer of fine crushed rock or compacted coarse sand to secure a firm foundation for the lower one-third of the pipe.
- D. The maximum width of the trench at the top of the pipe must not be greater than 2 feet more than the nominal diameter of the pipe, unless otherwise specified. If this maximum is exceeded, it will be the Contractor's responsibility to provide adequate support (concrete cradle or crushed rock and compacted coarse sand) at the location of the trench width over excavated.
- E. Keep pipe laying operations as close to the excavation as practical during the execution of the Work.
- F. If rock is encountered at the foundation grade of a masonry or concrete structure, excavate the rock in such a manner as to allow the solid rock to be exposed. Prepare in horizontal beds for receiving the masonry or concrete. Remove all loose and disintegrated rock or thin strata. Cut back roots to 12 inches below the foundation grade.
- G. If rock is encountered at the grade line of a pipe line, remove the rock so that at no place will it be closer than 6 inches to the finished pipe line. After the excavation is completed, place and tamp a bed of selected backfill (coarse sand and fine crushed rock) to at least 6 inches deep. Cut back roots to 12 inches below pipe grade.
- H. Remove any water accumulated in the pipe trench and/or structure excavation and keep the excavation de-watered until the bedding is complete. Accomplish in a manner so as to not create any nuisance to adjacent property or public thoroughfare. Do not use the pipeline being installed as a drain for such water. Meet all laws, codes, ordinances, and government regulations when de-watering.
- I. Provide all bracing, sheeting, and shoring necessary to perform and protect all excavations, as required for safety, or in accordance with governing laws. Remove all sheeting during backfilling operations except as otherwise noted herein or approved by the Engineer. Remove bracing, sheeting, and shoring in such a manner as not to disturb the completed Work.

Whenever bracing or shoring is driven to a depth below the top of pipe elevation, that portion of the sheeting below the top of the pipe must not be disturbed or removed. Whenever bracing or

sheeting is driven for protection of trench walls in a water-bearing soil, no portion of such sheeting is to be removed below existing ground water table level unless otherwise approved by the Engineer.

- J. Unsuitable Foundation - In case the soil conditions encountered at the grade line of the pipe trench or structure excavation are found to be unsuitable, the Engineer must be notified to review the character of the foundations prior to continuing the Work.

3.03 BACKFILLING

- A. Backfilling of structure (manholes, pump stations, sidewalks, etc.) excavations and required fill under structure slabs are to be done in horizontal lifts not exceeding eight inches in depth (compacted thickness), and compacted to a density of not less than 9 percent of the maximum density determined by AASHTO T-180.
- B. Place backfill material for pipe excavation evenly and carefully around and over pipe and under lower sections of pipe in 6-inch maximum lifts. Hand-tamp backfill around the pipe. Each lift is to be thoroughly and carefully rammed until one foot of cover exists over the pipe. The remainder of the backfill is to be placed in eight inch lifts (compacted thickness), moistened, and mechanically compacted to a density of not less than 100 percent of the maximum density as determined by AASHTO T-99 Method C, unless otherwise noted. Water settling may be utilized at the option of the Contractor, however, the dewatering system must remain in service until all required density determinations are performed.
- C. For structures and rigid pipelines where the backfill lies within a pavement subgrade, the backfill must be compacted to a density not less than 100 percent of the maximum density determined by AASHTO T-99 Method C.
- D. For flexible pipe lines (i.e. PVC pipe or corrugated metal pipe) where the backfill lies within a pavement subgrade, the subgrade backfill to 6 inches above the top of the pipe must be compacted to a density not less than 100 percent of the maximum density determined by AASHTO T-99 Method C. The remaining backfill to grade is to be compacted to a density not less than 98 percent of the maximum density determined by AASHTO T-180.
- E. Compact the upper one (1) foot of undisturbed subgrade or foundation grade disturbed during construction to a density of less than 98 percent of the maximum density as determined by AASHTO T-180.

3.04 PIPELINE ABANDONMENT OR TRENCH FILL USING FLOWABLE FILL AND EXCAVATABLE FILL

- A. Pipelines where noted on the drawings to be grouted and abandoned in place shall be filled with excavatable flowable fill (grout) per Section 121, FDOT Standard Specifications for Road and Bridge Construction, Latest Edition.
- B. Contractor shall locate his setups and weep points to assure that the pipe has been completely filled and furnish documentation to that effect in the form of logs, photographs, grout truck delivery tickets and such like.

3.05 TOLERANCES

- A. Top Surface: Plus or minus 0.1 foot.

3.06 TESTING

- A. Density tests for subgrade and backfill shall be performed by an independent testing laboratory in accordance with Division 1: General Requirements

3.07 FIELD OBSERVATIONS

- A. All structures, pipelines, pipeline joints, and other construction are subject to field observation by the Engineer and Owner prior to backfilling.

END OF SECTION

SECTION 02221

DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Demolish existing buildings, including foundation and septic system.
- 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 02230
ROCK BASE COURSE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Compacted subgrade.
- B. Stabilized subgrade.
- C. Coquina, limerock, and shellrock base courses.

1.02 REFERENCES

- A. Florida Department of Transportation - Standard Specifications for Road and Bridge Construction, 2007 Edition, herein after referred to as the FDOT Specifications. This document must be onsite during the Work.
- B. ASTM C136-01 - Sieve Analysis of Fine and Coarse Aggregates.
- C. ASTM D2922-96 - Density of Soil-Aggregate in Place by Nuclear Methods.
- D. AASHTO T 180/ASTM D1557-00 – Laboratory Compaction Characteristics of Soil Using Modified Effort.

1.03 TESTS

- A. Testing of the rock for compliance with this specification will be performed when it is delivered to the project site by an independent testing laboratory. Contractor is responsible for scheduling tests and for the coordination of the testing with the testing laboratory and Engineer. Tests are to be paid for as specified in the Section 01000: General Requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Compacted Subgrade: Local sands approved in advance by the Engineer. Free from large clods, rocks larger than one inch, organic material or other extraneous material.
- B. Stabilized Subgrade: In accordance with Section 914 of the FDOT Specifications.
- C. Coquina Rock Base: In accordance with Section 915 of the FDOT Specifications.
- D. Limerock Base: In accordance with Section 911 of the FDOT Specifications.
- E. Shellrock Base: In accordance with Section 913A of the FDOT Specifications.
- F. Prime Coat: Meets Sections 300-2.1 and 916 of the FDOT Specifications.

PART 3 EXECUTION

3.01 PREPARATION

- A. Prepare, compact, and grade compacted subgrade in accordance with Section 120-9 of the FDOT Specifications.
- B. Prepare, compact, and grade stabilized subgrade in accordance with Section 160-5 of the FDOT Specifications, 2007 Edition.

- C. Clean subgrade surface of all foreign matter.
- D. Verify gradients and elevations of subgrade are correct.

3.02 PLACING BASE MATERIAL

- A. Spread base material over prepared subgrade to a total compacted thickness as shown on the Drawings.
- B. Place in 6 inch maximum lifts. Compact to 98 percent of maximum density per AASHTO T 180, Method D.
- C. Check finished surface with a template cut to the required crown and with a 15 foot straight edge laid parallel to the centerline of the pavement. Correct all irregularities greater than 1/4 inch by scarifying, and removing or adding base material as may be required. Re-compact area to meet specified density requirements.

3.03 PRIME COAT APPLICATION

- A. Apply prime coat in accordance with Section 300-7 of the FDOT Specifications except Contractor to apply prime coat at a rate of 0.15 gallons per square yard over a base course free of all loose and foreign materials which may prevent proper bond. The moisture content of the base must not exceed 90 percent of the optimum moisture content of the material.

3.04 FIELD OBSERVATIONS

- A. Engineer to review the subgrade prior to placing base course.
- B. Engineer to review the finished base prior to application of the prime coat and paving.

3.05 PROTECTION

- A. Any roadway base damaged, disturbed, or destroyed in excess of maximum pipe trench widths detailed on the Drawings must be replaced in accordance with the Drawings and Specifications at no additional expense to the Owner.

END OF SECTION

SECTION 02513

TYPE S ASPHALTIC CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Materials, surface preparation, and placement of Type S asphaltic concrete pavement.

1.02 REFERENCES

- A. Florida Department of Transportation - Standard Specifications for Road and Bridge Construction, 2000 and 2007, herein after referred to as the FDOT Specifications. These documents must be onsite during the Work.

1.03 SUBMITTALS

- A. Submit a job mix formula for each asphaltic paving mixture in accordance with Section 331-4.3 of the 2000 Standard Specifications (2000 FDOT Specifications).

PART 2 PRODUCTS

2.01 MATERIALS

- A. Tack Coat: Meets Section 300-2.3 of the FDOT Specifications, 2007 Edition.
- B. Type S Asphaltic Concrete: Meets the requirements of Section 331 of the 2000 FDOT Specifications.

Requirements for mixing temperature must conform to those specified in Section 330-6.3 of the 2007 FDOT Specifications.

PART 3 EXECUTION

3.01 PREPARATION

- A. Adjust manhole rims and valve boxes to finished grade. Cost of Work to be at the unit prices on the Bid Form. If there is no separate bid item for these adjustments, the cost is to be included in the cost of the asphalt.
- B. Apply an asphaltic tack coat to existing asphaltic concrete surfaces to be repaved and to new asphalt base courses. Remove all loose and foreign material from the paved surface. Apply in accordance with Section 300-8 of the 2007 FDOT Specifications.
- C. Clean surface of all sand and debris prior to placing surface course.

3.02 PLACING ASPHALT PAVEMENT

- A. Place in accordance with Section 330-9 of the 2007 FDOT Specifications.
- B. Compact asphalt in accordance with Section 330-10 of the 2007 FDOT Specifications. Compact to an average density of at least 98 percent of the valid control strip density. The control strip density is determined by the method defined in Section 330-11.3.2 of the 2000 FDOT Specifications.
- C. Prepare joints in accordance with Section 330-11 of the 2007 FDOT Specifications. Maintain a smooth transition between existing pavement and new pavement.
- D. Maintain all pavement cuts to the approval of the Engineer until the Project is complete.

- E. Surface course cut during construction must have all edges saw cut prior to replacement.

3.03 SURFACE REQUIREMENTS

- A. The finished surface must be of uniform texture and compaction. Any pulled, torn, or loosened asphalt, or any areas with open pores, segregation, sand streaks, sand spots, or ripples must be corrected.
- B. Check finished surface with a 15-foot straightedge. Correct deficiencies in excess of 3/16-inch.
- C. Correct deficiencies in accordance with Section 330-12.5 of the 2007 FDOT Specifications.

3.04 THICKNESS ALLOWANCES

- A. The maximum allowable deficiency from the layer thickness specified on the Drawings is as follows:
 - 1. For pavement of a specified thickness of 2-1/2 inches or more: 1/2 inch.
 - 2. For pavement of a specified thickness of less than 2-1/2 inches: 1/4 inch.
- B. Correct deficiencies either by replacing the full thickness for a length extending at least 50 feet beyond each end of the deficient area for the full width of the paving lane or (when permitted by the Engineer) by overlaying.

3.05. LEVELING COURSE REQUIREMENTS

- A. Prepare in accordance with Section 330-9 of the 2007 FDOT Specifications.
- B. Place mixture in accordance with Sections 330-9 of the 2007 FDOT Specifications.
- C. Compact per Section 330-10 of the 2007 FDOT Specifications.
- D. Method of Measurement will be per Section 331-6 of the 2000 FDOT Specifications. Engineer and Contractor will agree and physically mark in the field all locations to have a level course applied. Engineer will collect tonnage tickets at the time of placement and note that the material placed was a leveling course.

3.06 FIELD OBSERVATIONS

- A. Engineer to observe paving activities and finished surface.

3.07 PROTECTION

- A. Any roadway surface damaged, disturbed, or destroyed in excess of maximum trench widths detailed on the Drawings must be replaced in accordance with the Drawings and Specifications at no additional expense to the Owner.

END OF SECTION

SECTION 02523

SIDEWALKS, DRIVEWAYS, AND CURBS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete sidewalks, driveways, curbs, and gutters.

1.02 RELATED SECTIONS

- A. Section 02210 - Grading.

1.03 REFERENCES

- A. AASHTO T 180/ASTM D1557-00 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
- B. ACI 347R-94 – Guide to Formwork for Concrete.
- C. ASTM A185-97 - Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
- D. ASTM A615-01 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- E. ASTM C33-01 - Concrete Aggregates.
- F. ASTM C39-01 - Compressive Strength of Cylindrical Concrete Specimens.
- G. ASTM C42-99 - Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- H. ASTM C94-00 - Ready-Mixed Concrete.
- I. ASTM C143-00 - Slump of Hydraulic Cement Concrete.
- J. ASTM C150-00 - Portland Cement.
- K. ASTM C260-01 - Air-Entraining Admixtures for Concrete.
- L. ASTM C309-98 - Liquid Membrane - Forming Compounds for Curing Concrete.
- M. ASTM D1751-99 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction.
- N. ASTM D2922-01 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods.

1.04 SUBMITTALS

- A. Concrete mix design indicating the proportions of cement, coarse aggregate, fine aggregate, water, and admixtures. Mix design sheet must also indicate slump, design strength, and water-cement ratio.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Forms: Conform to ACI 347.

- B. Reinforcing Steel: ASTM A615, Grade 60, new deformed billet steel.
- C. Welded Steel Wire Fabric: Plain type, ASTM A185.
- D. Expansion Joints: 1/2 inch thick preformed non-extruding joint filler meeting ASTM D1751.
- E. Concrete: Cement (ASTM C150, Type I), aggregates (ASTM C33), and potable water mixed in accordance with ASTM C94. Minimum of 470 lbs. of cement per cubic yard of concrete. Water-cement ratio less than or equal to 0.55. Slump of 0-5 inches. 3000 psi minimum compressive strength at 28 days.
- F. Air-Entraining admixture to be from two to six percent.
- G. Curing Compound: ASTM C309, Type 1 or 1-D, Class A.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

- A. Prepare subgrade in accordance with Section 02210.
- B. Compacted density to be at least 98 percent of the maximum density determined by AASHTO T180.
- C. Verify gradients and elevations of subgrade are correct.
- D. Just prior to placing concrete, moisten subgrade and forms to provide a uniform dampened surface at the time concrete is placed.

3.02 CONCRETE PLACEMENT

- A. Maintain concrete temperature at time of placement below 90 degrees Fahrenheit.
- B. Deposit concrete on the subgrade in a manner which will minimize rehandling.
- C. Do not disturb expansion joints.
- D. Consolidate concrete against and along the faces of all forms, and along the full length on both sides of all joint assemblies.

3.03 JOINT CONSTRUCTION

- A. Contraction Joints for Sidewalks and Driveways: Sidewalk joints are to be spaced 5 feet on center unless noted otherwise on Drawings. Driveway joints are to be spaced 15 to 18 feet on center unless noted otherwise on Drawings. Use saws equipped with shatterproof abrasive or diamond rimmed blades. Cut joints into concrete as soon as the surface will not be ravelled or otherwise damaged by the cutting action. Cut slot, 3/16 inch wide and not less than 1 1/2 inches deep. Joints must be completed between four (4) and twelve (12) hours after placing concrete.
- B. Contraction Joints: The maximum joint spacing to be 15 feet. Depth no less than one-fourth (1/4) the pavement thickness. Width, one-eighth (1/8) inch to one-fourth (1/4) inch. Joints must be continuous across the slab unless interrupted by a full depth joint and must extend completely through any integral curbs. Alignment may be skewed or warped where necessary to reach points of stress concentration. Form using saws equipped with shatterproof abrasive or diamond rimmed blades. Cut joints into concrete paving as soon as the surface will not be ravelled or otherwise damaged by the cutting action. Joints must be completed between four (4) and twelve (12) hours after concrete has been placed. Zip strips may be used in appropriate locations.

- C. Construction Joints: Place full depth construction joints at the end of concrete pours and at locations where placement operations are stopped for a period of thirty (30) minutes or more except where such pours terminate at expansion joints.
- D. Expansion Joints for Sidewalks and Driveways: Construct at 100 foot intervals (unless noted otherwise on Drawings), between sidewalk and driveways, at sidewalk intersections, and around all other fixed objects within the sidewalk or driveway. Joints must contain preformed joint filler for the full depth. Edges must be finished with a 1/4 inch radius.
- E. Expansion Joints for Curbs: Construct at all inlets and radius points, where new curb abuts an existing fixed object, and at intervals of 500 feet. Joints must contain 1/2 inch preformed joint filler for the full depth of the curb.

3.04 FINISHING

- A. Adding water to the surface of the concrete to assist in finishing operations is not permitted.
- B. A uniform gritty non-slip finish must be provided by brushing the surface with a stiff-bristled broom or by dragging a 'burlap bag' over the surface just before the water sheen disappears.
- C. After the final finish has been applied, but before the concrete has become nonplastic, the edges on each side of expansion joints, construction joints, and along any structure extending into the concrete are to be carefully rounded to a 1/4 inch radius. Finish sidewalk and driveway edges with a 1/4 inch radius edging tool. Produce a well-defined and continuous radius and a smooth, dense mortar finish. Remove all concrete from the top of the joint filler.

3.05 CURING

- A. After the finishing operations have been completed and as soon as the concrete has hardened sufficiently such that marring of the surface will not occur, the entire surface and the edges of the newly placed concrete are to be cured using a liquid curing compound. Rate of application to be 200 square feet per gallon or as recommended by the manufacturer.
- B. Do not leave the concrete exposed for a period in excess of 30 minutes between stages of curing or during the curing period.

3.06 BACKFILLING

- A. After the concrete has set sufficiently, but not later than three days after pouring, refill the spaces in front and back of curb/sidewalk to the required elevation with suitable material.

3.07 FIELD OBSERVATIONS

- A. The subgrade and formwork prior to placing concrete.
- B. Concrete placement activities.
- C. Furnish a delivery ticket for each batch of concrete unloaded if so requested by the Engineer.

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 or 'Fast Grip' gaskets as manufactured by American Ductile Iron Pipe.
- H. Restrain fittings using 'Megalugs' as manufactured by Ebaa Iron Sales, Inc. or approved equal.

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 either cannon flushed or 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 02626

PVC PRESSURE PIPE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. PVC pipe for , raw watermains forcemains and reclaimed watermains, 4 inch through 8 inch diameter.

1.02 RELATED SECTIONS

- A. Section 02220 - Excavating, Backfilling and Compacting.
- B. Section 02675 - Disinfecting Water Mains.

1.03 REFERENCES

- A. ASTM D1784-99 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
- B. ASTM D2241-00 - Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
- C. ASTM D2672-96 - Joints for IPS PVC Pipe Using Solvent Cement.
- D. ASTM F477-99 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- E. ANSI/AWWA C153/A21.53-11 (latest revision) - Ductile-Iron Compact Fittings, 3 inch Through 64 inch.
- F. AWWA C605-94 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
- G. AWWA C900-97 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 inch through 12 inch, for Water Distribution.
- H. AWWA C905-97 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-inch through 48-inch, for Water Distribution.

1.04 SUBMITTALS

- A. Manufacturer's technical product data for pipe and fittings.

1.05 QUALITY ASSURANCE

- A. Pipe for watermains, forcemains, and reclaimed watermains must be marked with the following information: nominal size and OD, base material code designation, dimension ratio number, AWWA pressure class, AWWA designation number, manufacturer's name or trademark,

production code, and the seal of the testing agency that verified the suitability of the pipe material for the proposed service when applicable.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipe to the site in such a manner as to provide adequate protection for the pipe ends and 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 for Pressure Pipeline: 4-inch through 12-inch diameter shall be AWWA C900, Class 150, DR 18, 4-inch through 48" nominal diameter shall be AWWA C905, Class 165, DR25.
- B. Fittings: ANSI/AWWA C153-11. For Wastewater Systems provide an epoxy lining using Protecto 401. Apply in strict conformance with the manufacturer's recommendations.
- C. Thrust Blocks: Concrete with a minimum compressive strength of 2500 psi at 28 days. Allowed only where called for on the Drawings or where approved by the Engineer.
- D. Restrained Fittings: 'Megalugs' as manufactured by Ebaa Iron Sales, Inc. or approved equal.
- E. Restrained Pipe Joints: Series 1600 or 2800 Restraint Harness by Ebaa Iron Sales, Inc. or approved equal.
- F. Flanged Connections: Flanges, as indicated on the Drawings or as required by connecting pipe, shall be AWWA C207, Class D and shall have back-up rings constructed of 316 stainless steel. All flanged connections shall have a full face neoprene flange gasket (non-asbestos) with minimum thickness of 1/16-inch. Bolts and all hardware shall be 316 stainless steel.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install PVC pipe, fittings and joints in accordance with the manufacturer's instructions and AWWA C605.
- B. Install pipe with the spigots pointing in the direction of flow except in a looped water distribution system where the flow in the pipe line may be either way. In a looped system, lay pipe lines with the bell ends facing in the direction of laying pipe.
- C. The interior of the pipe and fittings are to 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.
- D. No trench water is allowed to enter the pipe or fittings. During suspension of Work for any reason at any time, a suitable stopper must be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe.

- E. Lay pipe lines to grade and alignment as shown on the Drawings.
- F. Provide minimum 36 inch depth of cover except where otherwise shown on the Drawings.
- G. Any pipe and/or fitting found defective must be removed immediately and replaced with sound pipe.
- H. Dig bell holes in the pipe subgrade to accommodate the bells. Bell holes must be deep enough to insure that the bell does not bear on the bottom of the hole and the holes are not to be excessively wide in the longitudinal direction of the pipe line. When the pipe and fittings are laid, the barrels must be in contact with the foundation throughout its full length exclusive of the bell.
- I. All reaction forces at bends (11-1/4 degrees or greater), tees, valves, and plugs are to be restrained from movement by mechanical restraints as specified on the Drawings.
- J. 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 either canon flushed or swabbed by forcing under water pressure a soft sided swab through the mains to remove dirt and any other foreign matter.
- B. When canon 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 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 nor 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 canon flushing/swab cleaning, as applicable, is to be included in the cost of the pipe.

3.03 HYDROSTATIC TESTING

- A. All pressure mains are to 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 provide his 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, air must be expelled completely from the pipe, valves, and hydrants.
- F. Subject pipelines to a gauge pressure of 150 psi. Fire service lines are to be subjected to a gauge pressure of 200 psi.
- 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 AWWA Standard C605, latest revision.
- 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 watermains in accordance with Section 02675.

3.05 FIELD OBSERVATIONS

- A. Fittings, valves, thrust blocks, mechanical restraints, canon 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 observation 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 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 02642

PLUG VALVES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Plug valves.
- B. Valve boxes.

1.02 SUBMITTALS

- A. Detailed manufacturer's information for valves and valve boxes.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Provide valves with manufacturer's name, year of manufacture, valve size, and pressure rating clearly cast on the body of each valve.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide valves of same manufacturer throughout where possible.

2.02 VALVE CONNECTIONS

- A. Provide valves suitable to connect to adjoining piping as specified for pipe joints. Use pipe size valves.
- B. Thread pipe sizes 2 inches and smaller.
- C. Flange pipe sizes 2-1/2 inches and larger.
- D. Use grooved body valves with mechanical grooved jointed piping.

2.03 PLUG VALVES

- A. General: Eccentric plug type with bodies of semi-steel. Resilient plug facings. Joint ends as detailed on the Drawings or to conform to the pipe line in which the valve is to be installed. Valve port areas of 24-inch diameter and larger valves to be 100 percent full pipe area. Port areas of 4-inch to 20-inch diameter valves to be at least 80 percent of full pipe area. Seats in 3-inch and larger valves to have a welded-in overlay of not less than 90 percent pure nickel on all surfaces contacting the plug face. Valves through 20-inches in diameter to have stainless steel permanently lubricated upper and lower plug stem bushings. Valves 24-inches and larger to have permanently lubricated stainless steel upper and lower plug stem sleeves and bronze bushings. All valves 4-inches and larger are to be of the bolted bonnet design. Design valves so that they can be repacked without removing bonnet from valve. Provide adjustable multiple U-ring type packing. Zinc plate all exposed nuts, bolts, springs and washers. Buried or submerged valves are to have stainless steel nuts, bolts, springs and washers. Design valves for tight shutoff with pressure in either direction. Prior to shipment from the factory, test each valve by submitting it to a hydraulic pressure equal to twice the specified working pressure. 150 psi minimum design working pressure.

- B. Valve Actuators: Manual actuators for valves up to 6 inches in diameter and gear actuators on valves 6 inches in diameter and larger. Enclose gearings and run oil in seals on all shafts to prevent entry of dirt and water into the actuator. Furnish shaft bearings in the actuator with permanently lubricated bronze bushings. Clearly indicate valve position and provide an adjustable stop to set close travel limit. Valve packing adjustment on non-submerged valves must be accessible without removing the actuator from the valve. On valves and actuators for below ground and submerged service, provide seals on all shafts and gaskets on valve and actuator covers to prevent the entry of water. Enclose actuator mounting brackets for below ground and submerged surfaces and have gasket seals. Below ground valves are to have an actuating nut.
- C. Furnish a valve key for each valve supplied under this Contract.

2.04 VALVE BOXES

- A. Cast iron construction, adjustable type.
- B. Cast in the cover the word 'SEWER'.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install valves at locations shown on the Drawings.
- B. Install valves with stems upright or horizontal, not inverted.
- C. Provide valve boxes for all buried valves. Depth of box to be suitable for the depth of the valve below grade.
- D. Mount boxes with the centerline of the box coincidental with the perpendicular to the centerline of the valve.

3.02 FIELD OBSERVATIONS

- A. All valves constructed underground will be observed at the option of the Engineer prior to backfilling.

END OF SECTION

SECTION 02644
CHECK VALVES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Check valves with a nominal pipe size of 2 inch through 24 inch.

1.02 REFERENCES

- A. AWWA C508-09 - Swing-Check Valves for Waterworks Service, 2 inch through 24 inch NPS.

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. Conform to the requirements of AWWA C508.
- B. End connections suitable for connecting to adjoining piping.
- C. Suitable for wastewater service as well as water works service.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with the manufacturer's recommendations.

END OF SECTION

SECTION 02648

AIR RELEASE VALVES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Air release valves suitable for wastewater.
- B. Air/vacuum combination valves for wastewater.

1.02 SUBMITTALS

- A. Submit product literature that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, parts list drawings, operation and maintenance manuals, and warranty information.
- B. 'Affidavit of Compliance' from the manufacturer indicating that the valves and other products or materials furnished meet the requirements of this Specification.

1.03 QUALILTY ASSURANCE

- A. Supplier shall have at least five (5) years experience in the manufacture of air valves.
- B. Provide air release valves with corrosion resistant nameplate with manufacturer's name, year of manufacture, valve size, class, etc. attached to the body or cover.
- C. Valves of the same manufacturer throughout.

PART 2 PRODUCTS

2.01 GENERAL

- A. All materials that come in contact with the water being treated or the finished water shall be on either the EPA or NSF lists of approved products for use in contact with potable water. Manufacturers shall submit an affidavit with the shop drawings indicating approval by the EPA or NSF for the materials used in products that come in contact with the water in accordance with Rule 62-555.320(3), Florida Administrative Code.

2.02 MANUFACTURER

- A. Air release valves shall be:
 - 1. Model D-020 combination air valve for wastewater with reinforced nylon body as manufactured by ARI Flow Control Accessories.
 - 2. Series 400 as manufactured by APCO Willamette Valve, and Primer Company.
 - 3. Model 986 Automatic Air and Vacuum Valve as manufactured by H-Tech, Marietta, GA or approved equal.

2.03 AIR RELEASE VALVES

- A. Air release valves shall be automatic float operated valves designed to release air from a piping system while the system is in operation and under pressure.
- B. The valve body shall be threaded with NPT or flanged inlets.

- C. The cover shall be bolted to the valve body and sealed with a flat gasket.
- D. The valve body shall be constructed of either reinforced nylon or 316 stainless steel.
- E. Seal shall be accomplished via a replaceable orifice button or needle, and shall provide drop tight shutoff to the full valve pressure rating.
- F. A vacuum check shall be supplied on the outlet to eliminate the possibility of air entering the system where the pressure decreases, or if a vacuum is drawn.
- G. Air release valves shall be capable of passing 20 CFM at 250 psi working pressure and able to withstand 250 psi test pressure.

2.04 MATERIALS OF CONSTRUCTION

- A. Cover, float, seat, internal linkage and trim, and hardware shall be non-corrosive materials.
- B. Seal shall be Buna-N.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Air release valve shall be installed in accordance with manufacturer's written Installation and Operation Manual and approved submittals.

END OF SECTION

SECTION 02831

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fence framework, fabric, and accessories.
- B. Excavation for post bases.
- C. Manual gates and related hardware.

1.02 REFERENCES

- A. ASTM A53-01-Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- B. ASTM A121-99 - Zinc-Coated (Galvanized) Steel Barbed Wire.
- C. ASTM A123-01 - Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A307-00 - Carbon Steel Bolts and Studs, 60000 PSI Tensile Strength.
- E. ASTM A392-96 - Zinc-Coated Steel Chain-Link Fence Fabric.
- F. ASTM A563-00 - Carbon and Alloy Steel Nuts.
- G. ASTM B6-00 - Zinc.
- H. ASTM C94-00 - Ready-Mixed Concrete.
- I. ASTM F552-01 - Terminology Relating to Chain Link Fencing.
- J. ASTM F567-00 - Practice for Installation of Chain-Link Fence.
- K. ASTM F626-96 - Fence Fittings.
- L. ASTM F668-99 - Poly (Vinyl Chloride) (PVC) and other Organic Polymer - Coated Steel Chain-Link Fence Fabric.
- M. ASTM F900-94 - Industrial and Commercial Swing Gates.

1.03 SUBMITTALS

- A. Manufacturer's catalog cuts with printed specifications.
- B. Shop Drawings with complete details of fence and gate construction, fence height, post spacing, dimensions and unit weights of framework, and concrete footing details.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Framing (Steel): ASTM A53, Schedule 40 steel pipe.

- B. Fabric Wire (Steel): ASTM A392.
- C. Barbed Wire: ASTM A121.
- D. Bolts: ASTM A307, Grade A.
- E. Nuts: ASTM A563, Grade A.
- F. Concrete: ASTM C94; Normal Portland Cement, 3000 psi minimum compressive strength at 28 days, 3 inch slump, 1 inch nominal sized coarse aggregate.

2.02 COMPONENTS

- A. Line Posts: 2.375 inch nominal diameter galvanized pipe (3.65 lbs/ft).
- B. Corner and End Posts: 3.00 inch nominal diameter galvanized pipe (5.79 lbs/ft).
- C. Gate Support Post: 4.00 inch nominal diameter galvanized pipe (9.11 lbs/ft).
- D. Top and Brace Rails: 1.625 inch nominal diameter (2.72 lbs/ft), plain end, sleeve coupled.
- E. Gate Frame: 2.00 inch nominal diameter galvanized pipe (2.72 lbs/ft).
- F. Fabric: 2 inch diamond mesh interwoven wire, 9 gauge steel core, top selvage twisted tight, bottom selvage knuckle end closed.
- G. Brace and Tension Bands: 1/8 inch thick steel.
- H. Tension Bar: 1/4 inch thick steel.
- I. Tension Wire: 9 gauge steel, zinc galvanized at the rate of 1.2 oz/SF.
- J. Tie Wire: 9 gauge steel, zinc galvanized at the rate of 1.2 oz/SF.
- K. Caps: Malleable iron, galvanized; sized to post diameter, stainless steel set screw retainer.

2.03 ACCESSORIES

- A. Barbed Wire: 12-¹/₂ gauge, 4 point, 5 inch spacing, 14 gauge round barbs (when shown on drawings).
- B. Extension Arms: Cast steel to accommodate 3 strands of barbed wire, single arm, sloped to 45 degrees. Withstand a weight of 200 pounds.
- C. Gate Hardware: Fork latch for single swing gate, center gate stop and drop rod for double swing gates, keeper for double swing gates, hardware for padlock, and two 180 degree hinges per leaf.

2.04 FINISHES

- A. Zinc Coating
 - 1. Components and Framing: ASTM A123.
 - 2. Fabric: ASTM A392, 1.2 oz./sq. ft.
 - 3. Hardware: ASTM A153.
 - 4. Extension Arms: ASTM A153.
 - 5. Barbed Wire: ASTM A121, 0.80 oz./sq. ft.

B. Vinyl Coating (when specified on the Drawings)

1. General: Factory coated (unless noted otherwise), fusion bonded PVC.
2. Components and Framing: 10-14 mils vinyl coating over galvanizing per ASTM A123.
3. Fabric: 7-12 mils vinyl coating per ASTM F668, Class 2B over 0.3 oz./sq. ft. of galvanizing per ASTM A641.
4. Hardware: Spray paint hardware in the field to match vinyl coating.
5. Extension Arms: 10-14 mils vinyl coating over galvanizing per ASTM A153.
6. Barbed Wire: 7-12 mils vinyl coating over 0.80 oz./sq. ft. of galvanizing per ASTM A121.

PART 3 EXECUTION

3.01 SITE PREPARATION

- A. Before installing chain-link fence, all necessary site clearing and grading is to be completed.
- B. Where the clearing and grubbing for the Project does not include the area occupied by the fence, clearing is to be done to a width of at least two feet on each side of the fence line, except that the Engineer may direct that valuable trees be left in place. Do not extend clearing beyond the right of way.

3.02 INSTALLATION

A. General

1. Install framework, fabric, accessories, and gates in accordance with ASTM F567.
2. Install all fasteners with the nuts on the inside face of the fence.

B. Posts

1. Space at intervals not exceeding 10 feet on center. Measure the interval parallel to the grade of the fence and in the line of fence from center to center of the post.
2. Set line posts in concrete foundations of not less than 10 inches in diameter and 2.5 feet deep below grade.
3. Set corner and end posts in concrete foundations not less than 12 inches in diameter and 3.5 feet deep below grade.
4. Set gate posts in concrete foundations not less than 18 inches in diameter and 4 feet deep below grade.
5. Slope concrete away from the posts to provide for proper water drainage.
6. Install corner posts whenever the fence alignment changes 10 degrees or more.
7. Provide fence height as indicated on the Drawings.

C. Gate & End Post Bracing

1. Brace each gate and end post to adjacent line post with horizontal center rail.
2. Braces are not required on fences 6 feet high or less.

D. Top Rail

1. Provide a top rail so that a continuous brace from end to end of each stretch of fence is formed.
2. Support at each line post.
3. Securely fasten to end posts and join with sleeves or coupling to allow for expansion and contraction.

E. Fabric

1. Place chain-link fabric on the outside of the area to be enclosed or as directed by the Engineer.
2. Stretch fabric between end posts or at intervals of 100 feet maximum, whichever is less.
3. Position bottom of fabric two inches above finished grade. Over irregular ground, a minimum clearance of one inch and a maximum of six inches will be permitted for a length not to exceed eight feet.
4. Fasten fabric to line posts at intervals not exceeding 15 inches and to top rail at intervals not exceeding 24 inches with wire ties.
5. Provide bands or clips of adequate strength to attach fabric to tension bars at all corner, end, and gate posts at intervals not exceeding 12 inches.
6. Do not place fabric until posts have been permanently positioned and concrete foundations have attained adequate strength.

F. Gates

1. Provide concrete center drop to foundation depth and drop rod retainers at center of double gate openings.
2. Install gates with fabric and barbed wire overhang to match fence. Install three hinges per leaf, latch catches, drop bolt, foot bolts and sockets, torsion spring retainer, retainer and locking clamp.

G. Barbed Wire and Support Arms

1. Pull taut to remove all sags.
2. Firmly install in the slots of the extension arms and secure to a post or terminal arm.
3. Stagger barbs.

H. Electrical Grounds

1. Wherever a power line passes over the fence, a ground must be installed directly below the point of crossing. The ground rod is to consist of an aluminum or galvanized rod, with connection of similar metal if required, or of other appropriate material, eight feet in length and at least 5/8 inch in diameter. Drive the rod vertically until the tip of the rod is approximately six inches below the ground surface. Use a No. 6 conductor to connect the rod and all fence elements. Connect the conductor to each fence element and the ground rod by means of electrical type clamps which will prevent corrosion.

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 07900
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparing sealant substrate surfaces.
- B. Sealant.

1.02 SUBMITTALS

- A. Submit product data sheets.
- B. Submit three (3) samples of the finish product for approval of color selection.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials to the job site in original and new unopened packages or containers bearing manufacturer's name and label.

PART 2 PRODUCTS

2.01 SEALANTS

- A. Polyurethane Sealant: Sikaflex-1a as manufactured by the Sika Corporation of Lyndhurst, New Jersey or approved equal.

Elongation Capability 700%
Service Temperature Range -40F to 150F
Shore A Hardness Range 40 + /-5

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive Work and field measurements are as shown on Drawings and recommended by the manufacturer.

3.02 PREPARATION

- A. Clean and prime surfaces in accordance with the manufacturer's instructions.
- B. Remove loose materials and foreign matter which might impair adhesion of sealant.

3.03 APPLICATION

- A. Apply sealant in accordance with manufacturer's instructions.
- B. Measure joint dimensions and size materials to achieve required width/depth ratios.
- C. Apply sealant within recommended application temperature ranges.
- D. Apply sealant free of air pockets, foreign embedded matter, ridges, and sags.

3.04 CLEANING AND REPAIRING

- A. Repair or replace defaced or disfigured finishes caused by Work of this Section.

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 contaminants, 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 contaminants. 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. 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.

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 Tnemec-Liner high solids catalyzed epoxy, 8-12 mils DFT.
2. Finish coat Series 61-5001 Tnemec-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 Cure 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 Tnemec 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 Enamel) 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 Epoxy), 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 polyurethane, 2-5 mils DFT.

C. Above Ground Fuel Storage Tanks

1. Shop Primer: One coat Series 90-97 Tnemec-Zinc zinc-rich urethane, 2.5-3.5 mils DFT.
2. Field Touch-Up: Series 90-97 Tnemec-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 coat 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 masonry 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 valve vault, fiberglass grating, and chain link fence.

END OF SECTION

SECTION 15161

SUBMERSIBLE WASTEWATER PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submersible Wastewater Pumps and Appurtenances.

1.02 RELATED WORK

- A. Electrical
- B. Pipe and Fittings
- C. Valves
- D. Concrete

1.03 SUBMITTALS

- A. Submit certified pump curves indicating pump performance characteristics with pump and system operating point.
- B. Pump manufacturer's affidavit of compliance, as well as test reports and pump performance tests for the pumping units. The tests shall be non-witness tests and be furnished prior to unit installation.
- C. Submit detailed assembly and installation drawings.
- D. Submit for each motor:
 - 1. No Load Current at rated voltage.
 - 2. Full Load Current at rated voltage.
 - 3. Power Factor at 0, 50, 75, 100, 115 Percent Full Load
 - 4. Efficiency at 50, 75, 100, 115 Percent Full Load.
 - 5. Locked-rotor Current and Amps at rated voltage.
 - 6. Breakdown Torque at rated voltage.
 - 7. Full Load RPM (Sip Frequency).
 - 8. Load WK2 capability.
 - 9. Stator Winding C Rise (Average, by Resistance).
 - 10. Outline Drawing and Weight.
 - 11. Descriptive material outlining construction features and hardware.
 - 12. Descriptive material outlining winding construction and insulation system.
- E. Submit six sets of operation, parts and maintenance manuals for each pump.

PART 2 PRODUCTS

2.01 GENERAL

- A. The pumps furnished under this section shall be the submersible, electrically driven type intended for handling raw, unscreened sewage.
- B. Each submersible pump unit shall be furnished complete with pump, motor, rail type removal system, pump base discharge elbow, and both the pump and the motor shall be furnished by the same manufacturer. A single manufacturer shall supply the above listed submersible pumps for the project.

2.02 MANUFACTURER:

A. Sewage pumps shall be manufactured by Flygt Products or Wilo-EMU.

The sewage pumps shall be equal to:

Pump Manufacturer	Pump Model	Motor No.	Installation Type
Flygt	NP3153.185	21-15-4AA-W	Submersible
Wilo-Emu	FA15.44W	T 24-6/22KEx	Submersible

2.03 PUMP CRITERIA

A. Pump shall meet the following minimum criteria:

No. of Units	3	3
Pump Model	NP3153.185	FA15.44W
Impellar Diameter (mm)	194	363
Discharge (in)	6	6
Min Hydraulic Requirements	1000 gpm @ 29' TDH Shutoff head = 58'	1,000 gpm @ 29' TDH Shutoff head = 62'
Power	230V, 3 Phase, 60Hz	230V, 3 Phase, 60Hz
Motor No.	21-15-4AA-W	T 24-6/22KEx
Maximum Motor HP	12	25
Max Number of Starts per Hour	10	10
Installation Type	Submersible	Submersible

2.04 PUMP DESIGN AND CONSTRUCTION

A. General Pumping Unit Requirements:

1. The sewage pumping units shall be vertical, non-clogging, centrifugal sewage pumps with bottom inlet and side discharge. The pumps shall be direct driven by integral squirrel cage, electric induction motors.
2. The pump(s) shall be the submersible type capable of operation fully submerged to a depth of 42 ft. normally. The pump motors shall be guaranteed to run at maximum horsepower rating continuously for 24-hour operation without damage, overheating, or overloading in the dry pit configuration without additional modifications to the motor or cooling system.
3. All major components of the pumping unit (i.e., volute casing, stator housing, sealing chamber, etc.) shall be manufactured from close-grained cast iron.
4. All nuts, bolts, washers, and other fastening devices supplied with the pumps shall be 316 stainless steel.
5. All mating surfaces requiring a watertight seal shall be machined and fitted with Buna-n O-rings.
6. Pumps shall be furnished with standard Class 125 cast iron suction and discharge flanges that are capable of flange mounting. All pumps shall be provided with suction and discharge flanges for pipe connection.
7. Solids passing capability: Minimum 3.9 inches. Solids passage shall include both the pump volute and impeller and shall be demonstrated prior to pump installation at the job site.

B Pump Volute Casings:

1. Casings shall be manufactured from close-grained cast iron, and shall be furnished with a removable clean-out port cover.
2. The clean-out port shall be large enough to permit the removal of solids equal to or greater than the solids passing capability of the impeller.
3. The interior contour of the clean-out port cover shall conform to and be flush with the interior contour of the volute casing.

C. Impellers:

1. Pump impellers shall be manufactured from A536 ductile cast iron and shall be of the solids handling vortex vane type.
2. The impeller vanes shall be smooth, finished throughout, and shall be free from sharp edges.
3. Impellers shall be statically and dynamically balanced after assembly to the rotor.
4. Impellers shall be key driven and securely held to the shaft by a streamlined impeller washer and bolt assembly specifically designed to reduce friction in the suction eye of the impeller. The arrangement shall be such that the impeller cannot unscrew or be loosened by torque from either forward or reverse rotation. Designs based on threaded connection between pump shaft and impeller are not acceptable.
5. The impeller shall be capable of passing a solid non-deformable sphere of the diameter listed in Section 2.03 Pump Criteria, paragraph A item 12. above.

D. Shafts:

1. Pump shafts shall be Series 421 stainless steel. Carbon steel shafts or shafts with sleeves of any type are not acceptable. The shaft shall be one piece construction without joints or stubs attached.
2. Multiple row lower bearings for axial thrust and a single row upper bearing for radial thrust shall support the motor/pump shafts. Thrust bearings shall be restrained from thrust in both directions and this design point shall be demonstrated in submitted pump/motor cutaway drawing showing detail parts lists of components used restrain the shaft bearings. Designs that do not protect the pump/motor from thrust in reverse directions shall not be acceptable. Reversal of thrust forces always occurs as a result of operation at certain flowrates within the normal pumping curve.
3. All shafts shall be dynamically balanced and shall be amply sized to minimize shaft deflection. Shaft overhang shall not exceed 2.5 times the shaft diameter.
4. The oil contained and circulated in the motor shall lubricate all pump/motor bearings. Grease lubricated bearings shall not be provided or acceptable.
5. Minimum shaft diameter shall be 1.96 inches at the lowest mechanical seal.

E. Sealing Devices:

1. Each pump shall be provided with an enclosed block seal consisting of a cartridge containing both the upper and lower sets of mechanical seal faces. Regular tandem mechanical seal running in an oil bath shall also be acceptable provided the designs utilize all stainless steel springs, mounting hardware, and seal face retention components. The seal face housing and spring system shall be constructed of 316 stainless steel. Both sets of faces (both upper and lower sets) shall be silicon carbide. Conventional double mechanical seals with a spring assembly between the rotating faces, requiring constant differential pressure to effect sealing and subject to penetration and opening by pumping forces shall not be considered equal to the

enclosed block seal design or the tandem seal specified. Seal designs that use springs or housing materials other than type 316 stainless steel shall not be provided or accepted. Seal face materials other than silicon carbide shall not be accepted.

2. A moisture sensor shall be furnished in the seal area of each pump. This sensor shall be wired to the Pump Control Panel and shall activate an alarm light upon seal failure. The moisture sensor probe shall be mounted on the external portion of the sealing chamber. The probe shall be capable of being tested, removed, and replaced without having to disassemble any component of the pump/motor.

F. Power and Control Cables:

1. Power and control cables shall be furnished in lengths to run contiguously from the pump to the pump control panel as shown on the Contract Drawings and as specified herein. Cables shall terminate with conductor sleeves that bundle the entire group of strands of each phase to improve termination at the pump control panel. The sleeves shall be provided to confirm that all strands of each conductor is terminated properly. Power and sensor cables, which are not provided with these sleeves, shall be rejected and shall not be acceptable on in the installation. Termination shall be coordinated with the connection to the Pump Control Panel.
2. Cables shall be of the "SO" type and shall conform to industry standards for loads, resistance under submersion against sewage, and be of stranded construction. The cables shall enter the pump through a heavy duty galvanized cast iron entry assembly which shall be provided with an external clamp assembly to protect against tension once secured providing a strain relief function as part of standard construction.
3. The cables for each pump shall pass through the galvanized cast iron strain relief component and then through a series of stainless steel disks and Buna-n grommet that is sandwiched between the disks to control compression of the grommet. These components shall work to compress the cable jacket by the inner diameter of the grommet while the outer diameter of the grommet seals against the inside surface of the cable entry chamber in the top of the motor.

D. Motors:

1. Each pump shall be furnished with a squirrel cage, induction motor enclosed in a watertight housing suitable for use and compatible with all variable frequency drive systems.
2. The motor shall be suitable for dry pit installation under full load conditions. The motors shall be capable of installation in either the wet pit or dry pit installation without adding or removing any items to the motor's interior or exterior.
3. The motors shall be oil filled and furnished with moisture resistant Class F 155°C insulation treated to be moisture resistant, NEMA B design, certified and designed for continuous duty and shall be non overloading throughout the entire pump curve range of operation without utilizing the motor service factor. The motor service factor shall be a minimum of 1.15. The motor shall be designed for operation in Class I, Group D, Division 1 locations.
4. Motors shall be capable of sustaining 10 starts per hour (unlimited starts with VFD) at a minimum ambient temperature of 40°C.
5. Motors shall be capable of uninterrupted operation with a voltage drop of 10%.
6. The power cables entering the motor housing shall connect to individual terminal pins, which separates the incoming service from the pump motor. If leakage occurs, the terminal pins short out causing the main pump circuit breaker to trip indicating that moisture has gained access to the cable entry chamber before damaging the motor.

7. The motor shall be cooled via the internally circulated oil by means of a pump/motor shaft mounted oil circulation impeller. This design shall be capable of cooling the motor under all operating conditions without the need for external jackets, air conditioning systems, or sources of clear water for cooling purposes. Jackets, external fins, or de-rating shall not be acceptable.
8. The oil circulating through the pump shall provide positive oil lubrication to all the bearings in the pump. The upper bearing shall be of the open design so that oil must flow through and around the rotating elements as it returns from the top of the motor. The lower thrust bearing shall be pressure lubricated by the shaft mounted oil impeller that discharges pressurized oil from the oil impeller through the rotating elements of the bearing and then discharges this oil to the motor heat exchanger.
9. The motor/pump oil circulation impeller shall cause the oil to move through and around the stator windings and motor rotor from which it picks up heat. This heat is then directed into the motor heat exchanger that transfers the heat to the pumped liquid. The heat exchanger shall be located below the sealing chamber. It shall be provided with a labyrinth design channel system that keeps the coolant in contact with the heat exchanger surface for the required time in order to guarantee that all the heat is removed from the coolant before it is returned to the motor. The system shall be designed such that operation at reduced speed still provides satisfactory cooling for the motor under all operating conditions.
10. Cooling systems requiring separate, clean water source or that circulates the pumped sewage through a cooling jacket will not be accepted.
11. Thermal switches shall be furnished to monitor stator temperatures. The stator shall be equipped with two (2) thermal switches, embedded in the end coils of the stator spaced directly across from each other in the stator. Thermal switches shall automatically de-energize the motor when its temperature exceeds a preset limit as recommended by the manufacturer.
12. The pump manufacturer's nameplates shall be engraved or stamped on stainless steel and fastened to the motor casing with stainless steel screws or drive pins.

H. Suction Support Base Elbow

1. The suction support base elbow shall be provided to support the submersible pump in the installation. The suction elbow shall be capable of supporting the weight of the submersible pump as well as provide a secure and vibration free mount to allow the pump to operate at all points on the pump curve free from vibration.

I. Warranty

1. The pumps, motors, and materials will be covered by a five-(5) year warranty that shall comprise the following terms: The initial year from substantial completion of the equipment shall be covered 100 % for parts, labor, and materials. The following years 2 through 5 shall be covered 50 % for parts, labor, and materials. This warranty shall not be limited by hours of running time, operation from VFD, or requirements by the Owner to do any maintenance on the pumps.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install pumping units at locations shown on the Drawings. Installation shall conform to details shown on the Drawings and manufacturer's recommendations.

3.02 MANUFACTURER'S FIELD SERVICES

- A. Provide the services of the pumping unit manufacturer's authorized field representative to verify proper installation prior to start-up and to check initial operation. Provide instruction to Owner on proper operation and maintenance of the pumps.

3.03 FIELD QUALITY CONTROL

A. Field Testing:

1. After the installation of the Pumps, controls and all appurtenances, and when construction of other units of the pump installation will permit, each complete pump unit will be subject to field tests as specified herein under actual operating conditions. Testing shall validate pump operating conditions specified herein.
2. The field tests shall be made by the Contractor under the direct supervision of a qualified factory trained engineer, and in the presence of the Engineer. 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 required for the field tests.
3. The field tests shall check each pump for the following:
 - Has not been damaged by transportation or installation.
 - Has been properly installed.
 - Have no mechanical defects.
 - Is in proper alignment.
 - Has been properly connected.
 - Is free of overheating of any parts.
 - Is free of all-objectionable vibration and noise.
 - Is free of overloading of any parts.

B. Test Reports

1. Submit certified copies of manufacturer's field start-up report.

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 civil site plans and 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.
- D. Make all field connections to RTU panels.

1.03 GENERAL INFORMATION

- A. Each bidder or his authorized representatives shall, before preparing his proposal, visit all areas of the sites 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 sites 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 UTILITY COORDINATION

- A. The Contractor shall coordinate with local representatives of the power utility to ensure the proper installation of these utilities at the project sites. Utility installation(s) shall be in accordance with the requirements of the Contract Documents and meet all requirements of the respective utility.

1.06 TEMPORARY ELECTRICAL FACILITIES

- B. 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 completed. 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.
- C. 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.

1.07 INTERPRETATION OF DRAWINGS

- A. The Drawings are not intended to show exact locations of conduit runs.
- B. Unless otherwise approved by the Engineer conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.
- C. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation.
- D. 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.
- E. 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.

- F. 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.
- G All connections to equipment shall be made as shown, specified, and directed and in accordance with the approved shop drawings.
- H. All cutting and patching necessary throughout the existing site shall be done in a thoroughly workmanlike manner.

1.08 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.

1.09 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.

1.10 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.

1.11 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.

1.12 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.

1.13 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.

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. Schedule 40 PVC conduit shall be used underground, unless otherwise noted. Transitions to exposed, outdoor locations shall be made using Schedule 80 PVC conduit starting with the last 90 degree elbow.
- B. Schedule 80 PVC conduit shall be used in exposed, outdoor locations except where specified otherwise.
- C. PVC coated RGS conduit shall be used as raceways for shielded wiring.
- D. All conduit of a given type shall be the product of one manufacturer.

PART 2 - PRODUCTS

2.01 RIGID CONDUIT

- A. 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.
- 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.

2.02 BOXES AND FITTINGS

- A. Terminal boxes, junction boxes, pull boxes, etc., shall be schedule 80 PVC unless otherwise shown on the Drawings. Covers shall be gasketed and fastened with stainless steel screws. Boxes shall be as manufactured by Hoffman Engineering Company or approved equal.
- B. Conduit hubs shall be as manufactured by Meyers Electric Products, Inc., Raco Division, Appleton Electric Company, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. No conduit smaller than 3/4 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.

- 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.
- 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.
- J. All earth, sod, etc., moved during the installation of underground conduit shall be replaced by the contractor to its original state.
- K. Conduits terminating in gasketed enclosures shall be terminated with conduit hubs.
- L. The ends of all conduits terminating in panels and cabinets shall be filled with silicone gel. Filling shall be done after the cable has been pulled in order to prevent moisture 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 THHN/THWN No. 14 AWG, stranded.
- C. 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 16452

GROUNDING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish and install a complete grounding system in strict accordance with Article 250 of the National Electric Code and as hereinafter specified and shown on the Drawings.

PART 2 - PRODUCTS

2.01 GROUND RODS

- A. Ground rods shall be copper clad steel 5/8 inch diameter x 20 foot minimum length. Ground rods shall be Copperweld or be an approved equal product.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Contractor shall not allow any grounding connections to be painted. If the connections are painted, they shall be disassembled and remade with new fittings.
- B. Grounding electrodes shall be driven as required. Where rock is encountered, grounding plates may be used in lieu of grounding rods.
- C. All equipment enclosures, motor frames, conduits systems, exposed structural steel, and similar items shall be grounded.
- D. Exposed connections shall be made by means of approved grounding clamps. Exposed connections between different metals shall be sealed with No-Oxide Paint Grade A or approved equal. All buried connections shall be made by welding process equal to Cadweld.
- E. All grounding conductors shall be laid slack and where exposed to mechanical injury, shall be protected by pipes or other substantial guards. If guards are iron pipe or other magnetic material, conductors shall be electrically connected to both ends of the guard.
- F. The Contractor shall exercise care to insure good ground continuity, in particular between the conduit system and equipment frames and enclosures. Where necessary, jumper wires shall be installed.

3.02 TESTS

- A. The Contractor shall test the ground resistance of the system. Testing shall not be performed within 48 hours of rainfall. All test equipment shall be provided by the Contractor and approved by the Engineer. Dry season resistance of the system shall not exceed 5 ohms. Submit test results to the Engineer for approval. In the event that the specified resistance cannot be achieved through the grounding as shown, provide additional grounding as directed by the Engineer.
- B. All grounding system continuity shall be checked with a low range ohmmeter.

END OF SECTION

SECTION 16621

DIESEL-ELECTRIC STANDBY POWER SYSTEM

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Provide, install, and acceptance test a complete and operable standby electric generating system, including all devices and equipment specified herein, as shown on the drawings, and as required for the service. Materials and equipment shall be new, and delivered to the job site factory tested and ready for installation.
- B. Generator set ratings shall be 75kW @ 0.8 p.f., 240/120V, 3 phase, four wire, delta connected. Output capacity shall be maintained up to 500 feet elevation and at ambient temperatures between 40 and 120 degrees F.
- C. The system shall include the following:
 - 1. 1 engine-generator set, with accessories
 - 2. Starting batteries
 - 3. Battery Charger, 10 amp rating
 - 4. Other control devices, accessories, tests, documents, and services as needed to meet specifications.
- D. Furnish the following items for the generator set:
 - 1. Exhaust silencer, hospital grade, flanges, wall thimble, and flexible exhaust pipe section, sized as required for the engine and installation. All exhaust materials shall be 316 stainless steel.
 - 2. Sound attenuated, weatherproof enclosure as specified herein.
 - 3. Sub-base fuel tank with automatic controls as specified herein.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Equipment and equipment installation shall meet all applicable state and local codes. Equipment supplied shall meet or exceed requirements of the following, as applicable:

NFPA 70 National Electrical Code

NFPA 110 Emergency and Standby Power Systems

NFPA 37 Installation of Stationary Engines

- B. It is intended that all products specified herein be of standard ratings, therefore the kW and kVA ratings, ampere ratings, withstand and closing ratings, etc., shall be the manufacturer's next larger size or rating when the specifications cannot be exactly met.

1.03 SUBMITTALS

- A. Shop Drawings: For all equipment specified, provide the following:

1. Specification and data sheets showing ratings and derating schedules, operating performance, weights, fuel consumption rates, ventilation and combustion air requirements, exhaust flow data, cooling system data, and engine and generator data, including generator breaker information.
2. Manufacturer's certification of generator set prototype testing. Transfer switch withstand and closing ratings with overcurrent device specifications.
3. Manufacturer's warranty documents and statements accepting warranty responsibility as specified herein for all equipment.
4. Itemized list of all exceptions taken to this specification.
5. Plan and elevation views with certified overall and interconnection point dimensions.
6. Electrical interconnection wiring diagrams showing all external connections required; with terminal and destination markings for all equipment, controls, and devices included in the system.
7. Manufacturer's installation, operating, and maintenance instructions.
8. All accessory equipment information.

1.04 APPROVAL

- A. Supplier: All standby electrical generating system equipment shall be provided and tested by a single supplier who is an authorized representative of the generator set engine manufacturer. This representative shall maintain parts and service facilities, including factory trained mechanics and 24 hour service availability, for the unit supplied within 100 miles of the project site.

Approved Engine Manufacturers/System Suppliers:

1. Caterpillar by Pantropic Power Products, Inc.
2. Cummins/Onan by Cummins Southeastern Power, Inc. or OK Generators
3. Detroit Diesel by Florida Detroit Diesel-Allison.

No substitute is permitted.

- B. Warranty: The complete electrical power system (generator set, controls, and associated switches, switchgear and accessories), as provided by the single source supplier, shall be warranted by the manufacturer against defects in materials and workmanship for a period of five years or 1500 hours, whichever occurs first from the date of system start-up. Coverage shall include parts, labor, travel expenses, and labor to remove/reinstall the equipment, per the manufacturer's standard published limited warranty. There shall be no deductibles applied to the warranty.

PART 2 - PRODUCTS

2.01 DIESEL ENGINE-GENERATOR SET

- A. Performance: The generator set manufacturer shall verify the diesel engine as capable of driving the generator with all accessories in place and operating at the generator set kW rating after derating for the range of temperatures expected in service and the altitude of the installation. The manufacturer shall provide documentation demonstrating satisfactory prototype test results for the model specified and production test results for equipment supplied for this project. Generator sets that have not been factory tested at 0.8 PF will not be acceptable. Voltage regulation shall be +/- 0.5 percent of rated voltage for any constant load between no load and rated load. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Total Harmonic Distortion; the sum of AC voltage waveform harmonics, from no load to full linear load, shall not exceed 5% of rated voltage (L-N, L-L, L-L-L) and no single harmonic shall exceed 3% of rated voltage. Telephone Influence Factor; TIF shall be less than 50 per NEMA MG1-22.43. The diesel engine-generator set shall be capable of single step load pick up of 100% nameplate kW and power factor, less applicable derating factors, with the engine-generator set at operating temperature.
- B. After an initial instantaneous voltage dip not to exceed 20 percent, the generator set shall be capable of sustaining a minimum of 90% of rated no load voltage with the specified kVA load at near zero power factor applied to the generator set. Maximum frequency dip shall not exceed 10 percent. Maximum recovery time shall be three seconds.
- C. AC Generator: AC generator, exciter and voltage regulator shall be designed and manufactured by the engine-generator set manufacturer as a complete generator system. The AC generator shall be; synchronous, four pole, revolving field, drip-proof construction, single pre-lubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc(s). The stator shall have skewed laminations of insulated electrical grade steel, two-thirds pitch windings. The rotor shall have amortisseur (damper) windings. The rotor shall be dynamically balanced. The exciter shall be brushless, three phase, with full wave silicon diodes mounted on the rotating shaft and a surge suppressor connected in parallel with the field winding. All insulation system components shall meet NEMA MG1 standard temperature limits for Class H insulation system. Actual temperature rise measured by resistance method at full load shall not exceed 105 degrees Centigrade. The generator shall be broad range, 12 lead reconnectable. The generator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage within the broad range. The main

generator and exciter insulation systems must be suitably impregnated for operation in severe environments for resistance to sand, salt, and sea spray.

- D. Provide a 120V, single phase, 60 Hz, 200 watt minimum space heater for the generator windings. Provide the appropriate control such that the heater is on when the generator set is off and off when the generator set is on.
- E. A permanent magnet generator (PMG) shall provide excitation power to the automatic voltage regulator for immunity from voltage distortion caused by non-linear SCR controlled loads on the generator. The PMG shall sustain main field excitation power for optimum motor starting and to sustain short circuit current at approximately 300% of rated current for approximately 10 seconds. The automatic voltage regulator shall be temperature compensated, solid-state design. The voltage regulator shall be equipped with three-phase RMS sensing. The regulator shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. Overvoltage protection shall sense the AC generator output voltage and in the event of regulator failure or loss of reference, shut down regulator output on a sustained overvoltage of one (1) second duration. Overexcitation protection shall sense regulator output and shut down regulator output if overloads exceed ten (10) seconds duration. Both overvoltage and overexcitation protection shutdowns shall be latched, requiring the AC generator to be stopped for reset. The regulator shall include an under frequency rolloff torque-matching characteristic, which shall reduce output voltage in proportion to frequency below a threshold of 58-59 HZ. The torque-matching characteristic shall include differential rate of frequency change compensation to use maximum available engine torque and provide optimal transient load response. Regulators which use a fixed volts per hertz characteristic are also acceptable provided that the specified response characteristics are met.
- F. Engine-Generator Set Control: The control shall have a 3 position selector switch with automatic remote start capability. A panel mounted switch shall stop the engine in the STOP position, start and run the engine in the RUN position, and allow the engine to start and run by closing a remote contact, and stop by opening the remote contact when in the REMOTE position. The control shall include a cycle cranking function. The cranking cycle, nonadjustable, shall consist of an automatic crank period of approximately 15 seconds duration followed by a rest period of approximately 15 seconds duration. Cranking shall cease upon engine starting and running. Two separate means of cranking termination shall be provided, one completely redundant to the other with no common components. Failure to start after three cranking attempts (75 seconds) shall shut down and lockout the engine, and visually indicate an overcrank shutdown on the panel. The control shall shut down and lock out the engine upon: failing to start after the specified time (overcrank), overspeed, low lubricating oil pressure, low oil level, high lube oil temperature, high engine temperature, low coolant level, low fuel level, generator breaker trip, or operation of a remote manual stop station. The control shall provide an engine monitor. A panel mounted switch shall reset the engine monitor and test all the lamps. Lamp indications on the control panel shall include:
 - 1. Overcrank shutdown - red
 - 2. Overspeed shutdown - red
 - 3. Low oil pressure shutdown - red
 - 4. Low oil level shutdown - red
 - 5. High oil temperature shutdown - red
 - 6. High engine temperature shutdown - red

7. Low coolant level shutdown - red
8. Generator breaker trip shutdown - red
9. High engine temperature prealarm - yellow
10. Low engine oil pressure prealarm - yellow
11. Low coolant temperature - yellow
12. Low fuel - yellow
13. Fuel leak - red
14. Run - green
15. Not in automatic start - flashing red
16. Auxiliary (2 each) - red

The engine-generator set starting battery(ies) shall power the monitor. The control shall include surge suppression for protection of solid state components. Operation of shut down circuits shall be independent of indication and prealarm circuits. Individual relay signals shall be provided for each indication for external circuit connections (not to exceed ½ amp draw). A common alarm contact for external connection shall be provided. Provide output status contacts (N.O.) for remote use for the following: Low fuel level, fuel leak, generator run (One (1) N.O. & One (1) N.C.).

- G. A NEMA 12 enclosed control panel shall be mounted on the generator set with vibration isolators. A front control panel illumination lamp with ON/OFF switch shall be provided. Control panel mounted indicating meters and devices shall include:

1. Engine Oil Pressure Gauge
2. Coolant Temperature Gauge
3. DC Voltmeter
4. Running Time Meter (hours)
5. Voltage adjusting rheostat, locking screwdriver type, to adjust voltage +/- 5% from rated value
6. Analog AC Voltmeter, dual range, 90 degree scale, 2% accuracy
7. Analog AC Ammeter, dual range, 90 degree scale, 2% accuracy
8. Analog Frequency/RPM meter, 45-65 Hz, 1350-1950 RPM, 90 degree scale, +/- 0.6 Hz accuracy
9. Seven position phase selector switch with OFF position to allow meter display of current and voltage in each generator phase.

When supplied with reconnectable generators, the meter panel shall be reconnectable for the voltage specified.

- H. Engine: The engine shall be 4 cycle, 1800 rpm, diesel fueled, direct injection, with forged steel crankshaft and connecting rods. An electronic governor; consisting of a magnetic pickup speed sensor, adjustable electronic control, and an electric actuator mounted integrally with the fuel pump, shall provide automatic engine-generator set frequency regulation adjustable from isochronous to 5% droop. The governor shall be suitable for paralleling future generator sets with the addition of load sharing controls. The engine shall be cooled by a unit-mounted closed loop radiator system including belt-driven pusher fan, coolant pump and thermostat temperature control. The cooling system shall be rated for full rated load operation in 120 degrees F ambient condition with the ambient temperature as measured at the generator air inlet. The cooling

capability of the generator set shall be demonstrated by prototype tests on a representative generator set model. These tests will be conducted by the generator set manufacturer; calculated data from the radiator manufacturer only is not sufficient. Radiators shall be provided with a duct adaptor flange permitting the attachment of an air discharge duct to direct the radiator air outside according to the manufacturer's instructions. The cooling system shall be filled with 50/50 ethylene glycol/water mixture by the equipment supplier. Rotating parts shall be guarded against accidental contact.

I. Engine Accessory Equipment: The engine-generator set shall include the engine accessories as follows:

1. An electric starter(s) capable of three complete cranking cycles without overheating, before overcrank shutdown (75 seconds).
2. Positive displacement, mechanical, full pressure, lubrication oil pump.
3. Full flow lubrication oil filters with replaceable spin-on canister elements and dipstick oil level indicator.
4. An engine driven, mechanical, positive displacement fuel pump.
5. Fuel filter with replaceable spin-on canister element.
6. Replaceable dry element air cleaner with restriction indicator.
7. Flexible supply and return fuel lines.

J. Base: The engine-generator set shall be mounted on a heavy-duty steel base to maintain proper alignment between components. The engine-generator set shall incorporate a battery tray with hold down clamps within the base rails. Provisions for stub up of electrical and fuel connections shall be within the footprint of the generator set base rails.

K. Generator Set Auxiliary Equipment:

1. Engine mounted, thermostatically controlled, water jacket heater(s) for the engine. The heater(s) shall be sized as recommended by the equipment supplier. Heater voltage shall be 120V, single phase.
2. Generator main circuit breaker, set-mounted and wired, UL listed, rated 250A. Field circuit breakers shall not be acceptable for generator overcurrent protection. The circuit breaker shall include provisions for shunt trip. Provide auxiliary contact for trip status reporting (common w/engine shutdown). Tripping of the generator circuit breaker while under load shall initiate engine shutdown.
3. Vibration isolators, spring isolators type, quantity as recommended by the generator set manufacturer.

4. Battery Charger: A 10 amp voltage regulated battery charger shall be provided for the engine-generator set. Input AC voltage and DC output voltage shall be as required. Chargers shall be equipped with float, taper and equalize charge settings. Operational monitors shall provide visual output along with individual form C contacts rated at 4 amps, 120 VAC, 30 VDC for remote indication of:
 - a. Loss of AC power - red light
 - b. Low battery voltage - red light
 - c. High battery voltage - red light
5. Starting and Control Batteries: Starting batteries, lead acid type, 12 volt DC, sized as recommended by the generator set manufacturer, shall be supplied for the generator set with battery cables and connectors.
6. Remote annunciator panel per manufacturer's standard equipment.
- L. Sound Attenuated Weatherproof Enclosure: Provide a factory installed weatherproof enclosure (Level 1 sound attenuation) sized to house the engine-generator set, exhaust silencer, batteries and charger. The enclosure shall be constructed of aluminum, with stainless steel hardware. Enclosure shall be painted in color selected by Owner. Enclosure doors shall be padlockable and conveniently placed for ease of operation and maintenance.
- M. Sub-base Fuel Tank: Provide an integrally mounted, dual wall steel, diesel fuel tank, 500 gallon capacity. The tank shall be U.L. listed with both inner and outer tank emergency vents per NFPA 30. The sub-base fuel tank shall be as manufactured by the Tramont Corporation, Milwaukee, Wisconsin, with the following system accessories:
 1. Dual high/low fuel level switch (provide high level audible alarm on gen control panel)
 2. Leak detection switch.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction. Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.
- B. Provide branch circuits as required, from the panelboard for the generator set auxiliaries.
- C. Provide and install all necessary control wiring between system components whether or not shown on the drawings.

3.02 TESTING

- A. To provide proven reliability of the system, three series of tests shall be performed: Prototype

Model Tests, Production Model Tests, and Field Tests. The manufacturer shall provide documentation demonstrating satisfactory prototype and production test results. Generator sets that have not been prototype tested and factory tested at 0.8 PF will not be acceptable.

- B. Generator Set Factory Prototype Tests and Evaluation: These tests and evaluations must have been performed on a prototype generator set representative of the Model specified. A summary of the generator set testing results shall be submitted for review. The manufacturer's standard series of component development tests on the generator system, engine, and other major components shall also be performed and available for review, but shall not be acceptable as a substitute for prototype testing on the complete representative generator set prototype.
1. Torsiograph Analysis and Test: The manufacturer of the generator set shall verify that the engine-generator set, as configured, is free from harmful torsional stresses. The analysis shall include correlation of empirical data from tests on a representative prototype. The empirical data must include spectrum analysis of the torsional transducer output within the operating speed range of the engine-generator set. Calculations based on engine and generator separately are not acceptable.
 2. Temperature Rise Test: Complete thermal evaluation of a prototype generator rotor and stator must include actual measurement of internal generator and exciter temperatures by embedded detector method, and measurement of average temperature rise by resistance method. No position measured any place in the windings may exceed the temperature rise limits of NEMA for the particular type of insulation system used. Resistance method temperature rise data shall be confirmed by a full load test on the generator set prototype to include conducted and radiated heat from the engine.
 3. Short Circuit Test: A test on a prototype generator set shall have demonstrated that the generator set is designed to withstand the mechanical forces associated with a short circuit condition. With the generator set operating at rated load and speed, the generator terminals must be short circuited on all three phases for a duration of 20 seconds. At the conclusion of this test, the generator set must be capable of full load operation.
 4. Endurance Run Test: A minimum of five hundred (500) continuous hours of endurance testing with a representative generator set prototype operating as defined by the manufacturer's standby rating shall have been performed. Endurance testing shall be used to verify structural soundness and durability.
 5. Maximum Power Test: With the prototype generator set at normal operating temperature and with all power consuming auxiliaries in place, the maximum power available at rated speed shall be determined with the governor set at its fuel stop. The generator set shall maintain this power for a minimum of two minutes.
 6. Linear Vibration Test: A test for in-line motion of components occurring along a repeatable path shall meet the manufacturer's acceptance criteria.
 7. Cooling System Test: A cooling system test shall demonstrate the ability of the generator set cooling system to maintain normal operating temperature while operating at full rated load and power factor at the highest ambient temperature of the system rating. Cooling

air requirements, radiator airflow and maximum allowable restriction at radiator discharge, shall be verified by this test.

8. Maximum Motor Starting kVA: Motor starting kVA shall be determined by test, based on a sustained RMS recovery voltage of at least 90% of no load voltage with the specified load kVA at near zero power factor applied to the generator set.
9. Transient Response, Steady-state Speed Control, and Voltage Regulation: Prototype generator set tests shall demonstrate consistent performance as follows; stable voltage and frequency at all loads from no load to full rated load, consistent frequency bandwidth with steady- state load, maximum voltage and frequency dip on load acceptance and rejection, and restoration to steady state after sudden load changes. Transient response is a complete generator set (engine, generator, exciter, and regulator) performance criteria and cannot be established based on generator data alone.

3.03 FACTORY TESTS

- A. Generator set factory production tests: on the equipment to be shipped, shall be performed at rated load and 0.8 PF. These tests shall include run at full load, maximum power, voltage regulation, transient and steady-state governing, single step load pickup, and safety shutdowns. Provide a factory certified test record of the production testing.

3.04 ON-SITE ACCEPTANCE TEST

- A. The complete installation shall be tested for compliance with the specification following completion of all site work. Testing shall be conducted by representatives of the manufacturer, with required fuel supplied by Contractor. The Engineer shall be notified in advance and shall have the option to witness the tests. Installation acceptance tests to be conducted on-site shall include a "cold start" test, a two hour full load test, and a one-step rated load pickup test in accordance with NFPA 110.
- B. Provide a resistive load bank and make temporary connections for full load test. Load bank shall be capable of definite and precise incremental loading and shall not be dependent on generator control instrumentation to read amperage and voltage of each phase. Salt water brine tanks or those load banks requiring water as a source for cooling are not acceptable for this purpose and are disallowed and shall not be utilized for this test.

3.05 SCHEDULED OIL SAMPLING

- A. In order to forecast and minimize engine failure, the supplier of the equipment must provide a yearly (every twelve (12) months) oil sampling analysis throughout the warranty period. This scheduled oil sampling shall not be of the atomic absorption spectrophotometry method as opposed to the spectrographic analysis method and shall be accurate to within a fraction of one (1) part per million for the following elements:
 1. Iron
 2. Copper
 3. Chromium

4. Aluminum
5. Silicon

In addition, the sample shall be tested for the presence of water, fuel dilution, and anti-freeze.

B. All equipment needed to take oil samples shall be provided in a kit at the time of acceptance and shall include the following:

1. Sample gun kit (1)
2. Bottles (8)
3. Mailers (8)
4. Written instructions (1)

C. Immediate notification shall be provided to the OWNER when analysis results show any critical reading. If readings are normal, a report showing that the equipment is operating within established requirements shall be provided.

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 DISCONNECT SWITCHES

- A. Fusible and non-fusible disconnect switches shall be heavy-duty, quick-make, quick-break, visible blades, 600 volt, 3-pole with full cover interlock. All current carrying parts shall be copper. Enclosure Type shall be NEMA-4X, stainless steel, with stainless steel mounting hardware except as shown on the drawings. Disconnect switches shall be horsepower rated as manufactured by the Square-D Company, Class 3110, Type H, or approved equal.
- B. Surge arresters shall be installed on the main disconnect switch. Provide protection for each ungrounded conductor as required. These shall be connected to the line side of the protected equipment. Install a current limiting fuse in series with each pole of the arrester connection as recommended by the Manufacturer. All transient protection devices, including fuses, shall be installed within the protected equipment enclosures wherever possible. Surge arresters shall be as manufactured by the General Electric Company, Tranquell Series, Model 9L15 or approved equal.

-END OF SECTION-

SECTION 329200 - LAWNS AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sodding.

1.2 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.
- E. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product certificates.
- C. Planting Schedule: Indicating anticipated planting dates for each type of planting.

1.4 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
- B. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory.
1. Report suitability of topsoil for lawn growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Sod: Harvest, deliver, store, and handle sod according to requirements in TPI's "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

1.6 MAINTENANCE SERVICE

- A. Initial Lawn Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
1. Sodded Lawns: 30 Thirty days from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TURFGRASS SOD

- A. Turfgrass Sod: Certified Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with TPI's "Specifications for Turfgrass Sod Materials" in its "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
- B. Turfgrass Species: As specified on plans.

2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 10 percent organic material content; free of stones 1/2 inch or larger in any dimension and other extraneous materials harmful to plant growth.
1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient.
 2. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

3. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources.

2.3 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 100 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 1. Composition: 1 lb/1000 sq. ft. 6% of actual nitrogen, 2 percent phosphorous, and 0 percent potassium, by weight].

PART 3 - EXECUTION

3.1 LAWN PREPARATION

- A. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1/2 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 1. Apply 6-2-0 fertilizer directly to subgrade before loosening.
 2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
 - a. Reduce elevation of planting soil to allow for soil thickness of sod.
- B. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to a homogeneous mixture of fine texture.
 - a. Apply 6-2-0 "milorganite" fertilizer directly to surface soil before loosening.
 3. Remove stones larger than 1/2 inch in any dimension and sticks, roots, trash, and other extraneous matter.
 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- D. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- E. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.2 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
 - 1. Lay sod across angle of slopes exceeding 1:3.
 - 2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.3 LAWN MAINTENANCE

- A. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.
- B. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings.

3.4 SATISFACTORY LAWNS

- A. Satisfactory Sodded Lawn: At end of maintenance period, a healthy, well-rooted, even-colored, viable lawn has been established, free of weeds, open joints, bare areas, and surface irregularities.

City of Lake Worth
Wastewater Pump Station #4
Landscape

February 2, 2016

- B. Use specified materials to reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

END OF SECTION 329200

SECTION 329300 - EXTERIOR PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

- Trees
- Shrubs
- Ground cover
- Plants

1.2 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- E. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.
- F. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product certificates.
- C. Planting Schedule: Indicating anticipated planting dates for exterior plants.
- D. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a calendar year.

1.4 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
- B. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory prior to application of any soil amendments.
- C. Report suitability of topsoil for plant growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
- D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock," and Florida Grades and Standards for Nursery Plants." All plants shall meet or exceed Florida Grade #1.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.
- B. Handle planting stock by root ball.
- C. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.

1.6 WARRANTY

- A. Warrant material for a period of one (1) year, from the date of final acceptance against death and unhealthy condition, except as may result from neglect by owner, damage by others unusual phenomena beyond contractor's control. Replacements shall be made with compatible size and quality of material at a time requested or acceptable by the owner or Landscape Architect. Plant material rejected during the course of construction shall be removed within five (5) working days and replaced before the final inspection for completion will be scheduled. Warranty on replacement of plants shall be 90 days from the date of final acceptance of the replacements. Any damage to sodded or seeded areas during replacement of plant material shall be corrected by the Landscape Contractor.

1.7 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in PART 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.
 - 2. Maintenance Period for Trees and Shrubs: Until Substantial Completion.
 - 3. Maintenance Period for Ground Covers and Plants: Until Substantial Completion.

1.8 QUANTITIES, LOCATION AND SUBSTITUTIONS

- A. The quantities of plant materials shown on plans shall take precedence over the plant quantities on the plant list. The Landscape Architect reserves the right to adjust the number and locations of the designated types and species of plants to be used at any other locations shown. The owner shall receive a credit or debit for the unit price of the plant material. No substitution of plant material types, specifications or sizes will be permitted without written authorization from the Landscape Architect. The owner and/or Landscape Architect reserves the right to not accept plant material that does not, in the opinion of the owner and/or Landscape Architect, meet the specifications herein.

PART 2 - PRODUCTS

2.1 TREE AND SHRUB MATERIAL

- A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1 and Florida Grades and Standards #1 minimum standard with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- C. Provide trees as specified on Drawings.
- D. Shrub sizes indicated on Drawings are sizes after pruning.

2.2 GROUND COVER PLANTS

- A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1 and Florida Grades and Standards #1 minimum standard.

2.3 PLANTS

- A. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.
- B. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed, complying with requirements in ANSI Z60.1 and Florida Grades and Standards #1 minimum standard.

2.4 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 10 percent organic material content; free of stones 1/2 inch or larger in any dimension and other extraneous materials harmful to plant growth.
- B. Topsoil shall be friable fertile soil with representative characteristics of area soils. It should be free of heavy clay, silt, stone, excess lime, shell rock, plant roots, debris or other foreign matter. It shall not contain noxious plant growth (such as Bermuda, Torpedo or Nut grass). It shall test between the PH range of 5.0 to 7.0 unless otherwise specified and contain no toxic residue or substances that would endanger plant growth. If topsoil is not available on site, it shall be imported from local sources with similar soil characteristics to that found at project site. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth not less than 4 inches.

2.5 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 - B. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
 - C. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.
- D. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.
- E. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- F. Aluminum Sulfate: Commercial grade, unadulterated.
- G. Perlite: Horticultural perlite, soil amendment grade.

- H. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.
- I. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.6 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through **1/2-inch** sieve; soluble salt content of 5 decisiemens/m.
- B. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.
- C. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

2.7 FERTILIZER

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1-4 percent nitrogen and 10-20 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
- D. Composition: [1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight]
- E. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
- F. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.8 MULCHES

- A. Organic Mulch: Non-colored Shredded hardwood and Pine straw.
- B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve.
- C. Mineral Mulch: Rounded riverbed gravel or smooth-faced stone, Crushed stone or gravel, Marble chips, Granite chips.

1. Size Range: 1-1/2 inches (38 mm) maximum, 3/4 inch (19 mm) minimum or 3/4 inch (19 mm) maximum, 1/4 inch (6 mm) minimum.
2. Color: As specified on the Drawings.

2.9 WEED-CONTROL BARRIERS

- A. Nonwoven Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101 g/sq. m) minimum.
- B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd. (162 g/sq. m).

2.10 PLANTING SOIL MIX

Planting Soil Mix:

- A. Backfill Mixture: 1/3 Sand, 1/3 Topsoil, 1/3 Peat Humus
- B. Slow release fertilizer for newly installed material at a rate of:
 - 5.00 LBS. or 14.5 cups / each palm
 - 3.00 LBS. or 8.70 cups / each 12-16' material
 - 2.00 LBS. or 5.80 cups / each 8-12' material
 - 0.69 LBS. or 2.00 cups / each 6-8' material
 - 0.19 LBS. or ½ cup / each 3 Gal. material
 - 0.10 LBS. or ¼ cup / each 1 Gal. material
- C. Turf Areas: See Specifications for Lawn and Grasses.
- D. Super absorbent polymer: "Horta-sorb" or approved equal as manufactured by Horticultural Alliance, Inc. 1-800-628-0607.
 1. Application: Mix a polymer evenly with the back fill in the upper 2/3 of planting hole depth leaving untreated the top 1 inch of soil.
 2. Rate: Mix at the rate of 1 oz. per inch caliper of tree or foot diameter of root ball unless otherwise recommended by manufacturer.

PART 3 - EXECUTION

3.1 PLANTING BED ESTABLISHMENT

- A. Preparation: All planting areas to be clear and clean of construction debris and compacted road base for a depth of 30 inches.
- B. Loosen subgrade of planting beds to a minimum depth of 4 inches (100 mm). Remove stones larger than 1/2 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply fertilizer directly to subgrade before loosening.
 - 2. Thoroughly blend planting soil mix off-site before spreading; or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
 - 3. Spread planting soil mix to a depth of 4 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
- C. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.2 TREES AND SHRUBS

- A. Preparation: All planting areas to be clear and clean of construction debris and compacted road base for a depth of 30 inches.
- B. Utilities: Above and below ground utilities shall be verified and located by the Landscape Contractor prior to commencing work in the project area. If utility plans are available, the Contractor shall examine them and bring any and all conflicts to the attention of the Owner and/or Landscape Architect.
 - 1. When working in an area where known utilities exist, utility locations may need to be staked by a surveyor or the utility companies. The Contractor has the option to contact U.N.C.L.E. at 1-800-432-4770 to schedule location of the utilities which subscribe to their service.
- D. Weeds: Prior to the installation of plants, the site shall be free of weeds, grass, sod, debris, rocks or other material making the site unplatable. For final acceptance all planted areas shall be weed free.
- E. Grading: The Landscape Contractor shall coordinate the installation and grading of topsoil, if necessary, with the General Contractor, to insure the site is at finish grade prior to installing plants.
- F. Planting Trees & Shrubs:

1. Layout plants according to Landscape Drawings. If a conflict arises as to the location, spacing or other conflict, contact the Landscape Architect immediately.
2. Excavate pit to two and one-half (2 ½) times the diameter of tree ball and not less than 6" deeper. Compact a layer of backfill mixture in pit to locate collar of plant properly in a slightly dished finish grade. Backfill around ball with backfill mixture compacted to eliminate voids and air pockets, watering thoroughly as layers are placed. Build 3 inch high berm of soil beyond edge of excavation. Apply fertilizer as specified and then mulch with the type and thickness specified on plant list.
3. Guy and stake all trees per details on Landscape Drawings.

3.3 TREE AND SHRUB PRUNING

- A. Pruning shall be done on site after planting for damaged limbs or as directed to improve overall plant appearance. Do not remove more than 15% of branches. Pruning methods shall follow standard horticultural practices using appropriate tools. Lopping, shearing or topping of plant material will be grounds for rejection. Damaged, scarred, frayed, split or skinned branches, limbs or roots to be pruned back to live wood. The central leader or bud shall be left intact unless severely damaged.

3.4 GROUNDCOVER AND PLANT PLANTING

- B. Loosen subgrade to depth of 4 inches in areas where topsoil has been stripped, and spread backfill mixture.
- C. Space plants as otherwise indicated. Dig holes large enough to allow for spreading of roots. Compact backfill to eliminate voids, and leave grade slightly dished at each plant. Water thoroughly. Apply fertilizer as specified on plant list, lifting plant foliage above mulch. Mulch shall be spread before planting plants in pots less than 1 gallon size (4 inch, liners, etc.).
- D. Prune shrubs to remove damaged branches, improve natural shape, thin out structure and remove not more than 15% of branches.

3.5 PLANTING BED MULCHING

- A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 6 inches. Tape or pin seams as recommended by manufacturer.
- B. Mulch backfilled surfaces of planting beds and other areas indicated on plans.
 1. Shredded Wood Mulch: Apply 3-inch average thickness of mulch and finish level with adjacent finish grades. Do not place mulch against plant stems or trunks of trees.

2. Pine Straw Mulch: Apply 3-inch average thickness of loosen straw and finish level with adjacent finish grades. Do not place mulch against plant stems or trunks of trees.

3.6 PLANT MAINTENANCE

- A. Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
- B. Groundcover and Plant Maintenance: Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.
- C. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

END OF SECTION 329300

APPENDIX A

PBCHD Permit File No. 138272-202-DWC

Mission:

To protect, promote & improve the health of all people in Florida through integrated state, county & community efforts.



Rick Scott
Governor

John H. Armstrong, MD, FACS
State Surgeon General & Secretary

Vision: To be the Healthiest State in the Nation

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT/PERMIT ISSUANCE**PERMITTEE:**

Monica Shaner, P.E.
Assistant Water Utilities Director
City of Lake worth, Utilities Department
1900 2nd Avenue North
Lake worth, FL 33461
mmorandi@lakeworth.org

PERMIT NUMBER: 138272-202-DWC
ISSUE DATE: 02/02/2016
EXPIRATION DATE: 02/01/2021
COUNTY: Palm Beach
PROJECT NAME: WW Pump Station No. 4 and
Generator Replacement
WASTEWATER TREATMENT: ECR WWRF
FACILITY ID: FL0041360

Dear Ms. Shaner:

This letter acknowledges receipt of your Notification/Application for constructing the previously permitted Domestic Wastewater Collection/Transmission System for the subject project and issuance of a permit under the provisions of Palm Beach County Ordinance No. 97-58. Our Office received the Notice on January 14, 2016.

This is to advise you that the Florida Department of Health Palm Beach County (Department), as the delegated agent of the Florida Department of Environmental Protection, does not object to your use of such general permit and that you are hereby authorized to perform the work shown on the approved plan(s) attached hereto and made a part hereof.

Please note the attached requirements apply to your use of this general permit for constructing the previously permitted domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation will subject the permittee to enforcement action and possible penalties.

Sincerely,
For the Division Director

Darrel J. Grazian, P.E., R.S.
Environmental Administrator – Water Programs Section
Environmental Public Health

DG/JH/KB

c: engineer-of-record: Shampale M. Holland, P.E.
utility: Same
WWTP: Laura Le, P.E.

FDEP General Permit Requirements

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the FDEP Internet site at: <http://www.dep.state.fl.us/water/rulesprog.htm#ww> [62-4.540]
2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. [62-604.600(6)(b)1]
3. This general permit cannot be revised, except to transfer the permit. [62-604.600(6)(b)2]
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. [62-4.030]
5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department FDEP Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: <http://www.dep.state.fl.us/water/wastewater/forms.htm> [62-604.700(2)]
6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. [62-604.700(3)]
7. Abnormal events shall be reported to the Department's in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. [62-604.550]

Palm Beach County Ordinance No. 97-58 Requirements

PBC 1. It shall be the responsibility of the permittee to retain a professional engineer, registered in Florida, to observe that the construction is in accordance with the submitted plans.

PBC 2. This permit does not include construction of any conflict manholes. The construction shall be strictly in accordance with the "Standard Water and Sewer Separation Statement" and other design specifications noted on the engineering plans. If field conditions require deviations from the proposed design, the project engineer shall consult with the Department prior to construction.

PBC 3. Prior to construction, all required permits or approvals must be obtained for all aspects of the project from the appropriate agencies.

PBC 4. Applications for abandonment of all septic systems serving this property must be submitted prior to final approval for use.

APPENDIX B

Boring Logs Report of Geotechnical Exploration

**REPORT OF
GEOTECHNICAL EXPLORATION**

**LAKE WORTH WASTEWATER
PUMP STATION #4 REPLACEMENT (PA #B5018.00)
LAKE WORTH MUNICIPAL GOLF COURSE
LAKE WORTH, FLORIDA**

FOR

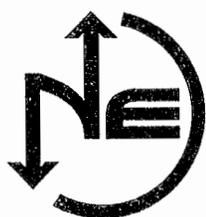
**MOCK ROOS & ASSOCIATES, INC.
5720 CORPORATE WAY
WEST PALM BEACH, FLORIDA 33407**

PREPARED BY

**NUTTING ENGINEERS OF FLORIDA, INC.
1310 NEPTUNE DRIVE
BOYNTON BEACH, FLORIDA 33426**

ORDER NO: 7928.4

JULY 2015



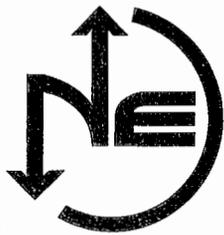
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Geotechnical and Construction Materials | Engineering, Testing and Inspections | Environmental Services

July 7, 2015

Ms. Shampale Holland, P.E..
Mock Roos & Associates, Inc.
5720 Corporate Way
West Palm Beach, Florida 33407
Phone: 561-683-3113 Fax: 561-478-7248
Email: shampale.holland@mockroos.com

Subject: Report of Geotechnical Exploration
 Lake Worth Wastewater Pump Station #4 Replacement
 (PA #B5018.00)
 Lake Worth Municipal Golf Course
 Lake Worth, Florida

Dear Ms. Holland:

Nutting Engineers of Florida, Inc. (NE), has performed a Geotechnical Exploration for the proposed new pump station at the above referenced site in Lake Worth, Florida. This exploration was performed in accordance with the written authorization to proceed provided by Mock Roos & Associates, Inc. dated June 29, 2015. This evaluation was performed to develop limited information regarding subsurface soil conditions at specific test locations which along with proposed construction information provided were used to develop opinions regarding earthwork procedures and foundations for support of the proposed construction. This report presents our findings and recommendations based upon the information examined at the time of this evaluation.

PROJECT INFORMATION

We understand that plans include removal of the existing pump station for the construction of a new pump station. Pump Station #4 is located within the Lake Worth Municipal Golf Course due east of the intersection of North Lakeside Drive and 13th Avenue North in the City of Lake Worth, Florida. The new station structure will be located nearby the present structure location. We were provided aerials indicating the existing pump station and the proposed new pump station at the site. The new station will consist of an eight foot diameter wet well installed to a depth of twenty-four feet.

OFFICES
Palm Beach
Miami-Dade
St. Lucie

An associated a valve vault box, and a new flow meter vault box will also be constructed. We understand that the valve box is planned to be constructed upon a shallow foundation system.

Based on existing site conditions it is estimated that approximately six inches to one foot of material may need to be added to bring the site to final grades; however, the final surface elevation shall be determined by a professional surveyor, civil engineer, or other qualified party.

NE should be notified in writing by the client of any changes in the proposed construction along with a request to amend our foundation analysis and/or recommendations within this report as appropriate.

GENERAL SUBSURFACE CONDITIONS

Soil Survey Maps

As part of the geotechnical exploration, we have reviewed available Soil Conservation Service (SCS) survey maps for Palm Beach County. These SCS maps provide qualitative information about potential general shallow soil conditions in the project vicinity. This information was derived from approximately 6 ft. deep manual auger borings, aerial photo and surface feature interpretation at some point in the past (mid 1980's to early 1970's). The SCS data may or may not reflect actual current site conditions. A review of the Soil Survey for Palm Beach County revealed that at the time the survey was conducted, the soils at the site were described as Arents-Urban land complex. This complex consists of nearly level, somewhat poorly drained, sandy soils and urban land. The soils formed in thick layers of sandy fill material that were placed over low, wet mineral soils to make the areas suitable for urban use. This complex is in the eastern part of the survey area and takes in golf courses, subdivisions, and condominium developments, roadways, business or industrial areas, reclaimed borrow pits, and other areas filled over but not yet developed. We note that the soil surveys were typically penetrated to a depth of approximately six feet.

Subsurface Exploration

NUTTING ENGINEERS OF FLORIDA, INC. was requested to perform one Standard Penetration Test (SPT) boring (ASTM D-1586) to a depth of thirty feet below land surface at the pump station location. We note that due to soft soil conditions limiting truck mounted drill equipment access, the test boring was performed approximately 10 feet east of the requested boring location. The approximate location of the test boring is indicated on the boring location plan presented in the Appendix of this report.

The boring location was identified in the field using approximate methods; namely, a measuring wheel and available surface controls. As such the test boring location should be considered to be approximate.

We note that the upper four feet of the soil profile was manually cleared due to potential underground utilities within the test location. Because of this the relative density of the soil in the upper four feet (N-Value) was not obtained.

Test Boring Result

The test boring location recorded a surface layer of grass and topsoil in the upper four inches underlain by loose to medium dense brown to tan sand and shell to a depth of seven feet. From seven to eleven feet soft to stiff gray organic silt was encountered, underlain by loose to medium dense yellowish brown sand to a depth of twenty-three feet. Below twenty-three feet medium hard tan limestone with sand lenses was encountered to a depth of thirty feet, the maximum depth explored. Please see the enclosed soil classification sheet in the Appendix of this report for additional important information regarding these descriptions, the field evaluation and other related information.

Rock Formation Note

It is possible that weathered rock may exist in this area that may or may not have been recorded in the soil borings for this project. Generally, rock in the area may include limestone or sandstone which has irregularities and discontinuities including vertical and horizontal solution features, varying surface and bottom elevations, and varying degrees of hardness. The rock features may also contain intervening sand and other material filled lenses. The standard penetration test borings executed in this evaluation were performed in accordance with the normal standard of care in this area. Despite this, this process may sometimes fail to detect the presence of rock strata by passing through solution features. Solution features can be very common in rock strata in the area. Also given the brittle nature of some rock strata, rocks may readily shatter when hit by the split spoon. Despite this, these strata may present significant resistance to excavation, driving and/or directional drilling. Said resistance may generate vibrations during excavation which may be perceived to or actually induce settlements in subject nearby structures. Pre and post condition surveys and vibration monitoring would be advantageous in such circumstances.

For these reasons, appropriate due care shall be exercised by contractors performing underground operations in this area, utilizing local experience and test excavations if feasible. Buried debris may or may not be identified or adequately delineated by soil borings. Test pit excavation can provide more insight into such conditions and rock lithology if present. Should additional assurance be desired by the client, further subsurface investigation could be performed.

Laboratory Testing and Results

In order to better evaluate the black silty sand with trace organics, representative soil samples were tested for natural water content and organic content. Specifically, two samples were tested from boring B-1 at depths of seven to eleven feet below existing grade. The results of the testing indicates that the natural water contents ranged from approximately 74 to 117 percent, and the

organic contents ranged from approximately 8 to 19 percent. This indicates the soils are slightly to moderately compressible. In general, soils beneath buildings and roadways should not have more than three to five percent organic material.

Groundwater Information

The immediate groundwater level was measured at the boring locations at the time of drilling. The groundwater level was encountered at approximately three feet below the existing ground surface at the time of drilling.

The immediate depth to groundwater measurements presented in this report may not provide a reliable indication of stabilized or more long term depth to groundwater at this site. Water table elevations can vary dramatically with time through rainfall, droughts, storm events, flood control activities, nearby surface water bodies, tidal activity, pumping and many other factors. For these reasons, this immediate depth to water data **should not** be relied upon alone for project design considerations.

Further information regarding stabilized groundwater elevations at the site could be developed upon specific request. Additional evaluation might include monitoring of piezometers, survey of the project area for evidence of current groundwater elevation influences such as wellfields, obvious construction dewatering, tidal activity, flood control canals and other surface water bodies.

ANALYSIS AND RECOMMENDATIONS

Proposed Wet Well

We anticipate as much as twenty-four feet or more of soil excavation to achieve the proposed base of the pump station. Based on the approximate site elevation at the test boring location, limestone was encountered at a depth of approximately twenty-three feet below the existing grade. We also note that the loose soil conditions encountered in the upper eighteen to twenty feet of the soil profile which may have represented where the split-spoon sampler penetrated through a porous limestone formation. Because of this substantially shallower unrecorded occurrences of rock may be encountered. We also note that the boring was slightly away from the proposed new wet well location, which can also vary the commencing depth of the rock formation. The potential for excavation resistance/difficulty should be expected in rock strata, possibly requiring special equipment.

It is obvious that the wet well and valve boxes will bottom at or below the groundwater table, and therefore dewatering may be required depending on the method of installation. Alternatively, construction in the "wet" may be feasible subject to evaluations performed by other qualified, experienced personnel. The contractor is responsible for the design and other issues that may pertain to dewatering, or alternatively for procedures of constructing without dewatering. We

note that groundwater elevations are subject to tidal and other variations. The borings performed for this project revealed the soils in the influence zone of the foundations for the pump station are suitable for support of the pump station. It is our opinion that the weight of the excavated soil will somewhat compensate the pump station foundation loads; therefore, we anticipate the foundations will be subjected to short term settlements of less than approximately one inch. The design of the wet well will need to consider hydrostatic forces since the water table is approximately three feet below the existing ground surface.

If during excavation deleterious soils are encountered, we recommend that any unsuitable material be removed within the area of the pump station and replaced with clean structural fill. Discussions should be held with interested parties to effectively determine the suitability of this material.

Proposed Pump Station Utility Connections

Based on the borings performed for this project, it is our opinion that the pump station may be supported on the existing in place soils. During the excavation process, any questionable soils or latent rock concerns encountered should be evaluated by a representative of Nutting Engineers.

Based on the borings performed for this project, it appears that an unsupported vertical cut is not considered stable or safe during construction. An unsupported excavation may cause the collapse of the sidewalls when workmen are in the excavations. An excavation collapse can also damage the formwork and/or steel for the proposed structure as it is being constructed. Therefore, in our opinion and following the current regulations established by OSHA for excavations, cut slopes are required in absence of proper shoring. If slopes cannot be maintained, then the excavation must be cased or shored. Shoring procedures should conform to those presented in the Occupational Safety and Health Administration (OSHA) standards.

Proposed Valve Boxes

The boring performed for this project noted the presence of a soft organic silt soil exists from seven to eleven feet below existing grade. We also understand that the valve box structures are desired to be constructed using a shallow foundation system. These features may be constructed on a shallow foundation system, however due to the soft organic stratum a potential for differential settlements exists and some regrading may be necessary in the future.

Because the depth and thickness of the organic soils vary within the site, settlement amounts can vary from west to east. The client should be made aware of this settlement potential and the probability that an increased frequency of maintenance may be required.

If a shallow foundation system is used, once the foundation soils have been prepared with the recommendations presented in this report, the proposed valve box features may be constructed using a shallow foundation system with a maximum soil bearing pressure of 2,000 pounds per square foot. We recommend a minimum width of 24 inches for continuous footings, even though the soil bearing pressure may not be fully developed in all cases. The footings should be well

reinforced with steel bars to reduce the potential for differential settlements. We recommend that the bottom of footings be at least 12 inches below the lowest adjacent finished grade.

Site Preparation-Valve Box

The surficial organic soils, debris from the clearing operations, and any unsuitable soils as determined by the Geotechnical Engineer will need to be completely removed within the construction area and to a lateral distance of at least 5 feet beyond the footprint limits and potentially further based upon depth. A Nutting Engineer's representative should be present to observe that the stripping operations are performed as we have discussed herein.

When this has been completed the valve box area should be excavated. The water table will need to be maintained at least two feet below the bottom of excavation. The bottom of foundation excavations should then be compacted after excavation to develop a minimum density requirement of 98 percent of the maximum modified Proctor dry density, for a minimum depth of one (1) foot below the bottom of the footing depth, as determined by field density compaction tests.

Alternate Valve Box Foundation Preparation: Due to groundwater concerns, compaction of the valve box foundations may be difficult. If approved by the project civil engineer, in order to prepare the foundations for the proposed valve boxes, we recommend that within the footing limits, at least 12 inches of soil be over excavated and replaced with Department of Transportation (DOT) number 57 stone or equivalent. The stone should be uniform in size and mixing of different materials should not be performed.

Once the stone has been placed, a small vibratory compactor should compact the stone in place to ensure that the placed stone is tightly packed in the bottom of footings. During the performance of this some localized dewatering may be necessary in order to properly prepare the site for construction. Prior to any placement of concrete, the footing area must be relatively dry with no standing water.

Dewatering

The immediate groundwater was encountered at a depth of three feet below the existing ground surface at the time of the test boring. As stated previously the contractor is responsible for the design, maintenance, and other factors related to dewatering and groundwater control. We note that where density tests are needed the groundwater level should be maintained at least two feet below the bottom of the excavations so that adequate compaction and density tests can be performed.

Below Grade Walls

The walls of the pump station below the existing grade should be designed to resist earth pressures from granular backfill, surcharge loads and unbalanced hydrostatic forces. An equivalent fluid having a unit weight of 60 pcf can be used to calculate the lateral pressure imposed by the fill against the wall. Assume that the wall will not translate or rotate sufficiently to mobilize the “active” earth pressure condition, therefore, assume the “at rest” condition will prevail. A K_o of 0.5 can be used for design.

The walls should be designed to sustain water with a pressure head at the appropriate design flood elevation. Slab or other load carrying element loads must be included in the design of the walls.

Backfill below on grade walls should be approved sand fill and should be placed in loose lifts not exceeding 12 inches in thickness and should be compacted to minimum dry density between 92% and 95% of the maximum modified Proctor dry density. Overcompaction in these areas should be avoided.

TABLE OF GENERAL SOIL PARAMETERS

SOIL DESCRIPTION	SOIL UNIT WEIGHT (PCF)		ANGLE OF INTERNAL FRICTION (DEGREES)	EARTH PRESSURE COEFFICIENT	
	SATURATED	SUB-MERGED		ACTIVE (Ka)	PASSIVE (Kp)
Very Loose Sand	110	48	28	2.8	0.36
Loose Sand	115	53	30	3	0.33
Medium Dense to Dense Sand	120	58	32	3.25	0.31

We note that the values in the table are based on visual classification and if more exact values are needed, specific laboratory testing should be performed. Also, the depths of the soils were not included since the depths of each stratum vary. Also, appropriate factors of safety should be applied by the design engineer depending on the application. We are available to assist in the design process if needed.

Trench Excavations

Excavations of five feet or more will need to be sloped or shored in accordance with State of Florida and OSHA recommendations. It is our opinion that if the excavation remains dry, temporary side slopes of 3 horizontal to 1 vertical may be used for this project. Where existing utilities, roadways or other obstructions prevent sloping the soils, shoring will be required. Where temporary shoring will be required, the table should be used for earth pressure determinations.

GENERAL INFORMATION

Our client for this geotechnical evaluation was:

Ms. Shampale Holland, P.E..
Mock Roos & Associates, Inc.
5720 Corporate Way
West Palm Beach, Florida 33407

The contents of this report are for the exclusive use of the client and the client's design team for this specific project exclusively. Information conveyed in this report shall not be used or relied upon by other parties or for other projects without the expressed written consent of Nutting Engineers of Florida, Inc. This report discusses geotechnical considerations for this site based upon observed conditions and our understanding of proposed construction for foundation support. Environmental issues including (but not limited to), soil and/or groundwater contamination are beyond our scope of service for this project. As such, this report should not be used or relied upon for evaluation of environmental issues.

Benefit may be realized by the performance of exploratory test pits on the site to develop additional subsurface information. The client may wish to consider performance of test pits on this project to supplement information already developed.

Prior to initiating compaction operations, we recommend that representative samples of the structural fill material to be used and acceptable in-place soils be collected and tested to determine their compaction and classification characteristics. The maximum dry density, optimum moisture content, gradation and plasticity characteristics should be determined. These tests are needed for compaction quality control of the structural fill and existing soils, and to determine if the fill material is acceptable.

If conditions are encountered which are not consistent with the findings presented in this report, or if proposed construction is altered or moved from the location investigated, this office shall be notified immediately so that the condition or change can be evaluated and appropriate action taken.

The vibratory compaction equipment may cause vibrations that could be felt by persons within nearby buildings and could potentially induce structural settlements. Additionally, preexisting settlements may exist within these structures that could be construed to have been caused or worsened by the proposed vibratory compaction after the fact.

Pre- and post conditions surveys of these structures along with the vibration monitoring during vibratory compaction could be performed to better evaluate this concern. The contractor should exercise due care during the performance of the vibratory compaction work with due consideration of potential impacts on existing structures. If potential vibrations and impacts are not considered tolerable, then alternate foundation modification techniques should be considered.

Nutting Engineers of Florida, Inc. shall bear no liability for the implementation of recommended inspection and testing services as described in this report if implemented by others. Nutting has no ability to verify the completeness, accuracy or proper technique of such procedures if performed by others.

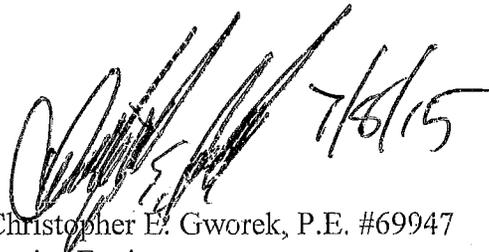
The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been presented after being prepared in accordance with general accepted professional practice in the field of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

We appreciate the opportunity to provide these services for you. If we can be of any further assistance, or if you need additional information, please feel free to contact us.

Sincerely,
NUTTING ENGINEERS OF FLORIDA, INC.



Richard C. Wohlfarth, P.E.
Director of Engineering



Christopher E. Gworek, P.E. #69947
Senior Engineer

Attachments: Boring Location Plan
Test Boring Report
Limitations of Liability
Soil Classification Criteria

REP MOCK ROOS LAKE WORTH PUMP STATION 4 CEG



- LEGEND -

 APPROX. TEST LOCATION

Mock Roos & Associates, Inc.
Lake Worth Pump Wastewater Pump Station #4
 Lake Worth Municipal Golf Course, 1 7th Avenue North
 Lake Worth, Florida

PROJECT NO. 7928.4

NUTTING ENGINEERS
 OF FLORIDA, INC.
 ESTABLISHED 1967

APPROXIMATE
 TEST LOCATION
 PLAN

GEOTECHNICAL EXPLORATION
 — Not to Scale —

FIG. 1



1310 Neptune Drive
 Boynton Beach, FL, 33426
 Telephone: 561-736-4900
 Fax: 561-737-9975

BORING NUMBER B-1

PAGE 1 OF 1

CLIENT Mock Roos & Associates, Inc. PROJECT NUMBER 7928.4
 PROJECT NAME Lake Worth Wastewater Pump Station #4
 PROJECT LOCATION Lake Worth Municipal Golf Course, 1 7th Avenue North, Lake Worth, Florida

DATE STARTED 7/1/15 COMPLETED 7/1/15 SURFACE ELEVATION REFERENCE Approx. @ Road Crown
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:
 LOGGED BY T. Lovett CHECKED BY C. Gworek AT TIME OF DRILLING 3.0 ft
 APPROXIMATE LOCATION OF BORING 10' E. of proposed boring location

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL	MC	LL	
						20	40	60	80
						□ FINES CONTENT (%) □			
						20	40	60	80
0		TOPSOIL 2" Lt. brown fine SAND, trace shell	AU 1						
		Tan fine SAND and SHELL	AU 2						
5		Gray SILT	SS 3	5-6-6-7	12				
		Gray SILT	SS 4	3-3-3-3	6				
		Gray SILT	SS 5	5-8-9-11	17				
10		Yellowish brown fine SAND	SS 6	8-9-10-11	19				
		Yellowish brown fine SAND	SS 7	4-5-5-5	10				
15									
			SS 8	3-4-4-3	8				
20									
		Lt. gray LIMESTONE and SAND	SS 9	10-9-11-10	20				
25									
			SS 10	12-10-12-11	22				
30		Bottom of hole at 30.0 feet.							

LIMITATIONS OF LIABILITY

WARRANTY

We warrant that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. **No other warranties, expressed or implied, are made.** While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. **Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

CONSTRUCTION OBSERVATION

Construction observation and testing is an important element of geotechnical services. The geotechnical engineer's field representative (G.E.F.R.) is the "owner's representative" observing the work of the contractor, performing tests and reporting data from such tests and observations. **The geotechnical engineer's field representative does not direct the contractor's construction means, methods, operations or personnel.** The G.E.F.R. does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The G.E.F.R. is responsible for his/her safety, but has no responsibility for the safety of other personnel at the site. The G.E.F.R. is an important member of a team whose responsibility is to observe and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications. The enclosed report may be relied upon solely by the named client.

SOIL AND ROCK CLASSIFICATION CRITERIA

SAND/SILT

N-VALUE (bpf)	RELATIVE DENSITY
0 - 4	Very Loose
5 - 10	Loose
11 - 29	Medium
30 - 49	Dense
>50	Very dense
100	Refusal

CLAY/SILTY CLAY

N-VALUE (bpf)	UNCONFINED COMP. STRENGTH (tsf)	CONSISTENCY
<2	<0.25	v. Soft
2 - 4	0.25 - 0.50	Soft
5 - 8	0.50 - 1.00	Medium
9 - 15	1.00 - 2.00	Soft
16 - 30	2.00 - 4.00	v. Stiff
>30	>4.00	Hard

ROCK

N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
$N \geq 100$	Hard to v. hard	Local rock formations vary in hardness from soft to very hard within short vertical and horizontal distances and often contain vertical solution holes of 3 to 36 inch diameter to varying depths and horizontal solution features. Rock may be brittle to split spoon impact, but more resistant to excavation.
$25 \leq N \leq 100$	Medium hard to hard	
$5 \leq N \leq 25$	Soft to medium hard	

PARTICLE SIZE

Boulder	>12 in.
Cobble	3 to 12 in.
Gravel	4.76 mm to 3 in.
Sand	0.074 mm to 4.76 mm
Silt	0.005 mm to 0.074 mm
Clay	<0.005 mm

DESCRIPTION MODIFIERS

0 - 5%	Slight trace
6 - 10%	Trace
11 - 20%	Little
21 - 35%	Some
>35%	And

Major Divisions	Group Symbols	Typical names	Laboratory classification criteria			
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (Appreciable amount of fines)	GW*		Poorly graded gravels, gravel-sand mixtures, little or no fines	
			d			Silty gravels, gravel-sand-silt mixtures
			u			
	GC	Clayey gravels, gravel-sand-clay mixtures				
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines		
			SP	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (Appreciable amount of fines)	SM*	Silty sands, sand-silt mixtures		
			d			
			u			
SC			Clayey sands, sand-clay mixtures			
Fine-grained soils (More than half of material is smaller than No. 200 sieve size)	Silt and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity			
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
		OL	Organic silts and organic silty clays of low plasticity			
	Silt and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
		CH	Inorganic clays of high plasticity, fat clays			
		OH	Organic clays of medium to high plasticity, organic silts			
		PT	Peat and other highly organic soils			
	Highly organic soils					

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than five percent.....GW, GP, SW, SP
 More than 12 percent.....GM, GC, SM, SC
 5 to 12 percent.....Borderline cases requiring dual systems#

Laboratory classification criteria

$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3

Not meeting all gradation requirements for GW

Atterberg limits below "A" line or P.I. less than 4

Atterberg limits above "A" line with P.I. greater than 7

Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.

$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3

Not meeting all gradation requirements for SW

Atterberg limits below "A" line or P.I. less than 4

Atterberg limits above "A" line with P.I. more than 7

Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual system.

Plasticity Chart